Annual Progress Report

For the

Texas Water Development Board

Agriculture Water Conservation Demonstration Initiative

Harlingen Irrigation District CC 1

Maximization of On-Farm Surface Water Use Efficiency by Integration of On-Farm Application and District Delivery Systems

Submitted by:
Harlingen Irrigation District
Cameron County #1
Wayne Halbert General Manager
Harlingen, TX

February 28th, 2007

Table of Contents

Appendices

1. Executive Summary

The Harlingen Irrigation District-Cameron County No. 1, under the auspices of a grant from the Texas Water Development Board, is sponsoring the *Agricultural Water Conservation Demonstration Initiative (ADI)*, a multi-year project to conduct a study of the maximization of on-farm surface water use efficiency by integration of on-farm application and district delivery systems. The ten-year project includes participation by Harlingen Irrigation District Cameron County No. 1, Delta Lake Irrigation District, Texas A & M University-Kingsville, USDA-Natural Resources Conservation Service, Rio Farms, Inc, Texas Cooperative Extension Service and agricultural producers in Cameron, Hidalgo and Willacy counties. This Project proposes to assist in the implementation of the agricultural water conservation management strategies, as identified in the Region M Approved Regional Water Plan and the Texas State Water Plan and will further agricultural water conservation in Texas. The project supplements on-going conservation efforts in the Lower Rio Grande Valley

The District has formed an advisory committee consisting of growers, demonstration co-operators, scientists and representatives of grower organizations. The primary responsibilities of this committee are to offer guidance and perspective to the project as a whole. The committee meets on a quarterly basis to discuss the progress and goals of the project. Our hopes are for this committee to become one of the main conduits for disseminating information to the growers of the Rio Grande Valley.

1.1. Advisory Committee Members

Chris Allen – Cooperator
Leonard Simmons – Cooperator
Edward Bauer – Grower
Sam Morrow – Cooperator
Harold Siever - Cooperator
Troy Allen – Delta Lake Irrigation District Manager
Ray Prewitt – Texas Citrus Mutual
Dr.. Shad Nelson – Texas A&M Kingsville
Dr. Juan Enciso – Texas A&M Extension Service
Dr. Al Blair – Axiom-Blair Engineering
Dr. Steven Klose – Texas Cooperative Extension
Terry Lockamy – Texas Cooperative Extension
Enrique Perez – Cameron County Extension
Dean Santisteven – NRCS
Andy Garza – TSSWCB

2. Introduction

This report contains the annual update and progress made in the Agricultural Demonstration Initiative Project as indicated in the Scope of Work of the Contract between Harlingen Irrigation District – Cameron County No. 1 (HIDCC1 or the District) and the Texas Water Development Board (TWDB). A description of the overall progress, problems encountered delays in the timely completion of work, or change in the deliverables or objectives of the contract are discussed; as well as any corrective actions necessary.

Late in 2006 the advisory committee agreed that to better maintain anonymity of the cooperators information the demonstration sites would be assigned alpha numerical designations rather than be listed by grower name. This was done to help encourage participation by those growers who are reluctant to report yield, water use, and financial information about demonstration sites. From this point forward all demonstration sites will be referred to by site number. The site designation numbers are defined below:
The first digit designates the entity responsible for the site. The second digit designates the grower. The third digit designates the field within the demonstration site. The entity designations are: 0 and 1 Texas A&M University Kingsville Dr. Shad Nelson, 2 and 3 Texas A&M Extension Dr Juan Enciso, 4 and 5 Harlingen Irrigation District.

3. Scope of Work

3.1. Subcontracting Contract Execution

The primary responsibilities for this task were contracted to Axiom-Blair Engineering. The subcontracts with Delta Lake Irrigation District, Texas A&M University Kingsville, Texas Cooperative Extension, and others to provide support and services to perform the work tasks listed below were completed for 2006 and work for the reissue of those contracts for 2007 is underway. This task is scheduled to be complete in March of 2007.

3.2. District and On-Farm Flow Meter Calibration and Demonstration Facilities

Appendix "E" contains a detailed account of the construction activity.

The District contracted the engineering and design for this facility to Axiom-Blair Engineering and a detailed report of this contract is located in appendix "F".

3.3. District Dispatch and Irrigation Delivery Scheduling

This task is scheduled to begin in 2007.

3.4. On-Farm Flow Measurement Data Collection

Delta Lake Irrigation District has been contracted to perform the task of manual meter information collection. A detailed account of the collection methods and data is located in appendix “A”. This information will be compared with the Harlingen Irrigation District’s automated meter and telemetry system. The telemetry system to monitor deliveries of irrigation water through out the District was completed in late 2006. We will begin the comparison after the District has had ample time to evaluate its system and is confident in the data it provides.

3.5. District Facilities and Policies Required to Support On-Farm Water Conservation

This task scheduled to begin in 2007.

3.6. Economic Evaluation of Demonstrated Technologies

A significant component of the demonstration project is the economic evaluation of each on farm technology. The District contracted Texas Cooperative Extension service to perform this task through its FARM Assist program. Economic summaries of each site are included in the Demonstration Site Summary Report for sites that economic analysis has been completed. A more detailed report of the first year’s evaluation, as submitted by Dr. Steven Klose, is located in appendix “B”.

3.7. Demonstration of Internet Based Information Real-Time Flow, Weather, and Water User Accounting System

The bulk of this task is being performed by Axiom-Blair Engineering. The design and launch of the District’s web page occurred in September of 2005. The web page allows us to publish information regarding demonstration sites as well as weather and irrigation water usage. A more detailed report of this task, as submitted by Axiom-Blair, is located in appendix “F”.

3.8. Drip and Furrow Flood Irrigation in Annual Crops and Multi Year Crops

The majority of this task has been subcontracted to Texas A&M University - Kingsville under the direction of Dr. Shad Nelson. Dr. Nelson and his staff have been working since last spring to establish demonstration sites throughout the Valley. Dr. Nelson has also been working closely with Texas A&M Extension Service and Dr. Juan

Enciso. Dr. Nelson has been sharing resources and gathering data on sites established by Dr. Enciso. A summary report of all the sites associated with this scope of work is located in appendix C.

3.9. Surge, Automated Surface, and Precision Surface Irrigation

The District has maintained the following demonstration sites through out the 2006 growing season; 5 surge, 2 surface flood, and 1 subsurface low pressure drip. All of these sites will continue through the 2007 growing season.

A summary of the HID sites is located in Appendix D.

3.10. LESA/LPIC/LEPA Center Pivot Sprinkler Demonstration Sites

The District has two LESA center pivot sites. The first site is located at Rio Farms and has been in spring cotton, fall corn rotation for several years. Soil moisture is monitored during each of the growing seasons and irrigation water is measured with a McCrometer meter located on the center pivot. This site is scheduled to be planted in soybeans in the 2007 spring season.

The second site is a pasture irrigated with a mini-pivot. This pasture is divided into four separate pastures and the mini pivot is moved to each section for the duration of the irrigation. We monitor moisture in each pasture and the water is metered at the pumping site with a McCrometer meter. This pasture is used for a cow calf operation. This site demonstration was terminated in 2006 due to the replacement of the irrigation system. The grower installed a K-Line sprinkler system in place of his mini-pivot. We are currently determining the best method to monitor and demonstrate this irrigation system.

3.11. Automated and Manual On-Farm Measurements Systems

The District is in the process of installing a multi-million dollar automated meter and telemetry system that will allow for the monitoring and reporting of all water deliveries in the District. Upon completion of this installation in late 2006 the District will begin monitoring and reporting flows for evaluation purposes. Real time flow data will be made available to growers on the District’s web site. The cost and efficacy of the automated collection of flow data with in the District will be compared to the manual collection taking place in the Delta Lake Irrigation District. This evaluation is expected to take place over several years and the results of this evaluation are not expected to be available until the evaluation process is complete.

3.12. Variable Speed Pump Control and Optimization of Delivery of On-Farm Demands

Delta Lake Irrigation District has installed three diesel driven pumps to supply water to a service canal. As part of their revised 2006 contract, Delta Lake Irrigation District will provide the hardware and Harlingen Irrigation District has contracted Axiom-Blair to provide engineering and design for the variable speed and control component of this project. A more detailed report of this task is included in the Delta Lake annual report in Appendix “A”.

3.13. Field Demonstrations of Projects/ Field Days


LBB Tour of Surge site

In March of 2006 the Harlingen Irrigation District hosted representatives of the Texas Water Development Board and the Legislative Budget Board for a tour and progress presentation of the project. The presentation consisted of approximately one hour of project updates and information from every aspect of the project followed by a three hour tour of the demonstration sites and the Flow Meter Calibration Facility construction area.

In July of 2006 the Harlingen Irrigation District hosted representatives from the Texas Alliance for Water Conservation project in Lubbock Texas. The District presented information about the ADI project followed by a tour of the demonstration sites as well as many other farming interests across the Rio Grande Valley.

TAWC Tour of Pollock Farms and Sharyland Orchards

3.14. Workshops

The Harlingen Irrigation District has conducted many water related workshops through out the last year. In March of 2006 the District hosted the EPANET short course. This course was taught by Dr. Al Blair and included hands on training of the EPANET software and its usefulness in the design and installation of pipelines and pumps. The course participants were primarily engineers and representatives of irrigation districts throughout the Rio Grande Valley. In April of 2006 the District hosted its first Water Management workshop. This workshop was taught by Dr. Juan Enciso of TAMES and Dean Santisteven of USDA-NRCS. This course was used to introduce and teach water management techniques to growers and other water users. The information was based on the USDA requirements for participation in the EQIP Water Management payment incentive. In addition to hosting workshops the Harlingen Irrigation District has participated in many EQIP information meetings throughout 2006.


EPANET Workshop

The District will be hosting its second Water Management Workshop in February 2007 as well as participating in the Water Management/Canal Management workshop hosted by TAMES Dr. Guy Fipps.

3.15. Presentations at Water Conservation Meetings

The Harlingen Irrigation District made a presentation on the ADI project to the Texas Water Conservation Association in March of 2006. The district was able to convey the importance of the ADI project to the Rio Grande Valley and present some of the technologies being used in the District to encourage water conservation.

In November of 2006 the Harlingen Irrigation District along with Axiom-Blair Engineering occupied a booth at the 27th Annual Irrigation Show. A slide show and poster were presented and pamphlets summarizing the ADI project were handed out.

Project presentations were made at the Texas Citrus Association and the Texas Vegetable Association annual meetings.

.

The District has published three news letters highlighting the Agricultural Water Conservation Demonstration Initiative and related topics. This news letter has been distributed to over seven hundred recipients across the state of Texas. Our goal is to publish the newsletter on a quarterly basis and use it as one of the conduits for disseminating information to the growers of the Rio Grande Valley as well as other interested parties across the state.

A fact sheet was created to introduce the ADI project to growers and agriculture leaders. This fact sheet was distributed at water conservation meetings, cotton gins and irrigation districts.

3.16. Quarterly Progress Report

Harlingen Irrigation District has completed and filed three quarterly progress reports and associated reimbursement requests.

3.17. Program Administrative Work

Harlingen Irrigation District has maintained the accounting records and files for the ADI project. The project's primary administration is handled by Tom McLemore the Project Manager. Together, with the Irrigation District's General Manger Wayne Halbert, we have issued and maintained subcontracts with Texas A&M University - Kingsville, Delta Lake Irrigation District, Texas Cooperative Extension and Axiom-Blair Engineering.

3.18. Report Preparation, Reproduction, and Distribution

The district has completed and filed three quarterly progress reports and the respective reimbursement request. The District has also completed their second annual report, reproduced and filed it with the Texas Water Development Board.

4. Financial Report by Task

TASK	TWDB	TWDB	Matching Funds				Source
	Feb 1, '05 Feb 15, 06	Feb 15, 06 Feb 28, 07	2003	2004	2005	2006	
A- Project Subcontracting							
Subcontracting Contract Execution	$6,710.00	$3,525.00					
Total A- Project Subcontracting	**$6,710.00**	**$3,525.00**					
B-Technical Management Support for Demos						$2,799.80	HID
District and On-Farm Flow Meter Cal	$143,528.71	$346,379.15			$20,000.00		
On-Farm Flow Meas. Data Collection			$123,608.59	$175,842.95	$214,098.25	$108,845.20	HID/BOR
					$115,671.10	$259,496.69	HID/2025
				$4,220.00	$271,839.73	$144,616.13	BOR/2025
	$9,990.62	$14,646.69		$376,981.31	$17,254.62		NADB
Dist Facilities and Policies	$116.26						
Economic Eval of Demo Tech FARM ASSIST	$1,656.21	$55,526.47					
Technical Management Support for Demos -Admin	$26,664.82	$31,207.69					
Total B-Technical Management Support for Demos	**$181,956.62**	**$447,760.00**	**$123,608.59**	**$557,044.26**	**$638,863.70**	**$515,757.82**	
C-Demonstration Projects						$6,214.70	HID
Demo of Internet Based Information	$14,862.15	$84,856.66			$3,323.00		ABE
					$2,267.30	$4,250.00	NETAFIM
					$5,283.00		EQIP
On Farm Drip,Flood,and Surge Demo	$44,298.78	$54,027.00			$24,095.00	$21,840.00	TAMUK
VS Pump Control and Optimization		$7,640.93				$131,102.31	DLID
Demonstration Projects - Admin	$19,822.96	$65,615.71					
Total C-Demonstration Projects	**$78,983.89**	**$212,140.30**			**$34,968.30**	**$163,407.01**	
D- Public Field Days and Demonstrations							HID
Presentations at Water Con. Meetings	$3,161.97	$995.76					
Total D- Public Field Days and Demonstrations	**$3,161.97**	**$995.76**					
E-Project Administration and Report Prep					$121,498.53	$148.49	HID
Program Administrative Work	$57,710.25	$21,461.66					
Report Prep. Repro. and Distribution	$3,021.58	$1,726.64					
Project Administration and Report Prep - Admin	$16,287.98	$21,258.16					
Total E-Project Administration and Report Prep	**$77,019.81**	**$44,446.46**			**$121,498.53**	**$148.49**	
Sub total by Year	**$347,832.29**	**$708,867.51**	**$123,608.59**	**$557,044.26**	**$795,330.53**	**$679,313.32**	
Total Matching Funds	**$1,475,983.38**	**$679,313.32**	**$2,155,296.70**				
Project Total by Year	**$1,823,815.67**	**$1,388,180.83**					

Annual Progress Report

For the

Texas Water Development Board - Agricultural Water Conservation Demonstration Initiative Grant

Maximization of On-Farm Surface Water Use Efficiency by Integration of On-Farm Application and District Delivery Systems

On-Farm Flow Measurement Data Collection

Delta Lake Irrigation District

Submitted by
Delta Lake Irrigation District
General Manager:
Troy Allen

Appendix "A"

Executive Summary

The Delta Lake Irrigation District (DLID) has been monitoring on farm irrigation sites via manual meter readings for the last several years. These sites encompass a variety of crops including, but not limited to carrots, onions, sugar cane, cotton, grain, citrus, and pastures. Now, together with the ADI Project DLID has collected data to help determine the cost effectiveness of manual meter reading as compared to the automated system used in Harlingen.

Scope of Work

The Delta Lake Irrigation District (DLID) has been monitoring on farm irrigation sites via manual meter readings for the past seven years. These sites encompass a variety of crops including, but not limited to carrots, onions, watermelons, cabbage, sugar cane, cotton, grain, citrus, and pastures. Now, together with the ADI Project DLID has collected data to help determine the cost effectiveness of manual meter reading as compared to the automated system used in Harlingen. Data collected consists of Field ID, Grower Name, Start and Ending Times, Dates, and Meter Readings, Hours of Irrigation, Gallons per Minute, and Total Acre-Feet.

After collection and tabulation of the data, the numbers can be used to calculate information vital to the efficiency and well being of the water district.

There are a variety of meters that the field technician must become accustomed to reading. Some meters use acre-feet, and some use gallons as their unit of measure. Another challenge faced by the meter reader is to locate the meter, which can vary from field to field. For example, Pictures 1 and 2 For example, Pictures 1 and 2 show a meter that is affixed in the most common location, near the valve. Pictures 3, and 4 however illustrate a meter that has been affixed to the top of a drip pump filtration system, on which the meter reader must climb on top of to get the daily readings.

Picture 1

Picture 2

Picture 3

Picture 4

Picture 5

Picture 6

Pictures 5 shows the meter installed on a permanent drip pump site. Picture 6 is a meter installed on to of a pipeline incased in a concrete pipe for protection. An example of a meter that measures in acre-feet can be seen in picture 7

Picture 7

Pictures 8 and 9 demonstrate the progression of the watering process in a cabbage field. Picture 8 is in the early morning when the farmer began watering and picture 9 is in the afternoon approximately 6 hours after the water was started. Pictures 1 and 2 show the meter setup used for flood irrigation in this cabbage field.

Picture 8

Picture 9

A major step in the evaluation of manual meter readings vs. automated systems is the budget. Without this, it would be impossible to compare and contrast the validity of the opposing methods.

One field technician can efficiently read 5 to 7 meters per hour with an average of 5 to 8 miles per meter. Once a week the technician will input the data collected from the daily readings… this will generally take 1 to 3 hours depending on the number of sites that are in operation.

The District will generally have 40 to 80 meters running under normal irrigation, which can be handled by the technician and canal riders for backup if needed. When heavy irrigation starts we have to add technicians to read the additional meters, which in the past has been as many as 230 meter running at one time, this usually last for a few weeks at a time, two to three times a year. We have determined a cost of $6.50 to $8.00 per meter to read the meter and input the data in to the system.

Below is an example of the data collected on three different crops during irrigation.

9and10Blk3
Meter # 99-7915-5
Ticket#61200158
72Acres 60% of field watered = 43 Acres
Cantaloupe

DATE	*Start Time*	*Start Reading*	*End Time*	*End Reading*	**GPM**	*Ac/Ft*	*Gallons*	*Inches*	*Info*
1/19/2007	10:30A.M.	148.141			300				
1/20/2007	9:54A.M	151.631			300				
1/21/2007	8:38A.M.	153.183			300				
1/22/2007	2:55P.M.	155.926			300				
1/23/2007			3:00P.M.	157.186	300	9.045	2947322	2.52	

15 of 67 MTL&I
Meter: 99-9980-6
Crop: Watermelon
25 Acres 60% of field watered = 15 Acres

3/11/2006	7:00 AM	835.827							
3/13/2006			1:00PM	836.986		1.159	377660.1	0.927206	test drip
3/29/2006	9:00 AM	839.986							
3/29/2006	3:00 PM	840.132			125				
3/30/2006	3:00 PM	840.717			150				
3/31/2006	11:00 AM	841.224			150				
4/2/2006			2:00PM	843.686		3.722	1212814	2.977618	

8 of 91 MTL&I
Meter: 99-5634-G
Crop: Open/ Corn
Acres: 34.02

DATE	Start Time	Start Reading	End Time	End Reading	GPM	Ac/Ft	Gallons	Inches	Info
2/21/2006	7:00AM	0163.55			1900				
2/22/2006	9:30 AM	0176.99			1900				
2/23/2006	9:30AM	0184.72			1900				
2/24/2006	11:00AM	0189.86			1900				
2/26/2006			5:00 PM	0198.31		34.76	11326546	12.26	
4/18/2006	8:00AM	0449.25			Off				
4/19/2006	8:00AM	0453.49			1700				
4/20/2006	8:00AM	0461.33			1600				
4/22/2006			4:30 PM	0470.71		21.46	6992741	7.57	

Another part of our project was for the District to set up a Variable Speed Pump Site. The District has installed the pumps and motors for Re-lift Station No. 45 (the Variable Speed Pump Site), as well as the security fencing and trash rake. This site will ultimate be equipped with automatic start, shutdown, remote throttle control and any other hardware necessary to provide remote control of these pumps. The components for total automation will be ordered within the upcoming months. The District's expense to-date for the Variable Speed Pump System is $131,102.26. This expense is for the Pumps, Motors, security fence and trash rake.

The District is in the process of ordering all the components to complete the Variable Speed Pump project. The pumps are installed and currently in service. We hope to get the automated system online within the next few months. Below are pictures of the Pumps and Motors.

The above pictures were taken shortly after installation; we have since finished the catwalk and painting.

Listed below are two examples of mileage readings for FY 2006. All meter readings are attached in an Excel spreadsheet.

March, 2006

Date	Daily Beginning	Daily End	ADI Mileage	DLID Mileage
3/1/2006	17141	17224.7	63.8	19.9
3/2/2006	17224.7	17376.7	89.7	62.3
3/3/2006	17376.7	17491.3	77.8	36.8
3/4/2006	17491.3	17544.5	27.6	25.6
3/5/2006	0	0		
3/6/2006	17544.5	17691.5	89	58
3/7/2006	17691.5	17811.6	86.1	34
3/8/2006	17811.6	17932.7	88.9	32.2
3/9/2006	17932.7	18076	77.9	65.4
3/10/2006	18076	18221.4	87.3	58.1
3/11/2006	0	0		
3/12/2006	18221.4	18330.1	69	39.7
3/13/2006	18330.1	18473.9	79.5	64.3
3/14/2006	18473.9	18600.5	88.9	37.7
3/15/2006	18600.5	18743.1	98.5	44.1
3/16/2006	18743.1	18890.9	99.6	48.2
3/17/2006	18890.9	19007.9	75	42
3/18/2006	0	0		
3/19/2006	19007.9	19118.2	85.3	25
3/20/2006	19118.2	19200.1	65	8.1
3/21/2006	19260.1	19447.7	135	52.6
3/22/2006	19447.7	19577.7	85	45
3/23/2006	19577.7	19737.3	95.6	64
3/24/2006	19737.3	19884.9	85	62.6
3/25/2006	0	0		
3/26/2006	19884.9	20012.3	86	41.4
3/27/2006	20012.3	20137.1	70	54.8
3/28/2006	20137.1	20259.8	59	63.7
3/29/2006	20259.8	20405.7	76	69.9
3/30/2006	20405.7	20539.8	45	89.1
3/31/2006	20539.8	20665.7	64.5	61.4
		3524.7	2150	1374.7
		Total Miles	ADI Miles	DLID Miles

April, 2006

Date	Daily Beginning	Daily End	ADI Mileage	DLID Milage
4/1/2006	20665.7	20754.7	89	
4/2/2006	0	0	0	0
4/3/2006	20754.7	20876.9	47.5	74.7
4/4/2006	20876.9	21026.8	61.7	74.2
4/5/2006	21026.8	21167.8	68.8	72.2
4/6/2006	21167.8	21295.5	65.3	48.4
4/7/2006	21295.5	21418.9	52	57.4
4/8/2006	21418.9	21557.6	138.7	
4/9/2006	0	0	0	0
4/10/2006	21557.6	21694.5	61.6	61.3
4/11/2006	21694.5	21848.2	99.4	40.3
4/12/2006	21848.2	22012.9	98.6	52.1
4/13/2006	22012.9	22133.4	96	10.5
4/14/2006	22133.4	22215.5	82.1	
4/15/2006	0	0	0	0
4/16/2006	0	0	0	0
4/17/2006	22215.5	22324.9	94.3	1.1
4/18/2006	22324.9	22491.4	105	47.5
4/19/2006	22491.4	22597.6	49.9	42.3
4/20/2006	22597.6	22774	127.8	34.6
4/21/2006	22774	22880.1	30.9	61.2
4/22/2006	0	0	0	0
4/23/2006	0	0	0	0
4/24/2006	22880.1	23075.7	108.3	73.3
4/25/2006	23075.7	23211.8	44.7	77.4
4/26/2006	23211.8	23339.6	64.9	62.9
4/27/2006	23339.6	23514.1	111.8	48.7
4/28/2006	23514.1	23612.2	98.1	
4/29/2006	0	0	0	0
4/30/2006	0	0	0	0
		2736.5	1796.4	940.1
		Total Miles	ADI Miles	DLID Mileage

Annual Progress Report

For the

Texas Water Development Board - Agricultural Water Conservation Demonstration Initiative Grant

Maximization of On-Farm Surface Water Use Efficiency by Integration of On-Farm Application and District Delivery Systems

Economic Evaluation of Demonstrated Technologies, FARM Assistance Program

FARM Assistance

Helping Agriculture Make Informed Decisions

Submitted by:
Texas Cooperative Extension, FARM Assistance
Dr. Steven Klose
And
Mac Young

February 15th, 2007

AGRICULTURAL DEMONSTRATION INITIATIVE
Texas Cooperative Extension, FARM Assistance Sub-Contract with Harlingen Irrigation
TCE Account # 422460 - Harlingen Irrigation District

Annual Contract Report for the period ending Feb 15, 2007

Scope of Work Task B.5
Economic Evaluation of Demonstrated Technologies, FARM Assistance Program

Activities and continual progress regarding the FARM Assistance task of the ADI project of the Harlingen Irrigation District revolves around two primary objectives. The first is collaborating with project management team and coordinating the FARM Assistance program into the project concepts, including participation in management team meetings, planning sessions, producer meetings, and contributions to project promotional materials. TCE faculty also supported the overall project effort of recruiting project demonstrators. The second objective is the completion of the economic analysis for project demonstrations. Economic analyses for individual demonstrators range from conducting an evaluation of the site demonstration to providing the complete FARM Assistance strategic analysis service for the demonstration participant. Analyses of the 2006 site demonstrations are included. A summary of the contact, status, and analysis conducted for 2006 demonstrators and potential 2007 demonstrators follows:

2005 Demonstrations

- Site 41A-B (cotton, surge irrigation)
  Completed volumetric irrigation cost Analysis—*Impact of Volumetric Water Pricing for Cotton Comparing Furrow vs. Surge Irrigation in the Lower Rio Grande Valley*. Farm Assistance *Focus* Series 2006-3, Texas Cooperative Extension, Texas A&M University System. http//:farmassistance.tamu.edu.

- Site 46A-B (sugarcane, surge irrigation)
  Completed volumetric irrigation cost Analysis—*Impact of Volumetric Water Pricing for Sugarcane Comparing Furrow vs. Surge Irrigation in the Lower Rio Grande Valley*. Farm Assistance *Focus* Series 2006-4, Texas Cooperative Extension, Texas A&M University System. http//:farmassistance.tamu.edu.

- *Water Conservation and Water Pricing in the Lower Rio Grande Valley*. Poster presented at the Southern Agricultural Economics Association 2007 Annual Meeting, Mobile, Alabama, February 4-6, 2007.

2006 Demonstrations

- Sites 1A-E (1A: Rio Red grapefruit, narrow border flood; 1B: Valencia oranges; narrow border flood; 1C: Rio Red grapefruit, narrow border flood; 1E: onions, 1-line drip)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Sites 28A-D (28A: Valencia Oranges, micro-jet spray; 28C: Rio Red grapefruit, micro-jet spray; 28D: early oranges, 2-line drip
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 41A-B (cotton, surge irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 42A-B (42A: grain sorghum, surge; 42B: cotton, surge irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 43A-B (43A: cotton, drip; 43B: cotton, furrow irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 44A (cotton, surge irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 45A (sugar cane, furrow irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Oscar Alvarez (Tifton grass, LEP center pivot)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (not included)

- Bruce Gamble (corn & vegetables, drip)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (not included)

2006 Potential Demonstrators

- Fernando Vieto, Sharyland Orchards
  Held introductory meeting with cooperator and provided information requirements
  Several attempts to conduct initial data collection have been cancelled by client.

- Levi Burns
  Held introductory meeting with cooperator and provided information requirements
  Several attempts to conduct initial data collection have been cancelled by client.

- Don & Tom Wetegrove
  Held introductory meeting with cooperator and provided information requirements
  Attempts to conduct initial data collection have not been successful.

- Mark Fryer
  Held introductory meeting with cooperator and provided information requirements
  Attempts in 2006 to conduct initial data collection were not successful.

- Richard Treadaway, Duda
  Held introductory meeting with cooperator and provided information requirements
  Attempts to conduct initial data collection have not been successful.

- Juan Ramirez
  Attempts to conduct initial data collection have not been successful.

2007 Potential Demonstrators

- Bruce Gamble
  Initial data collection meeting scheduled for early March

- Mark Fryer
  Initial data collection meeting scheduled for late February

- Jim Hoffmann
  Initial data collection meeting scheduled for late February

- Jim Pawlik
  Initial data collection meeting scheduled for early March

- Sam Morrow
  Initial data collection meeting scheduled for March

- B S Farms
  Initial data collection meeting scheduled for March

- Sharyland Orchards
  Initial data collection meeting scheduled for February or March

- Leonard Simmons
  Initial data collection meeting scheduled for April

- Tom McLemore
  Initial data collection meeting scheduled for September

- Chris Allen
  Initial data collection meeting scheduled for September

Water Conservation and Water Pricing in the Lower Rio Grande Valley

Melissa Jupe, Mac Young, Steven Klose, Greg Kaase & Jason Morris

Department of Agricultural Economics, Texas A&M University

Texas Cooperative EXTENSION
The Texas A&M University System

FARM Assistance
Planning Solutions

Abstract:

The recent droughts in Texas have exacerbated the need for investigating water conservation methods to be used in the Lower Rio Grande Valley. This analysis illustrates the financial incentives to conserve water that may exist under volumetric water pricing. The Harlingen Irrigation District along with the Texas Water Development Board have recently implemented a project demonstrating water conserving practices. Initial demonstrations, for two 38-acre water sites, suggest the possibility of conserving water through the use of surge irrigation instead of traditional flood. However, the current abundance of surface water from the Rio Grande and existing pricing structures create no incentives for producers to invest in water conservation.

Introduction:

Surface water in the Texas Lower Rio Grande Valley is managed by the local irrigation districts. Historically, water usage in this area is paid for by access rather than volume. This pricing structure works well at times, but provides no financial incentive for the individual producer to conserve water. Existing state laws indicate that water is to be sold by volume. However, lack of metering equipment, tradition and the current availability of water makes these laws unenforceable. The potential of volumetric pricing structure is critical to financial viability and adoption of water conserving practices and systems.

Data:

Two specific 38-acre site demonstrations were linked to the Harlingen Irrigation District and the Texas Water Development Board demonstration projects in the Lower Rio Grande Valley. The 38-acre sites compare the use of surge irrigation to traditional flood in the production of cotton and sugarcane.

Methodology:

10 year financial simulation of returns for a specific enterprise using stochastic commodity prices and yields. Scenarios compare the financial performance of the enterprise under the existing water price structure and two volumetric pricing structures.

Results:

The implementation of surge irrigation appears to save water, but requires an initial investment of new equipment. With current water pricing the purchase of a surge irrigation valve is a losing proposition. However, if the current availability of low cost and plentiful irrigation water changes or if water districts switch to volumetric pricing, the profitability of both cotton and sugarcane production could be affected and the economic incentives to switch to surge irrigation systems will increase.

Cotton

Table 1: Irrigation Application and Cost Information for 38 acre Cotton site, Volumetric Pricing

Irrigation Method	Acre Inches Applied	Cost Per Acre Inch	Water Cost Per Acre	Polypipe & Irrigation Labor Per Acre	Irrigation Cost per Acre	Surge Valve
Furrow-1	19.53	$1	$19.53	$18.00	$37.53	
Surge-2	13.48	$1	$13.48	$18.00	$31.48	$1,800
Furrow-3	19.53	$5	$97.65	$18.00	$115.65	
Surge-4	13.48	$5	$67.40	$18.00	$85.40	$1,800

Table 2: 10-year Average Financial Indicators for 38 acre Cotton site, Volumetric Pricing

Irrigation Method	Net Cash Farm Income ($1,000)	Prob Net Cash Income < 0 (%)	Avg Annual Operating Expense/Receipts
Furrow-1	8.28	1.00	0.74
Surge-2	8.35	1.00	0.74
Furrow-3	5.09	8.30	0.85
Surge-4	6.15	3.90	0.81

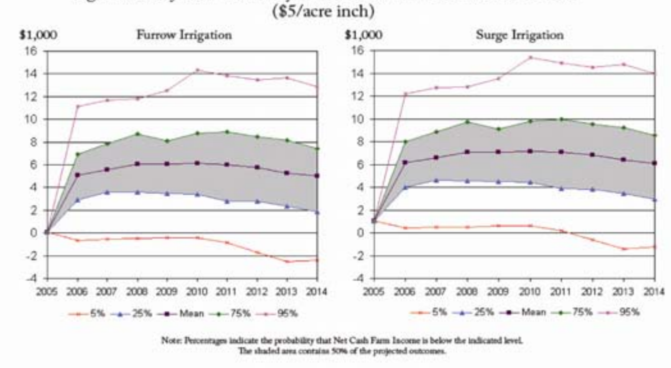
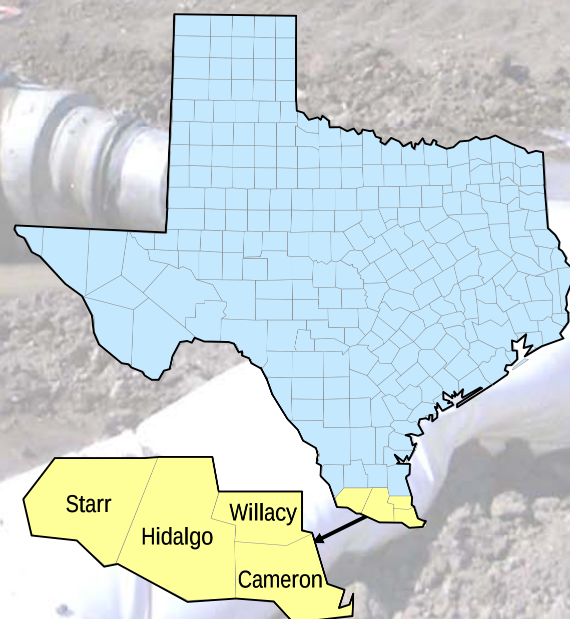


Figure 1: Projected Variability in Net Cash Farm Income for Cotton ($5/acre inch)



Sugarcane

Table 3: Irrigation Application and Cost Information for 38-acre Sugarcane site, Volumetric Pricing

Irrigation Method	Acre Inches Applied	Cost Per Acre Inch	Water Cost Per Acre	Polypipe & Irrigation Labor Per Acre	Irrigation Cost per Acre	Surge Valve
Furrow-1	30.68	$1	$30.68	$26.00	$56.68	
Surge-2	14.64	$1	$14.64	$26.00	$40.64	$1,800
Furrow-3	30.68	$5	$153.40	$26.00	$179.40	
Surge-4	14.64	$5	$73.20	$26.00	$99.20	$1,800

Table 4: 10-year Average Financial Indicators for 38-acre Sugarcane site, Volumetric Pricing

Irrigation Method	Net Cash Farm Income ($1,000)	Prob Net Cash Income < 0 (%)	Avg Annual Operating Expense/Receipts
Furrow-1	4.99	23.60	0.67
Surge-2	5.36	22.40	0.65
Furrow-3	0.70	46.30	0.84
Surge-4	3.33	30.90	0.73

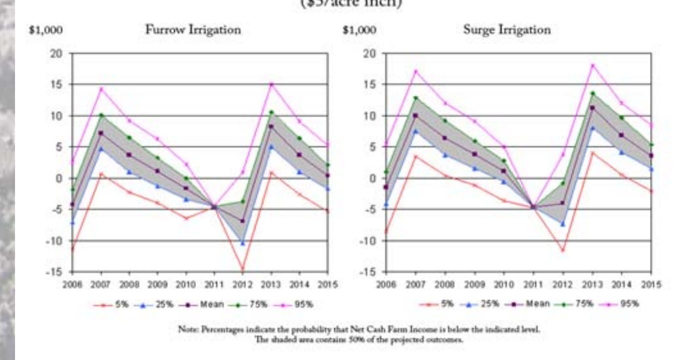


Figure 2: Projected Variability in Net Cash Farm Income for Sugarcane ($5/acre inch)

Conducted in Partnership with:

Agricultural Water Conservation Demonstration Initiative (ADI)

Harlingen Irrigation District

Texas Water Development Board

Demonstration Site 1A: Rio Red Grapefruit, Narrow Border Flood Irrigation

The basic costs of production assumptions for the Rio Red grapefruit demonstration are given in Table 1A-1. For the purpose of presenting economic viability and outlook for the 73-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 73 acres of narrow border flood irrigation Rio Red grapefruit production. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $200/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the narrow border flood irrigation is provided in Table 1A-2-A, followed by a cash flow summary (Table 1A-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1A-3 and Figure 1A-1. Table 1A-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $263,210 over the 10-year period and cash costs average $92,010. NCFI averages $171,200 due largely to the price being held at a constant $200/ton (Table 1A-3).

The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $20,000 to $354,000 for the site (Figure 1A-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $1.84 million by 2015 (Table 1A-3). The average cash flow balances (Table 1A-3) are intended to illustrate the cash requirements or flows generated using the narrow border flood irrigation method.

Table 1A-1. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Narrow Border Flood
PLANTED ACRES	73
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	18
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	200
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	0
HERBICIDES	0
INSECTICIDES	425
FUNGICIDES	0
CUSTOM APPLICATION	470
SCOUTING / OTHER	0
IRRIGATION FUEL	100
TILLAGE/HARVST FUEL	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	0
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	210
PREMIUM RATE ($/ACRE)	93.1
PREMIUM COSTS	6796.2998

Table 1A - 2 - A. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	0	0	0	0	0	0	0	0	0	0
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	31,025	30,584	29,835	30,265	30,791	31,290	31,769	32,220	32,529	32,695
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	34,310	33,840	31,881	30,841	29,996	29,354	29,034	29,380	29,850	30,295
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	7,300	7,200	6,783	6,562	6,382	6,246	6,178	6,251	6,351	6,446
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	6,796	6,796	6,796	7,377	7,377	7,377	7,377	7,377	7,377	7,377
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	79,431	78,421	75,295	75,045	74,546	74,267	74,357	75,228	76,107	76,812
CASH RENT FOR CROPLAND	16,060	16,060	16,060	16,060	16,060	16,060	16,060	16,060	16,060	16,060
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	95,491	94,481	91,355	91,105	90,606	90,327	90,417	91,288	92,167	92,872
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**95,491**	**94,481**	**91,355**	**91,105**	**90,606**	**90,327**	**90,417**	**91,288**	**92,167**	**92,872**
NET CASH FARM INCOME	**167,309**	**168,319**	**171,445**	**171,695**	**172,194**	**172,473**	**172,383**	**171,512**	**170,633**	**169,928**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**167,309**	**168,319**	**171,445**	**171,695**	**172,194**	**172,473**	**172,383**	**171,512**	**170,633**	**169,928**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
CASH EXPENSES ($/ACRE)	1,308	1,294	1,251	1,248	1,241	1,237	1,239	1,251	1,263	1,272
NET CASH INCOME ($/ACRE)	2,292	2,306	2,349	2,352	2,359	2,363	2,361	2,349	2,337	2,328

Table 1A - 2 - B. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**167,309**	**338,188**	**514,672**	**694,242**	**877,057**	**1,063,124**	**1,252,304**	**1,444,104**	**1,638,709**
PLUS:										
NET CASH FARM INCOME	167,309	168,319	171,445	171,695	172,194	172,473	172,383	171,512	170,633	169,928
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	2,560	5,039	7,874	10,622	13,594	16,797	20,287	23,972	27,858
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**167,309**	**338,188**	**514,672**	**694,242**	**877,057**	**1,063,124**	**1,252,304**	**1,444,104**	**1,638,709**	**1,836,495**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	167,309	338,188	514,672	694,242	877,057	1,063,124	1,252,304	1,444,104	1,638,709	1,836,495
ENDING YEAR CASH RESERVE	**167,309**	**338,188**	**514,672**	**694,242**	**877,057**	**1,063,124**	**1,252,304**	**1,444,104**	**1,638,709**	**1,836,495**

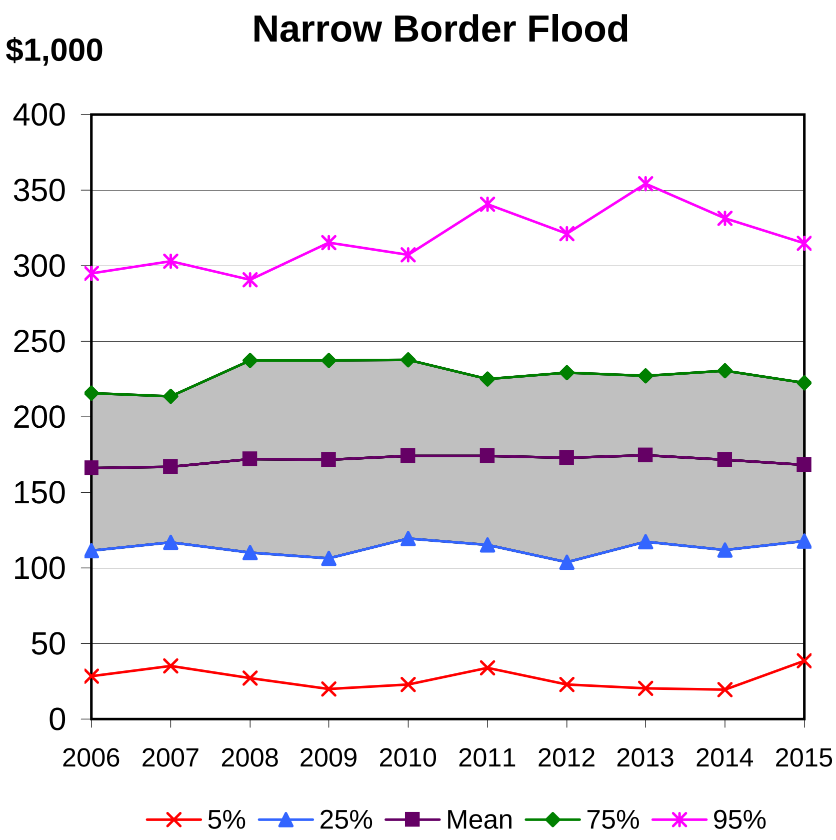
Table 1A-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Total Cash Receipts ($1000)	
2006	261.49
2007	261.65
2008	263.27
2009	262.52
2010	264.74
2011	264.30
2012	263.41
2013	265.74
2014	263.86
2015	261.15
2006-2015 Average	**263.21**
Total Cash Costs ($1000)	
2006	95.49
2007	94.49
2008	91.36
2009	91.10
2010	90.61
2011	90.33
2012	90.42
2013	91.29
2014	92.17
2015	92.87
2006-2015 Average	**92.01**
Net Cash Farm Income ($1000)	
2006	166.00
2007	167.16
2008	171.91
2009	171.42
2010	174.13
2011	173.97
2012	172.99
2013	174.45
2014	171.69
2015	168.28
2006-2015 Average	**171.20**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	2.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	2.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 1A-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Ending Cash Reserves ($1000)	
2006	166.00
2007	335.70
2008	512.61
2009	691.87
2010	876.59
2011	1,064.14
2012	1,253.95
2013	1,448.71
2014	1,644.45
2015	1,840.69
2006-2015 Average	**983.47**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.41
2007	0.40
2008	0.40
2009	0.39
2010	0.39
2011	0.39
2012	0.39
2013	0.40
2014	0.40
2015	0.40
2006-2015 Average	**0.40**

Figure 1A-1. Projected Variability in Net Cash Farm Income for Rio Red Grapefruit, Narrow Border Flood Irrigation.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 1B: Valencia Oranges, Narrow Border Flood Irrigation

The basic costs of production assumptions for the Valencia oranges demonstration are given in Table 1B-1. For the purpose of presenting economic viability and outlook for the 15-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 15 acres of narrow border flood irrigation Valencia oranges production. The orchard was assumed to be five years old. The Valencia orange price is held constant at $150/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the narrow border flood irrigation is provided in Table 1B-2-A, followed by a cash flow summary (Table 1B-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1B-3 and Figures 1B-1 and 1B-2. Table 1B-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $31,540 over the 10-year period and cash costs average $17,980. NCFI averages $13,560 due largely to the price being held at a constant $150/ton and increasing yields as trees mature (Table 1B-3). The risk associated with prices and yields suggests a 17.3% chance of negative NCFI. In a normal production year, NCFI could range as much as -$11,000 to $45,000 for the site (Figure 1B-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $144,460 by 2015 (Table 1B-3). The average cash flow balances (Table 1B-3) are intended to illustrate the cash requirements or flows generated using the narrow border flood irrigation method. Figure 1B-2 depicts the growth in cash reserves, and the risk associated with the ending cash balance by reflecting the probability of carryover debt over the 10-year projection. The probability of carryover is 41% in 2006 and then declines to 2% or less by 2013.

Table 1B-1. Valencia Oranges, Narrow Border Flood Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Yr5	Yr6	Yr7
PLANTED ACRES	15	15	15
BASE ACRES	0	0	0
YIELD UNITS	ton	ton	ton
BUDGETING YIELD	8	12	15
FARM PROG YLD DIR	0	0	0
FARM PROG YLD CCP	0	0	0
PRICES/YIELD UNIT	150	150	150
VARIABLE PRODUCTION COSTS ($/ACRE)			
SEED	0	0	0
FERTILIZER	0	0	0
HERBICIDES	0	0	0
INSECTICIDES	350	375	375
FUNGICIDES	0	0	0
CUSTOM APPLICATION	370	470	470
SCOUTING / OTHER	0	0	0
IRRIGATION FUEL	100	100	100
TILLAGE/HARVST FUEL	0	0	0
HARVESTING, HAULING, DRYING & CHECKOFF:			
$/YIELD UNIT	0	0	0
HARVEST COST/ACRE	0	0	0
BOLL WEEVIL COST/ACRE	0	0	0
LABOR COST /ACRE	0	0	0
CROP INSURANCE			
YIELD ELECTION (FRACTION)	0.5	0.5	0.5
YIELD COVERAGE GUARANTEE	0	0	0
PRICE ELECTION (FRACTION)	1	1	1
PRICE GUARANTEE	210	0	0
PREMIUM RATE ($/ACRE)	61.71	80.33	93.1
PREMIUM COSTS	925.65	0	0

Table 1B - 2 - A. Valencia Oranges, Narrow Border Flood Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	18,000	27,000	33,750	33,750	33,750	33,750	33,750	33,750	33,750	33,750
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**18,000**	**27,000**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	0	0	0	0	0	0	0	0	0	0
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	5,250	5,545	5,409	5,487	5,583	5,673	5,760	5,842	5,898	5,928
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	5,550	6,953	6,551	6,337	6,164	6,032	5,966	6,037	6,134	6,225
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,500	1,479	1,394	1,348	1,311	1,283	1,269	1,284	1,305	1,324
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	926	1,205	1,396	1,516	1,516	1,516	1,516	1,516	1,516	1,516
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	13,226	15,183	14,750	14,689	14,573	14,504	14,511	14,679	14,852	14,993
CASH RENT FOR CROPLAND	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	16,526	18,483	18,050	17,989	17,873	17,804	17,811	17,979	18,152	18,293
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**16,526**	**18,483**	**18,050**	**17,989**	**17,873**	**17,804**	**17,811**	**17,979**	**18,152**	**18,293**
NET CASH FARM INCOME	**1,474**	**8,517**	**15,700**	**15,761**	**15,877**	**15,946**	**15,939**	**15,771**	**15,598**	**15,457**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**1,474**	**8,517**	**15,700**	**15,761**	**15,877**	**15,946**	**15,939**	**15,771**	**15,598**	**15,457**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	1,200	1,800	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250
CASH EXPENSES ($/ACRE)	1,102	1,232	1,203	1,199	1,192	1,187	1,187	1,199	1,210	1,220
NET CASH INCOME ($/ACRE)	98	568	1,047	1,051	1,058	1,063	1,063	1,051	1,040	1,030

Table 1B - 2 - B. Valencia Oranges, Narrow Border Flood Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**1,474**	**10,014**	**25,863**	**42,020**	**58,539**	**75,393**	**92,523**	**109,793**	**127,214**
PLUS:										
NET CASH FARM INCOME	1,474	8,517	15,700	15,761	15,877	15,946	15,939	15,771	15,598	15,457
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	23	149	396	643	907	1,191	1,499	1,823	2,163
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**1,474**	**10,014**	**25,863**	**42,020**	**58,539**	**75,393**	**92,523**	**109,793**	**127,214**	**144,833**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	1,474	10,014	25,863	42,020	58,539	75,393	92,523	109,793	127,214	144,833
ENDING YEAR CASH RESERVE	**1,474**	**10,014**	**25,863**	**42,020**	**58,539**	**75,393**	**92,523**	**109,793**	**127,214**	**144,833**

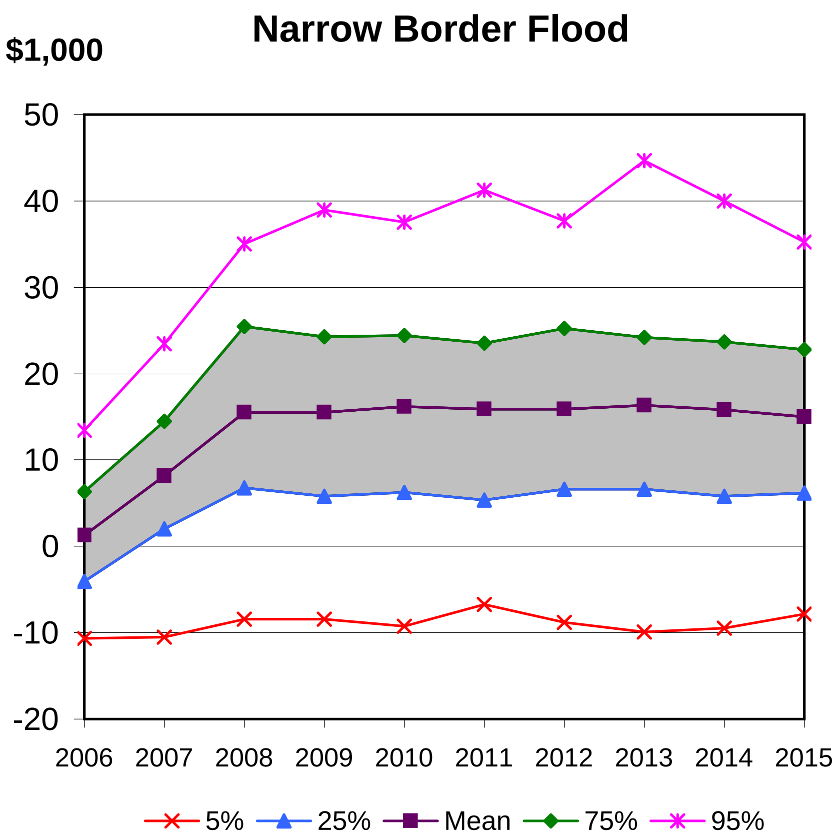
Table 1B-3. Valencia Oranges, Narrow Borde Flood Irrigation Demonstration

	Narrow Border Flood
Total Cash Receipts ($1000)	
2006	17.82
2007	26.84
2008	33.68
2009	33.62
2010	34.15
2011	33.75
2012	33.77
2013	34.42
2014	34.02
2015	33.36
2006-2015 Average	**31.54**
Total Cash Costs ($1000)	
2006	16.53
2007	18.68
2008	18.18
2009	18.09
2010	17.94
2011	17.87
2012	17.88
2013	18.05
2014	18.24
2015	18.39
2006-2015 Average	**17.98**
Net Cash Farm Income ($1000)	
2006	1.29
2007	8.16
2008	15.49
2009	15.53
2010	16.21
2011	15.87
2012	15.89
2013	16.37
2014	15.78
2015	14.98
2006-2015 Average	**13.56**
Prob. Net Cash Income < Zero (%)	
2006	41.00
2007	19.00
2008	14.00
2009	12.00
2010	15.00
2011	14.00
2012	14.00
2013	14.00
2014	14.00
2015	16.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**17.30**

Table 1B-3. Valencia Oranges, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Ending Cash Reserves ($1000)	
2006	1.29
2007	9.51
2008	25.16
2009	41.10
2010	57.95
2011	74.73
2012	91.81
2013	109.68
2014	127.30
2015	144.46
2006-2015 Average	**68.30**
Prob. of Ending Cash Reserves < Zero (%)	
2006	41.00
2007	22.00
2008	9.00
2009	4.00
2010	5.00
2011	4.00
2012	3.00
2013	2.00
2014	2.00
2015	2.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**9.40**
Average Annual Operating Expense/Receipts	
2006	1.18
2007	0.86
2008	0.69
2009	0.68
2010	0.69
2011	0.67
2012	0.68
2013	0.69
2014	0.70
2015	0.69
2006-2015 Average	**0.75**

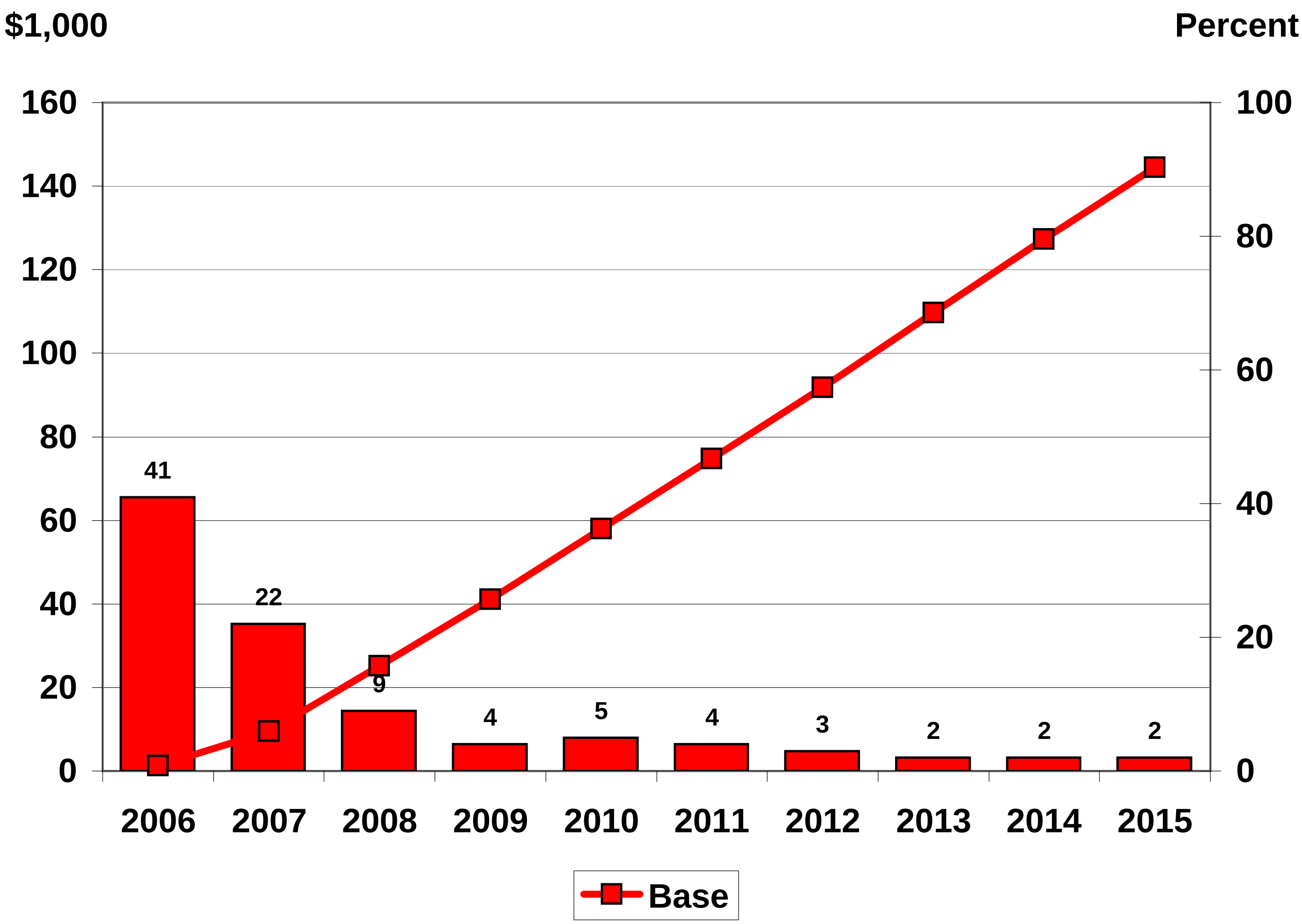
Figure 1B-1. Projected Variability in Net Cash Farm Income for Valencia Oranges, Narrow Border Flood Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 1B-2. Ending Cash Reserves and Probability of Having to Refinance Operating Note for Valencia Oranges, Narrow Borde Flood Irrigation Demonstration.



FARM Assistance

Helping Agriculture Make Informed Decisions

Demonstration Site 1C: Rio Red Grapefruit, Narrow Border Flood Irrigation

The basic costs of production assumptions for the Rio Red grapefruit demonstration are given in Table 1C-1. For the purpose of presenting economic viability and outlook for the 85-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 85 acres of narrow border flood irrigation Rio Red grapefruit production. The orchard was assumed to be 5 years old. The Rio Red grapefruit price is held constant at $200/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the narrow border flood irrigation is provided in Table 1C-2-A, followed by a cash flow summary (Table 1C-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1C-3 and Figure 1C-1. Table 1C-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $376,220 over the 10-year period and cash costs average $102,350. NCFI averages $273,870 due largely to the price being held at a constant $200/ton and increasing yields for maturing trees (Table 1C-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $33,000 to $561,000 for the site (Figure 1C-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $2.9 million by 2015 (Table 1C-3). The average cash flow balances (Table 1C-3) are intended to illustrate the cash requirements or flows generated using the narrow border flood spray irrigation method.

Table 1C-1. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Yr5	Yr6	Yr7
PLANTED ACRES	85	85	85
BASE ACRES	0	0	0
YIELD UNITS	ton	ton	ton
BUDGETING YIELD	17	20	23
FARM PROG YLD DIR	0	0	0
FARM PROG YLD CCP	0	0	0
PRICES/YIELD UNIT	200	200	200
VARIABLE PRODUCTION COSTS ($/ACRE)			
SEED	0	0	0
FERTILIZER	0	0	0
HERBICIDES	0	0	0
INSECTICIDES	350	375	375
FUNGICIDES	0	0	0
CUSTOM APPLICATION	470	470	470
SCOUTING / OTHER	0	0	0
IRRIGATION FUEL	100	100	100
TILLAGE/HARVST FUEL	0	0	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0	0	0
HARVEST COST/ACRE	0	0	0
BOLL WEEVIL COST/ACRE	0	0	0
LABOR COST /ACRE	0	0	0
CROP INSURANCE			
YIELD ELECTION (FRACTION)	0.5	0.5	0.5
YIELD COVERAGE GUARANTEE	0	0	0
PRICE ELECTION (FRACTION)	1	1	1
PRICE GUARANTEE	210	0	0
PREMIUM RATE ($/ACRE)	71.7	80.83	93.1
PREMIUM COSTS	6094.4995	0	0

Table 1C - 2 - A. Rio Red Grapefruit, Narrrow Border Flood Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	289,000	340,000	391,000	391,000	391,000	391,000	391,000	391,000	391,000	391,000
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**289,000**	**340,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	0	0	0	0	0	0	0	0	0	0
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	29,750	31,422	30,653	31,094	31,635	32,147	32,639	33,103	33,421	33,591
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	39,950	39,403	37,121	35,911	34,927	34,180	33,807	34,209	34,757	35,275
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	8,500	8,384	7,898	7,641	7,431	7,272	7,193	7,279	7,395	7,505
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	6,094	6,871	7,914	8,589	8,589	8,589	8,589	8,589	8,589	8,589
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	84,294	86,079	83,585	83,235	82,583	82,189	82,229	83,180	84,162	84,960
CASH RENT FOR CROPLAND	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	102,994	104,779	102,285	101,935	101,283	100,889	100,929	101,880	102,862	103,660
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**102,994**	**104,779**	**102,285**	**101,935**	**101,283**	**100,889**	**100,929**	**101,880**	**102,862**	**103,660**
NET CASH FARM INCOME	**186,006**	**235,221**	**288,715**	**289,065**	**289,717**	**290,111**	**290,071**	**289,120**	**288,138**	**287,340**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**186,006**	**235,221**	**288,715**	**289,065**	**289,717**	**290,111**	**290,071**	**289,120**	**288,138**	**287,340**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	3,400	4,000	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
CASH EXPENSES ($/ACRE)	1,212	1,233	1,203	1,199	1,192	1,187	1,187	1,199	1,210	1,220
NET CASH INCOME ($/ACRE)	2,188	2,767	3,397	3,401	3,408	3,413	3,413	3,401	3,390	3,380

Table 1C - 2 - B. Rio Red Crapefruit, Narrow Border Flood Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**186,006**	**424,072**	**719,105**	**1,019,173**	**1,324,484**	**1,635,124**	**1,951,030**	**2,271,757**	**2,597,606**
PLUS:										
NET CASH FARM INCOME	186,006	235,221	288,715	289,065	289,717	290,111	290,071	289,120	288,138	287,340
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	2,846	6,319	11,002	15,593	20,529	25,835	31,607	37,711	44,159
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**186,006**	**424,072**	**719,105**	**1,019,173**	**1,324,484**	**1,635,124**	**1,951,030**	**2,271,757**	**2,597,606**	**2,929,106**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	186,006	424,072	719,105	1,019,173	1,324,484	1,635,124	1,951,030	2,271,757	2,597,606	2,929,106
ENDING YEAR CASH RESERVE	**186,006**	**424,072**	**719,105**	**1,019,173**	**1,324,484**	**1,635,124**	**1,951,030**	**2,271,757**	**2,597,606**	**2,929,106**

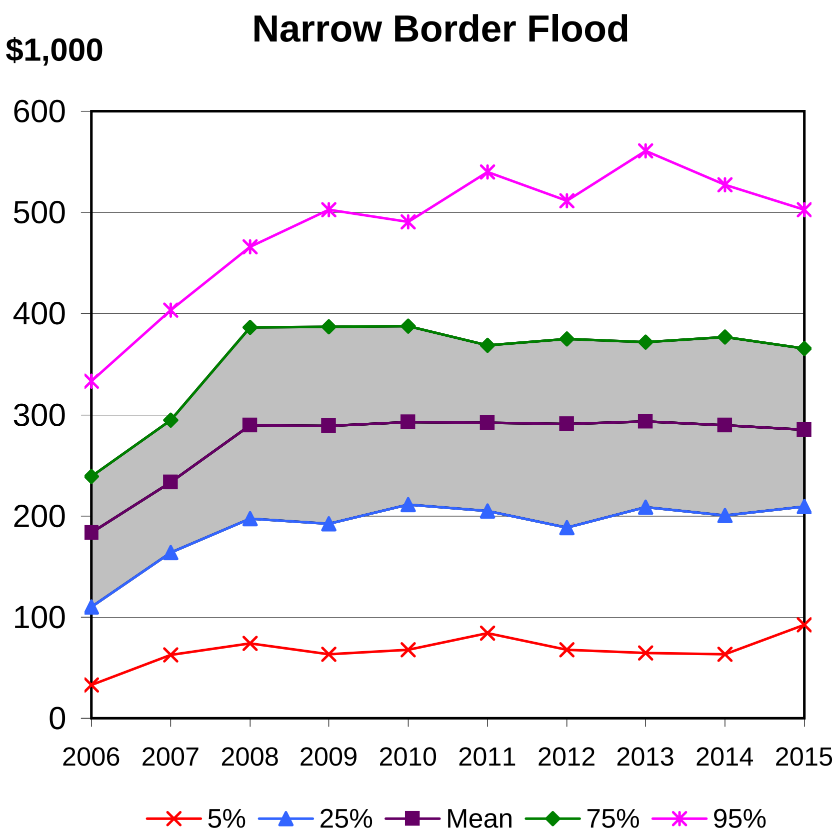
Table 1C-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Total Cash Receipts ($1000)	
2006	286.31
2007	338.14
2008	391.69
2009	390.59
2010	393.88
2011	393.23
2012	391.90
2013	395.37
2014	392.58
2015	388.54
2006-2015 Average	**376.22**
Total Cash Costs ($1000)	
2006	102.99
2007	104.79
2008	102.29
2009	101.93
2010	101.28
2011	100.89
2012	100.93
2013	101.88
2014	102.86
2015	103.66
2006-2015 Average	**102.35**
Net Cash Farm Income ($1000)	
2006	183.32
2007	233.35
2008	289.41
2009	288.65
2010	292.60
2011	292.34
2012	290.98
2013	293.49
2014	289.72
2015	284.88
2006-2015 Average	**273.87**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 1C-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Ending Cash Reserves ($1000)	
2006	183.32
2007	419.47
2008	715.13
2009	1,014.73
2010	1,322.85
2011	1,635.69
2012	1,952.51
2013	2,277.63
2014	2,605.16
2015	2,934.33
2006-2015 Average	**1,506.08**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.40
2007	0.35
2008	0.30
2009	0.30
2010	0.30
2011	0.29
2012	0.29
2013	0.30
2014	0.30
2015	0.30
2006-2015 Average	**0.31**

Figure 1C-1. Projected Variability in Net Cash Farm Income for Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 1E: Yellow Onions, 1-Line Drip Irrigation

The basic costs of production assumptions for the yellow onions demonstration are given in Table 1E-1. For the purpose of presenting economic viability and outlook for the 52-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 52 acres of 1-line drip irrigation yellow onions production. The onions were planted on 80-inch beds. The yellow onions cash receipts were calculated on a $1,150/acre basis and held constant during the 10-year projection. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a 1-line drip irrigation system at a cost of $1,550 per acre, including projected drip tape replacement. The 1-line drip system expense is evenly distributed ($155/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the 1-line irrigation is provided in Table 1E-2-A, followed by a cash flow summary (Table 1E-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1E-3 and Figure 1E-1. Table 1E-3

presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $60,040 over the 10-year period and cash costs average $54,420. NCFI averages $5,620 due largely to gross receipts per acre being held at a constant $1,150 per acre (Table 1E-3). The risk associated with prices and yields suggests a 29.1% chance of negative NCFI. In a normal production year, NCFI could range as much as -$20,000 to $27,000 for the site (Figure 1E-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $59,260 by 2015 (Table 1E-3). The average cash flow balances (Table 1E-3) are intended to illustrate the cash requirements or flows generated using the 1-line drip irrigation method.

Table 1E-1. Yellow Onions, 1-Line Drip Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Onion
PLANTED ACRES	52
BASE ACRES	0
YIELD UNITS	$$$
BUDGETING YIELD	1150
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	1
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	150
FERTILIZER	100.5
HERBICIDES	0
INSECTICIDES	167.55
FUNGICIDES	0
CUSTOM APPLICATION	41
SCOUTING / OTHER	0
IRRIGATION FUEL	90
TILLAGE/HARVST FUEL	39.75
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	120
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	0
PREMIUM RATE ($/ACRE)	70
PREMIUM COSTS	3640

Table 1E - 2 - A. Yellow Onions, 1-Line Drip Irrigation Demonstratio

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	59,800	59,800	59,800	59,800	59,800	59,800	59,800	59,800	59,800	59,800
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	7,800	7,914	7,811	7,887	8,000	8,132	8,206	8,302	8,385	8,452
FERTILIZER COSTS	5,226	5,256	5,198	5,138	5,208	5,254	5,287	5,377	5,459	5,515
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	8,713	8,589	8,378	8,499	8,647	8,787	8,922	9,048	9,135	9,182
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	2,132	2,103	1,981	1,916	1,864	1,824	1,804	1,826	1,855	1,882
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	4,680	4,616	4,349	4,207	4,092	4,004	3,960	4,008	4,072	4,132
FUEL & LUBE COSTS	2,067	2,039	1,921	1,858	1,807	1,768	1,749	1,770	1,798	1,825
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	6,240	6,430	6,638	6,823	6,988	7,171	7,356	7,527	7,707	7,885
SUB-TOTAL OF PROD COSTS	40,498	40,586	39,916	39,967	40,246	40,581	40,924	41,498	42,050	42,514
CASH RENT FOR CROPLAND	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Drip Sys	8,060	8,060	8,060	8,060	8,060	8,060	8,060	8,060	8,060	8,060
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	52,458	52,546	51,876	51,927	52,206	52,541	52,884	53,458	54,010	54,474
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	2,229	2,040	1,760	1,517	1,251	994	734	483	235	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**54,687**	**54,585**	**53,636**	**53,444**	**53,456**	**53,535**	**53,618**	**53,940**	**54,245**	**54,474**
NET CASH FARM INCOME	**5,113**	**5,215**	**6,164**	**6,356**	**6,344**	**6,265**	**6,182**	**5,860**	**5,555**	**5,326**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**5,113**	**5,215**	**6,164**	**6,356**	**6,344**	**6,265**	**6,182**	**5,860**	**5,555**	**5,326**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
CASH EXPENSES ($/ACRE)	1,052	1,050	1,031	1,028	1,028	1,030	1,031	1,037	1,043	1,048
NET CASH INCOME ($/ACRE)	98	100	119	122	122	120	119	113	107	102

Table 1E - 2 - B. Yellow Onions, 1-Line Drip Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**5,113**	**10,367**	**16,608**	**23,090**	**29,611**	**36,105**	**42,573**	**48,777**	**54,737**
PLUS:										
NET CASH FARM INCOME	5,113	5,215	6,164	6,356	6,344	6,265	6,182	5,860	5,555	5,326
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	39	77	127	177	229	285	345	405	468
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**5,113**	**10,367**	**16,608**	**23,090**	**29,611**	**36,105**	**42,573**	**48,777**	**54,737**	**60,531**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	5,113	10,367	16,608	23,090	29,611	36,105	42,573	48,777	54,737	60,531
ENDING YEAR CASH RESERVE	**5,113**	**10,367**	**16,608**	**23,090**	**29,611**	**36,105**	**42,573**	**48,777**	**54,737**	**60,531**

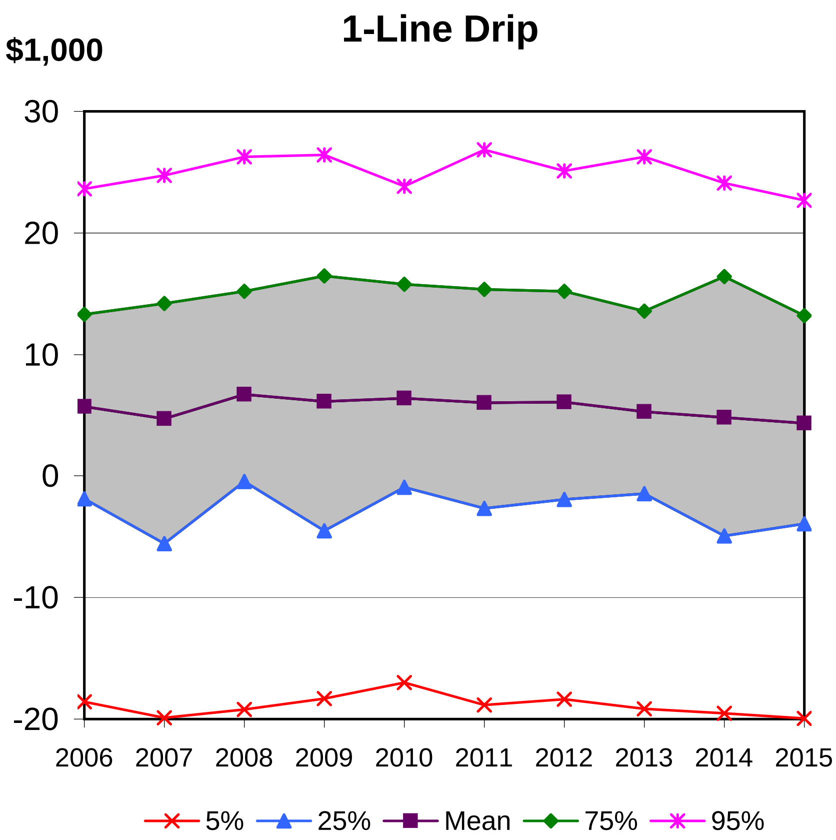
Table 1E-3. Yellow Onions, 1-Line Drip Irrigation Demonstration

	1-Line Drip
Total Cash Receipts ($1000)	
2006	60.41
2007	59.38
2008	60.52
2009	59.75
2010	60.16
2011	59.96
2012	60.28
2013	59.93
2014	60.00
2015	60.04
2006-2015 Average	**60.04**
Total Cash Costs ($1000)	
2006	54.69
2007	54.68
2008	53.80
2009	53.64
2010	53.75
2011	53.94
2012	54.21
2013	54.66
2014	55.18
2015	55.69
2006-2015 Average	**54.42**
Net Cash Farm Income ($1000)	
2006	5.72
2007	4.71
2008	6.72
2009	6.11
2010	6.42
2011	6.02
2012	6.07
2013	5.28
2014	4.82
2015	4.35
2006-2015 Average	**5.62**
Prob. Net Cash Income < Zero (%)	
2006	31.00
2007	32.00
2008	28.00
2009	28.00
2010	26.00
2011	27.00
2012	28.00
2013	31.00
2014	32.00
2015	28.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**29.10**

Table 1E-3. Yellow Onions, 1-Line Drip Irrigation Demonstration

	1-Line Drip
Ending Cash Reserves ($1000)	
2006	5.72
2007	10.49
2008	17.32
2009	23.61
2010	30.26
2011	36.59
2012	43.06
2013	48.82
2014	54.22
2015	59.26
2006-2015 Average	**32.94**
Prob. of Ending Cash Reserves < Zero (%)	
2006	31.00
2007	27.00
2008	24.00
2009	22.00
2010	21.00
2011	18.00
2012	18.00
2013	17.00
2014	15.00
2015	17.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**21.00**
Average Annual Operating Expense/Receipts	
2006	0.91
2007	0.94
2008	0.91
2009	0.93
2010	0.92
2011	0.93
2012	0.93
2013	0.94
2014	0.96
2015	0.96
2006-2015 Average	**0.93**

Figure 1E-1. Projected Variability in Net Cash Farm Income for the Yellow Onions, 1-Line Drip Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

Demonstration Site 28A: Valencia Oranges, Microjet Spray Irrigation

The basic costs of production assumptions for the Valencia orange microjet spray demonstration are given in Table 28A-1. For the purpose of presenting economic viability and outlook for the 8-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 8 acres of microjet spray irrigation Valencia orange production. The orchard trees were assumed to be 3 years old. The Valencia orange price is held constant at $140/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the microjet spray irrigation is provided in Table 28A-2-A, followed by a cash flow summary (Table 28A-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 28A-3 and Figures 28A-1 and 28A-2. Table 28A-3 presents the average outcomes for selected financial projections,

while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $15,480 over the 10-year period and cash costs average just under $8,000. NCFI is negative in 2006-2008 reflecting lower levels of production from immature trees. It then increases from $2,880 in 2009 to about $16,000 in 2015 (Table 28A-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI after 2011 when the trees reach maturity. In a normal production year and mature trees (2011-2015), NCFI could range as much as $3,500 to $34,000 for the site (Figure 28A-1). Cash reserves are expected to be negative in 2006-2009 and then grow throughout the remaining years of the projection period and reach $78,060 by 2015 (Table 28A-3). The average cash flow balances (Table 28A-3) are intended to illustrate the cash requirements or flows generated using the microjet spray irrigation method in a maturing orchard. Figure 28A-2 depicts the growth in cash reserves, and the risk associated with the ending cash balance by reflecting the probability of carryover operating debt in the early years of the projection. The probability of carryover debt is 99% or greater during 2006-2008 and then declines to 1% or less in 2013 as the trees reach maturity and annual production increases.

Table 28A-1. Valencia Oranges, Microjet Spray Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Valencia YR4	Valencia YR5	Valencia YR6	Valencia Yr7	Valencia YR8
PLANTED ACRES	8	0	0	0	0
BASE ACRES	0	0	0	0	0
YIELD UNITS	ton	ton	ton	ton	ton
BUDGETING YIELD	0.5	3	5	10	15
FARM PROG YLD DIR	0	0	0	0	0
FARM PROG YLD CCP	0	0	0	0	0
PRICES/YIELD UNIT	140	140	140	140	140
VARIABLE PRODUCTION COSTS ($/ACRE)					
SEED	0	0	0	0	0
FERTILIZER	25	35	45	55	85
HERBICIDES	50	63	75	88	100
INSECTICIDES	75	126	148	179	210
FUNGICIDES	0	0	40	40	40
CUSTOM APPLICATION	42.5	46	49	52	55
SCOUTING / OTHER	0	0	0	0	0
IRRIGATION FUEL	55	69	83	96	110
TILLAGE/HARVST FUEL	0	0	0	0	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0	0	0	0	0
HARVEST COST/ACRE	0	0	0	0	0
BOLL WEEVIL COST/ACRE	0	0	0	0	0
LABOR COST /ACRE	94	94	94	94	94
CROP INSURANCE					
YIELD ELECTION (FRACTION)	0.5	0.5	0.5	0.5	0.5
YIELD COVERAGE GUARANTEE	0	0	0	0	0
PRICE ELECTION (FRACTION)	1	1	1	1	1
PRICE GUARANTEE	150	0	0	0	0
PREMIUM RATE ($/ACRE)	35	95	95	105	110
PREMIUM COSTS	280	0	0	0	0

Table 28A - 2 - A. Valencia Oranges, Microjet Spray Irrigation Demonstratioi

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	560	3,360	5,600	11,200	16,800	20,160	23,520	24,640	24,640	24,640
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**560**	**3,360**	**5,600**	**11,200**	**16,800**	**20,160**	**23,520**	**24,640**	**24,640**	**24,640**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	200	282	358	433	678	684	688	700	710	718
HERBICIDE COSTS	400	502	591	700	803	811	819	830	838	844
INSECTICIDE COSTS	600	994	1,139	1,397	1,667	1,694	1,720	1,745	1,761	1,770
FUNGICIDE COSTS	0	0	324	329	333	337	341	345	349	352
CUSTOM APPLICATION	340	363	364	374	385	376	372	377	383	389
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	440	544	617	690	769	753	745	754	766	777
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	280	760	760	840	880	880	880	880	880	880
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	752	775	800	822	842	864	886	907	929	950
SUB-TOTAL OF PROD COSTS	3,012	4,220	4,953	5,585	6,357	6,400	6,452	6,537	6,616	6,680
CASH RENT FOR CROPLAND	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Microjet Sys	800	800	800	800	800	800	800	800	800	800
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	5,012	6,220	6,953	7,585	8,357	8,400	8,452	8,537	8,616	8,680
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	343	580	737	516	0	0	0	0	0
TOTAL CASH EXPENSES	**5,012**	**6,563**	**7,533**	**8,322**	**8,873**	**8,400**	**8,452**	**8,537**	**8,616**	**8,680**
NET CASH FARM INCOME	**-4,452**	**-3,203**	**-1,933**	**2,878**	**7,927**	**11,760**	**15,068**	**16,103**	**16,024**	**15,960**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**-4,452**	**-3,203**	**-1,933**	**2,878**	**7,927**	**11,760**	**15,068**	**16,103**	**16,024**	**15,960**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	70	420	700	1,400	2,100	2,520	2,940	3,080	3,080	3,080
CASH EXPENSES ($/ACRE)	626	820	942	1,040	1,109	1,050	1,056	1,067	1,077	1,085
NET CASH INCOME ($/ACRE)	-557	-400	-242	360	991	1,470	1,884	2,013	2,003	1,995

Table 28A - 2 - B. Valencia Oranges, Microjet Spray Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**0**	**0**	**0**	**0**	**1,217**	**12,996**	**28,270**	**44,831**	**61,600**
PLUS:										
NET CASH FARM INCOME	-4,452	-3,203	-1,933	2,878	7,927	11,760	15,068	16,103	16,024	15,960
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	0	0	0	0	19	205	458	744	1,047
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**-4,452**	**-3,203**	**-1,933**	**2,878**	**7,927**	**12,996**	**28,270**	**44,831**	**61,600**	**78,607**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	4,452	7,655	9,588	6,710	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**4,452**	**7,655**	**9,588**	**6,710**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	-4,452	-7,655	-9,588	-6,710	1,217	12,996	28,270	44,831	61,600	78,607
ENDING YEAR CASH RESERVE	**0**	**0**	**0**	**0**	**1,217**	**12,996**	**28,270**	**44,831**	**61,600**	**78,607**

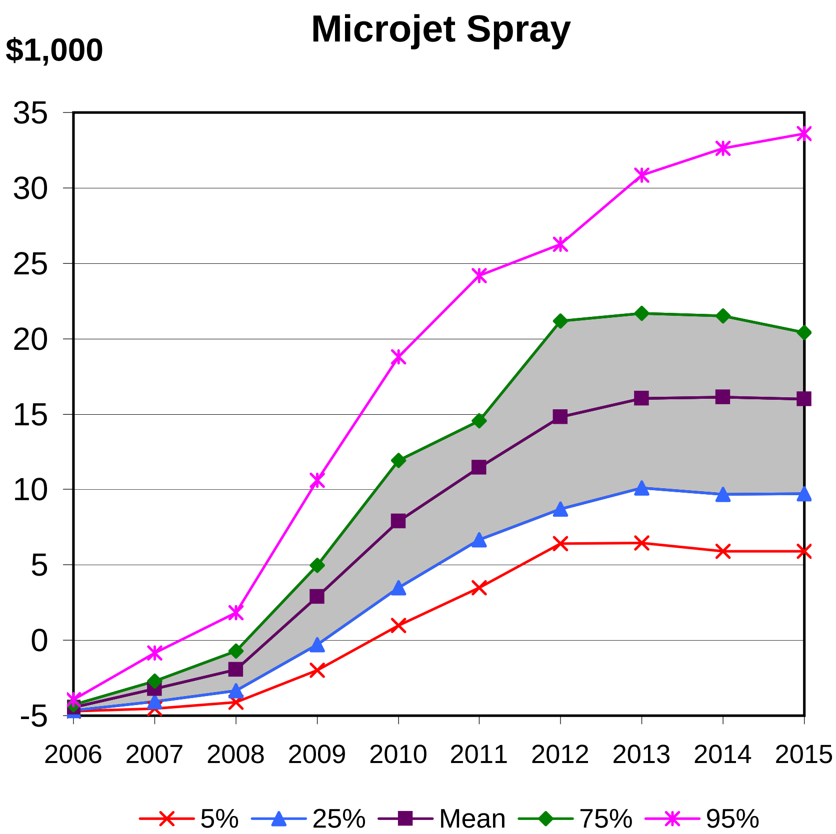
Table 28A-3. Valencia Oranges, Microjet Spray Irrigation Demonstration

	Microjet Spray
Total Cash Receipts ($1000)	
2006	0.56
2007	3.34
2008	5.60
2009	11.20
2010	16.79
2011	20.05
2012	23.31
2013	24.56
2014	24.74
2015	24.67
2006-2015 Average	**15.48**
Total Cash Costs ($1000)	
2006	5.01
2007	6.56
2008	7.53
2009	8.32
2010	8.90
2011	8.61
2012	8.48
2013	8.54
2014	8.62
2015	8.68
2006-2015 Average	**7.93**
Net Cash Farm Income ($1000)	
2006	-4.45
2007	-3.22
2008	-1.93
2009	2.88
2010	7.90
2011	11.44
2012	14.83
2013	16.02
2014	16.13
2015	15.99
2006-2015 Average	**7.56**
Prob. Net Cash Income < Zero (%)	
2006	99.00
2007	98.00
2008	84.00
2009	30.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**31.20**

Table 28A-3. Valencia Oranges, Microjet Spray Irrigation Demonstration

	Microjet Spray
Ending Cash Reserves ($1000)	
2006	-4.45
2007	-7.68
2008	-9.61
2009	-6.73
2010	1.17
2011	12.67
2012	27.71
2013	44.17
2014	61.03
2015	78.06
2006-2015 Average	**19.63**
Prob. of Ending Cash Reserves < Zero (%)	
2006	99.00
2007	99.00
2008	99.00
2009	91.00
2010	48.00
2011	10.00
2012	2.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**45.10**
Average Annual Operating Expense/Receipts	
2006	10.29
2007	2.05
2008	1.37
2009	0.76
2010	0.55
2011	0.46
2012	0.39
2013	0.38
2014	0.39
2015	0.39
2006-2015 Average	**1.70**

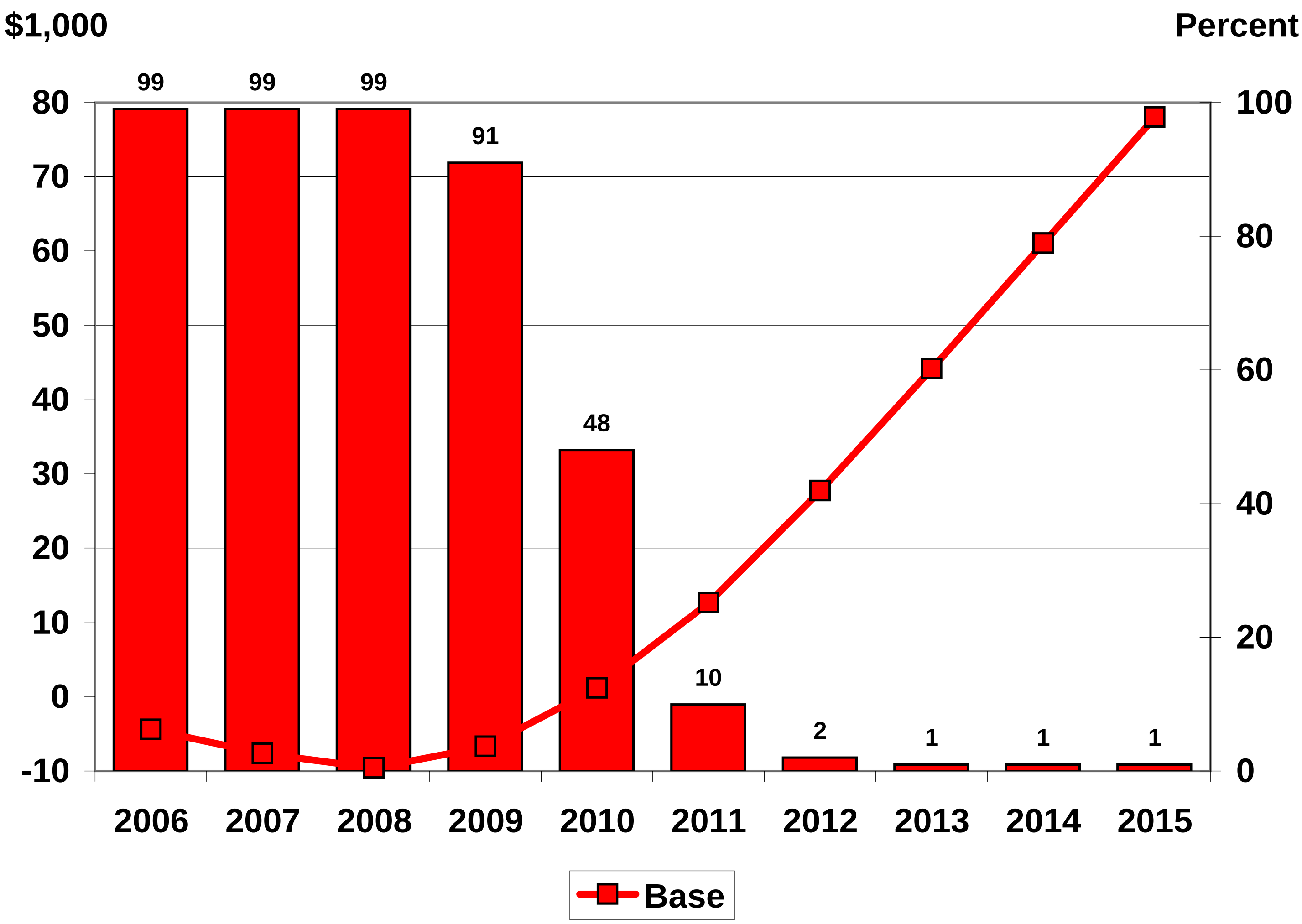
Figure 28A-1. Projected Variability in Net Cash Farm Income for Valencia Oranges, Microjet Spray Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 28A-2. Ending Cash Reserves and Probability of Having to Refinance Operating Note for Valencia Oranges, Microjet Spray Irrigation Demonstration.



FARM Assistance

Helping Agriculture Make Informed Decisions

Demonstration Site 28C: Rio Red Grapefruit, Microjet Spray Irrigation

The basic costs of production assumptions for the Rio Red grapefruit demonstration are given in Table 28C-1. For the purpose of presenting economic viability and outlook for the 8-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 8 acres of microjet spray irrigation Rio Red grapefruit production. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $150/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the microjet spray irrigation is provided in Table 28C-2-A, followed by a cash flow summary (Table 28C-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 28C-3 and Figure

28C-1. Table 28C-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $26,370 over the 10-year period and cash costs average $9,380. NCFI averages $17,000 due largely to the price being held at a constant $150/ton (Table 28C-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $6,000 to $35,000 for the site (Figure 28C-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $182,860 by 2015 (Table 28C-3). The average cash flow balances (Table 28C-3) are intended to illustrate the cash requirements or flows generated using the microjet spray irrigation method.

Table 28C-1. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Rio Red Grapefruit
PLANTED ACRES	8
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	22
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	150
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	85
HERBICIDES	100
INSECTICIDES	310
FUNGICIDES	40
CUSTOM APPLICATION	90
SCOUTING / OTHER	0
IRRIGATION FUEL	110
TILLAGE/HARVST FUEL	0
HARVESTING, HAULING, DRYING & CHECKOFF:	
$/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	79
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	150
PREMIUM RATE ($/ACRE)	110
PREMIUM COSTS	880

Table 28C - 2 - A. Rio Red Grapefruit, Microjet Spray Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	26,400	26,400	26,400	26,400	26,400	26,400	26,400	26,400	26,400	26,400
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	680	684	676	669	678	684	688	700	710	718
HERBICIDE COSTS	800	798	788	795	803	811	819	830	838	844
INSECTICIDE COSTS	2,480	2,445	2,385	2,419	2,461	2,501	2,539	2,576	2,600	2,614
FUNGICIDE COSTS	320	324	324	329	333	337	341	345	349	352
CUSTOM APPLICATION	720	710	669	647	629	616	609	617	626	636
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	880	868	818	791	769	753	745	754	766	777
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	880	880	880	880	880	880	880	880	880	880
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	632	651	672	691	708	726	745	762	781	799
SUB-TOTAL OF PROD COSTS	7,392	7,360	7,213	7,221	7,262	7,308	7,366	7,462	7,550	7,619
CASH RENT FOR CROPLAND	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Microjet Sys	800	800	800	800	800	800	800	800	800	800
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	9,392	9,360	9,213	9,221	9,262	9,308	9,366	9,462	9,550	9,619
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**9,392**	**9,360**	**9,213**	**9,221**	**9,262**	**9,308**	**9,366**	**9,462**	**9,550**	**9,619**
NET CASH FARM INCOME	**17,008**	**17,040**	**17,187**	**17,179**	**17,138**	**17,092**	**17,034**	**16,938**	**16,850**	**16,781**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**17,008**	**17,040**	**17,187**	**17,179**	**17,138**	**17,092**	**17,034**	**16,938**	**16,850**	**16,781**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
CASH EXPENSES ($/ACRE)	1,174	1,170	1,152	1,153	1,158	1,164	1,171	1,183	1,194	1,202
NET CASH INCOME ($/ACRE)	2,126	2,130	2,148	2,147	2,142	2,136	2,129	2,117	2,106	2,098

Table 28C - 2 - B. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**17,008**	**34,308**	**52,007**	**69,982**	**88,191**	**106,650**	**125,368**	**144,337**	**163,583**
PLUS:										
NET CASH FARM INCOME	17,008	17,040	17,187	17,179	17,138	17,092	17,034	16,938	16,850	16,781
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	260	511	796	1,071	1,367	1,685	2,031	2,396	2,781
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**17,008**	**34,308**	**52,007**	**69,982**	**88,191**	**106,650**	**125,368**	**144,337**	**163,583**	**183,145**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	17,008	34,308	52,007	69,982	88,191	106,650	125,368	144,337	163,583	183,145
ENDING YEAR CASH RESERVE	**17,008**	**34,308**	**52,007**	**69,982**	**88,191**	**106,650**	**125,368**	**144,337**	**163,583**	**183,145**

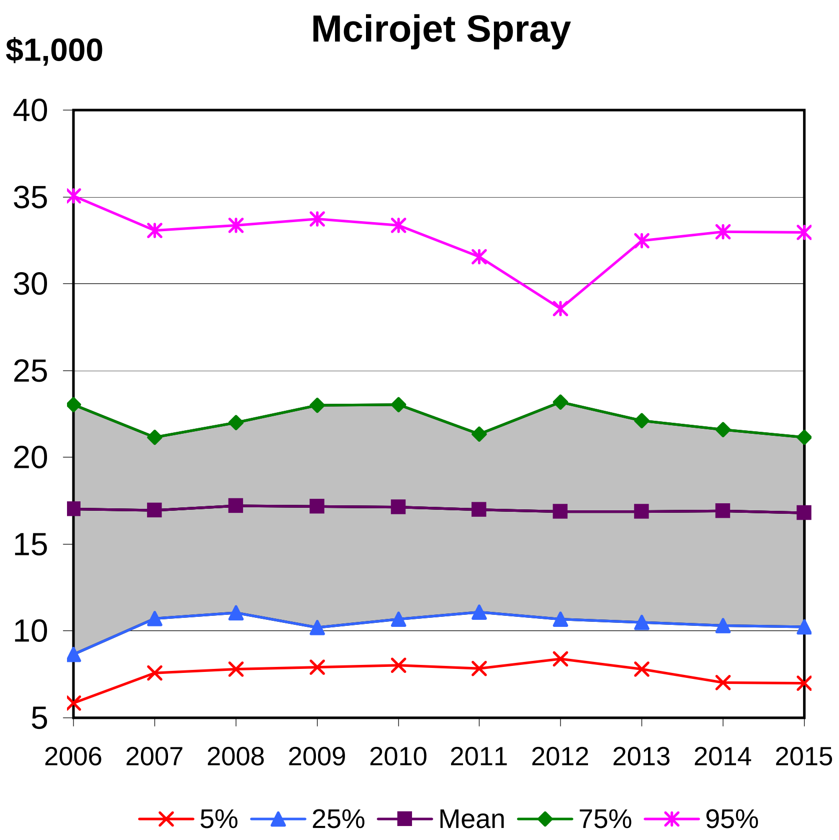
Table 28C-3. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

	Microjet Spray
Total Cash Receipts ($1000)	
2006	26.43
2007	26.31
2008	26.41
2009	26.39
2010	26.40
2011	26.30
2012	26.26
2013	26.34
2014	26.47
2015	26.42
2006-2015 Average	**26.37**
Total Cash Costs ($1000)	
2006	9.39
2007	9.36
2008	9.21
2009	9.22
2010	9.26
2011	9.31
2012	9.37
2013	9.46
2014	9.55
2015	9.62
2006-2015 Average	**9.38**
Net Cash Farm Income ($1000)	
2006	17.04
2007	16.95
2008	17.20
2009	17.17
2010	17.13
2011	16.99
2012	16.89
2013	16.88
2014	16.92
2015	16.80
2006-2015 Average	**17.00**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 28C-3. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

	Microjet Spray
Ending Cash Reserves ($1000)	
2006	17.04
2007	34.25
2008	51.96
2009	69.92
2010	88.12
2011	106.48
2012	125.05
2013	143.96
2014	163.28
2015	182.86
2006-2015 Average	**98.29**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.40
2007	0.38
2008	0.38
2009	0.38
2010	0.38
2011	0.38
2012	0.38
2013	0.39
2014	0.39
2015	0.40
2006-2015 Average	**0.39**

Figure 28C-1. Projected Variability in Net Cash Farm Income for Rio Red Grapefruit, Microjet Spray Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 28D: Early Oranges (Marrs & Navel), 2-Line Drip Irrigation

The basic costs of production assumptions for the early orange (Marrs & Navel) 2-line drip demonstration are given in Table 28D-1. For the purpose of presenting economic viability and outlook for the 7-acre site (3.5 acres of Marrs & 3.5 acres Navel), production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 7 acres of 2-line drip irrigation early orange production. The orchard was assumed to have mature trees. The early orange price is held constant at $115/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a 2-line drip system at a cost of $1,000 per acre. The 2-line drip system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the 2-line drip irrigation is provided in Table 28D-2-A, followed by a cash flow summary (Table 28D-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 28D-3 and Figure

28D-1. Table 28D-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $12,850 over the 10-year period and cash costs average $6,460. NCFI averages $6,390 due largely to the price being held at a constant $115/ton (Table 28D-3). The risk associated with prices and yields suggests a small chance of negative NCFI. In a normal production year, NCFI could range as much as -$1,000 to $18,000 for the site (Figure 28D-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $68,770 by 2015 (Table 28D-3). The average cash flow balances (Table 28D-3) are intended to illustrate the cash requirements or flows generated using the 2-line drip irrigation method.

Table 28D-1. Early Season Oranges (Marrs & Navel), 2-Line Drip Irrrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Early Orange
PLANTED ACRES	7
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	16
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	115
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	85
HERBICIDES	100
INSECTICIDES	210
FUNGICIDES	40
CUSTOM APPLICATION	25
SCOUTING / OTHER	0
IRRIGATION FUEL	110
TILLAGE/HARVST FUEL	0
HARVESTING, HAULING, DRYING & CHECKOFF:	
$/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	0
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	150
PREMIUM RATE ($/ACRE)	110
PREMIUM COSTS	770

Table 28D - 2 - A. Early Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	12,880	12,880	12,880	12,880	12,880	12,880	12,880	12,880	12,880	12,880
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	595	598	592	585	593	598	602	612	621	628
HERBICIDE COSTS	700	698	690	696	702	710	717	726	733	739
INSECTICIDE COSTS	1,470	1,449	1,414	1,434	1,459	1,483	1,505	1,527	1,541	1,549
FUNGICIDE COSTS	280	284	284	288	292	295	298	302	305	308
CUSTOM APPLICATION	175	173	163	157	153	150	148	150	152	155
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	770	759	715	692	673	659	652	659	670	680
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	770	770	770	770	770	770	770	770	770	770
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	4,760	4,731	4,627	4,622	4,642	4,664	4,692	4,746	4,793	4,828
CASH RENT FOR CROPLAND	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Drip 2 lines	700	700	700	700	700	700	700	700	700	700
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	6,510	6,481	6,377	6,372	6,392	6,414	6,442	6,496	6,543	6,578
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**6,510**	**6,481**	**6,377**	**6,372**	**6,392**	**6,414**	**6,442**	**6,496**	**6,543**	**6,578**
NET CASH FARM INCOME	**6,370**	**6,399**	**6,503**	**6,508**	**6,488**	**6,466**	**6,438**	**6,384**	**6,337**	**6,302**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**6,370**	**6,399**	**6,503**	**6,508**	**6,488**	**6,466**	**6,438**	**6,384**	**6,337**	**6,301**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840
CASH EXPENSES ($/ACRE)	930	926	911	910	913	916	920	928	935	940
NET CASH INCOME ($/ACRE)	910	914	929	930	927	924	920	912	905	900

Table 28D - 2 - B. Early Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**6,370**	**12,866**	**19,561**	**26,368**	**33,260**	**40,241**	**47,316**	**54,466**	**61,707**
PLUS:										
NET CASH FARM INCOME	6,370	6,399	6,503	6,508	6,488	6,466	6,438	6,384	6,337	6,302
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	97	192	299	403	516	636	767	904	1,049
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**6,370**	**12,866**	**19,561**	**26,368**	**33,260**	**40,241**	**47,316**	**54,466**	**61,707**	**69,058**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	6,370	12,866	19,561	26,368	33,260	40,241	47,316	54,466	61,707	69,058
ENDING YEAR CASH RESERVE	**6,370**	**12,866**	**19,561**	**26,368**	**33,260**	**40,241**	**47,316**	**54,466**	**61,707**	**69,058**

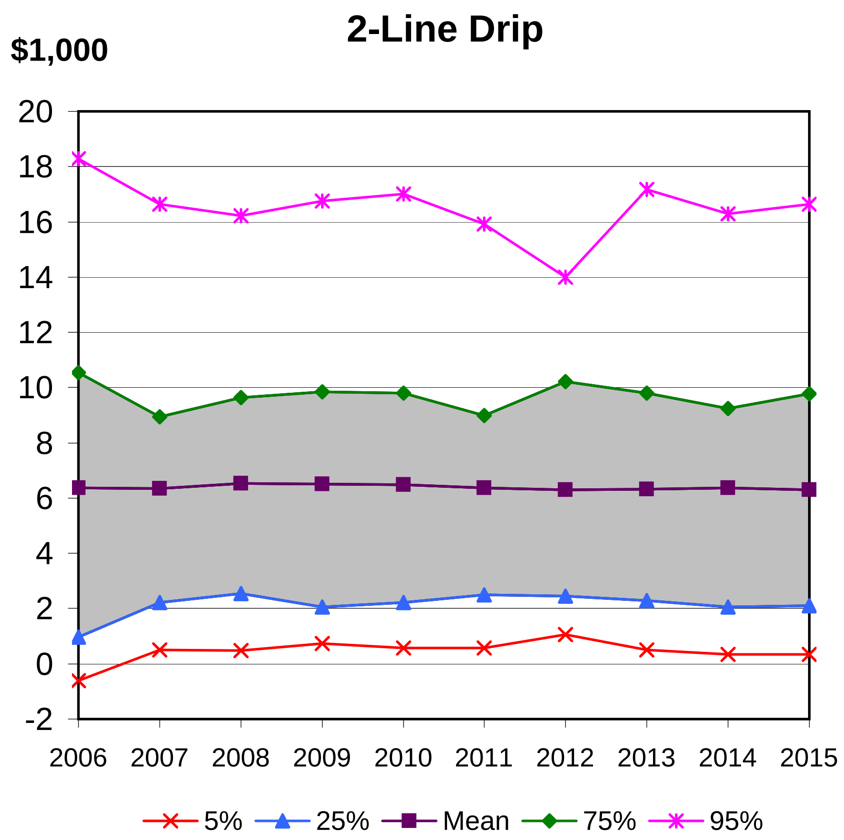
Table 28D-3. Early Season Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration

	2-Line Drip
Total Cash Receipts ($1000)	
2006	12.89
2007	12.83
2008	12.90
2009	12.87
2010	12.88
2011	12.79
2012	12.74
2013	12.83
2014	12.92
2015	12.88
2006-2015 Average	**12.85**
Total Cash Costs ($1000)	
2006	6.51
2007	6.49
2008	6.38
2009	6.37
2010	6.39
2011	6.41
2012	6.44
2013	6.50
2014	6.54
2015	6.58
2006-2015 Average	**6.46**
Net Cash Farm Income ($1000)	
2006	6.38
2007	6.35
2008	6.52
2009	6.50
2010	6.49
2011	6.38
2012	6.30
2013	6.33
2014	6.38
2015	6.31
2006-2015 Average	**6.39**
Prob. Net Cash Income < Zero (%)	
2006	15.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	2.00
2014	4.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**2.60**

Table 28D-3. Early Season Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration

	2-Line Drip
Ending Cash Reserves ($1000)	
2006	6.38
2007	12.83
2008	19.54
2009	26.34
2010	33.23
2011	40.12
2012	47.05
2013	54.15
2014	61.42
2015	68.77
2006-2015 Average	**36.98**
Prob. of Ending Cash Reserves < Zero (%)	
2006	15.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.60**
Average Annual Operating Expense/Receipts	
2006	0.63
2007	0.58
2008	0.57
2009	0.57
2010	0.57
2011	0.57
2012	0.57
2013	0.58
2014	0.59
2015	0.59
2006-2015 Average	**0.58**

Figure 28D-1. Projected Variability in Net Cash Farm Income for Early Season Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 41: Cotton, Surge Irrigation

The basic costs of production assumptions for the cotton surge demonstration are given in Table 41-1. For the purpose of presenting economic viability and outlook for the 38.5-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38.5 acres of surge irrigation cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.59/lb., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a surge valve at a cost of $1,800. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the surge irrigation is provided in Table 41-2-A, followed by a cash flow summary (Table 41-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 41-3 and Figure 41-1. Table 41-3

presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $33,800 over the 10-year period and cash costs average just under $22,000. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. NCFI increases throughout the 10-year period from $8,790 in 2006 to over $14,000 in 2015 (Table 41-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI (Figure 41-1) could range as much as $8,000 plus or minus the average expected NCFI for the site. Cash reserves are expected to grow throughout the 10-year projection period and reach $121,650 by 2015 (Table 41-3). The average cash flow balances (Table 41-3) are intended to illustrate the cash requirements or flows generated using the surge irrigation method.

Table 41-1. Cotton, Surge Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr
PLANTED ACRES	38.5	38.5
BASE ACRES	35	0
YIELD UNITS	lb	ton
BUDGETING YIELD	1047	0.79
FARM PROG YLD DIR	650	0
FARM PROG YLD CCP	650	0
PRICES/YIELD UNIT	0.51	95.81
VARIABLE PRODUCTION COSTS ($/ACRE)		
SEED	18	0
FERTILIZER	26	0
HERBICIDES	15	0
INSECTICIDES	65	0
FUNGICIDES	0	0
CUSTOM APPLICATION	3.5	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	53	0
TILLAGE/HARVST FUEL	36	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.13	0
HARVEST COST/ACRE	94	0
BOLL WEEVIL COST/ACRE	28	0
LABOR COST /ACRE	20	0
CROP INSURANCE		
YIELD ELECTION (FRACTION)	0.65	0
YIELD COVERAGE GUARANTEE	633.75	0
PRICE ELECTION (FRACTION)	1	0
PRICE GUARANTEE	0.5115	0
PREMIUM RATE ($/ACRE)	8.25	0
PREMIUM COSTS	317.625	0

Table 41-2-A. Cotton, Surge Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	23,472	24,726	26,198	26,732	27,205	28,131	28,576	28,992	29,428	29,838
DECOUPLED DIRECT PAYMENTS	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290
DECOUPLED CCPs	2,654	2,562	2,296	2,071	1,977	1,971	1,902	1,822	1,811	1,805
MARKETING LOAN PAYMENTS	3,848	3,150	2,729	2,491	2,562	2,511	2,345	2,333	2,395	2,348
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**31,264**	**31,727**	**32,513**	**32,584**	**33,033**	**33,904**	**34,112**	**34,437**	**34,924**	**35,281**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	693	703	694	701	711	722	729	738	745	751
FERTILIZER COSTS	1,001	1,007	996	984	998	1,006	1,013	1,030	1,046	1,056
HERBICIDE COSTS	578	576	569	574	580	585	591	599	605	610
INSECTICIDE COSTS	2,502	2,467	2,407	2,441	2,484	2,524	2,563	2,599	2,624	2,637
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	135	133	125	121	118	115	114	115	117	119
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	2,040	2,013	1,896	1,834	1,784	1,746	1,727	1,747	1,775	1,802
FUEL & LUBE COSTS	1,386	1,367	1,288	1,246	1,212	1,186	1,173	1,187	1,206	1,224
HARVESTING COSTS	8,859	8,818	8,384	8,186	8,036	7,938	7,926	8,096	8,305	8,509
CROP INSURANCE PREMIUMS	318	318	318	318	318	318	318	318	318	318
BOLL WEEVIL COSTS	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078
HIRED LABOR COSTS	770	793	819	842	862	885	908	929	951	973
SUB-TOTAL OF PROD COSTS	19,360	19,272	18,573	18,325	18,179	18,104	18,138	18,436	18,769	19,077
CASH RENT FOR CROPLAND	2,888	2,888	2,888	2,888	2,888	2,888	2,888	2,888	2,888	2,888
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Surge Valve	180	180	180	180	180	180	180	180	180	180
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	22,428	22,340	21,641	21,392	21,247	21,171	21,206	21,503	21,836	22,144
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	7	2	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**22,428**	**22,346**	**21,642**	**21,392**	**21,247**	**21,171**	**21,206**	**21,503**	**21,836**	**22,144**
NET CASH FARM INCOME	**8,836**	**9,381**	**10,871**	**11,192**	**11,787**	**12,732**	**12,906**	**12,934**	**13,087**	**13,137**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**8,836**	**9,381**	**10,871**	**11,192**	**11,787**	**12,732**	**12,906**	**12,934**	**13,087**	**13,136**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	812	824	844	846	858	881	886	894	907	916
CASH EXPENSES ($/ACRE)	583	580	562	556	552	550	551	559	567	575
NET CASH INCOME ($/ACRE)	230	244	282	291	306	331	335	336	340	341

Table 41-2-B. Cotton, Surge Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**8,836**	**18,218**	**29,092**	**40,289**	**52,085**	**64,838**	**77,788**	**90,802**	**104,017**
PLUS:										
NET CASH FARM INCOME	8,836	9,381	10,871	11,192	11,787	12,732	12,906	12,934	13,087	13,137
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	1	3	6	9	21	43	80	128	186
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**8,836**	**18,218**	**29,092**	**40,289**	**52,085**	**64,838**	**77,788**	**90,802**	**104,017**	**117,340**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	8,836	18,218	29,092	40,289	52,085	64,838	77,788	90,802	104,017	117,340
ENDING YEAR CASH RESERVE	**8,836**	**18,218**	**29,092**	**40,289**	**52,085**	**64,838**	**77,788**	**90,802**	**104,017**	**117,340**

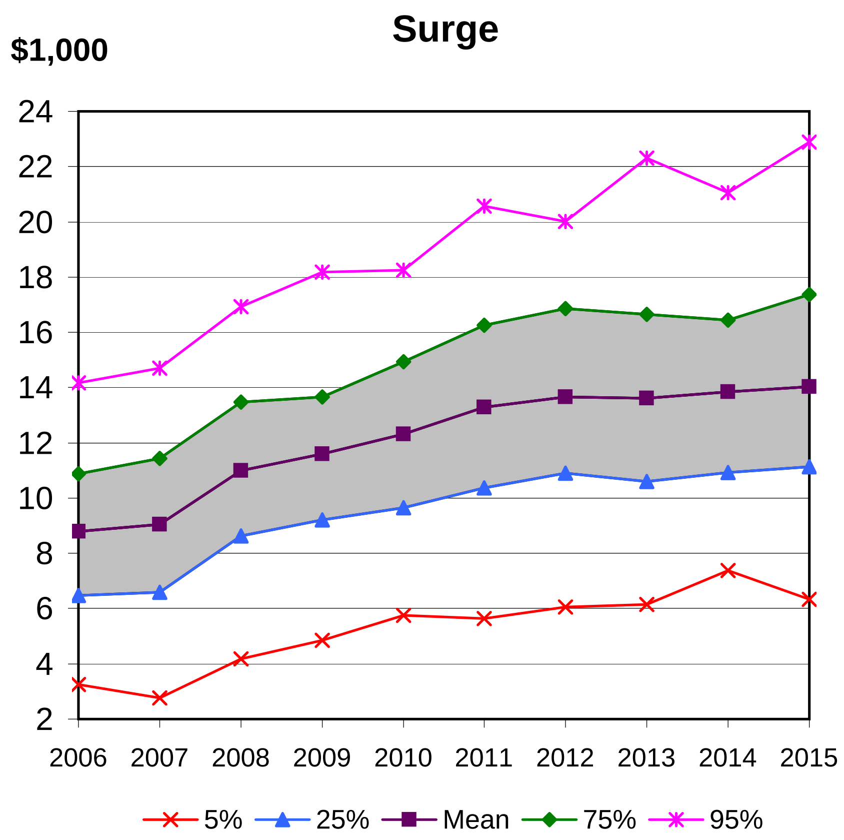
Table 41-3. Cotton, Surge Irrigation Demonstration

	Surge
Total Cash Receipts ($1000)	
2006	31.21
2007	31.38
2008	32.65
2009	33.00
2010	33.56
2011	34.44
2012	34.90
2013	35.09
2014	35.67
2015	36.20
2006-2015 Average	**33.81**
Total Cash Costs ($1000)	
2006	22.43
2007	22.34
2008	21.65
2009	21.40
2010	21.26
2011	21.17
2012	21.23
2013	21.48
2014	21.83
2015	22.16
2006-2015 Average	**21.69**
Net Cash Farm Income ($1000)	
2006	8.79
2007	9.04
2008	11.00
2009	11.60
2010	12.31
2011	13.28
2012	13.67
2013	13.61
2014	13.84
2015	14.04
2006-2015 Average	**12.12**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 41-3. Cotton, Surge Irrigation Demonstration

	Surge
Ending Cash Reserves ($1000)	
2006	8.79
2007	17.83
2008	28.83
2009	40.43
2010	52.75
2011	66.05
2012	79.76
2013	93.45
2014	107.42
2015	121.65
2006-2015 Average	**61.69**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.73
2007	0.72
2008	0.67
2009	0.66
2010	0.64
2011	0.63
2012	0.62
2013	0.62
2014	0.62
2015	0.62
2006-2015 Average	**0.65**

Figure 41-1. Projected Variability in Net Cash Farm Income for Cotton, Surge Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Sites 42A & 42B: Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe

The basic costs of production assumptions for the cotton and grain sorghum surge irrigation with poly-pipe demonstration are given in Tables 42-1 and 42-2. For the purpose of presenting economic viability and outlook for the 94-acre cotton and 66-acre grain sorghum sites, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 94 acres of cotton and 66 acres of grain sorghum production. It is assumed the cotton and grain sorghum acreage is rotated annually. The analysis assumes a $1,800 cost for a surge valve. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing cost. The initial cotton price is $.56/lb. and the grain sorghum price is $5.00/cwt., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the baseline is provided in Table 42-3-A, followed by a cash flow summary (Table 42-3-B). The income and cash flow statement results from the simplistic (no risk) forecast assuming average prices and yields. Tables 42-4-1 and 42-4-2 give revenue and expense summaries for the two individual crops. A more comprehensive projection, including price and yield risk, is illustrated in Table 42-5 and Figures 42-1 & 42-2. Table 42-5 presents the average outcomes for selected financial projections, while the graphical presentations illustrate the full range of possibilities for Net Cash Farm Income (NCFI) and cash flow requirements. Total cash receipts average just over $92,000 initially and fluctuate from year-to-year as planted acreages rotate from cotton to grain sorghum production. Peak cash receipt years reflect those years where cotton plantings are the highest. In addition to market receipts, total receipts for the 160 acres include direct and counter-cyclical payments paid to base acres. Cash costs also reflect the cotton to grain sorghum rotation cycle, requiring roughly $65,270 in the initial year and $56,020 in 2007. NCFI generally follows the cotton to grain sorghum rotation cycle producing $27,690 profit in the initial year and averages $27,680 over the 10-year period. The risk associated with prices and yields suggests that, in a normal production year, NCFI (Figure 42-1) could range as much as $14,000 to $16,000 plus or minus the average expected NCFI. Cash reserves are expected to grow throughout the 10-year projection period Figure 42-2. The average cash flow balances (Figure 42-2) are intended to illustrate the cash requirements or positive flows generated by the crop enterprises.

Table 42-1. Cotton, Surge Irrigation with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr	Y Corn Irr
PLANTED ACRES	94	94	0
BASE ACRES	112.22	0	3.07
YIELD UNITS	lb	ton	bu
BUDGETING YIELD	1000	0.75	0
FARM PROG YLD DIR	668	0	96
FARM PROG YLD CCP	668	0	96
PRICES/YIELD UNIT	0.44	99.07	2.1
VARIABLE PRODUCTION COSTS ($/ACRE)			
SEED	22.5	0	0
FERTILIZER	88.13	0	0
HERBICIDES	5.07	0	0
INSECTICIDES	0	0	0
FUNGICIDES	0	0	0
CUSTOM APPLICATION	50.74	0	0
SCOUTING / OTHER	0	0	0
IRRIGATION FUEL	48.44	0	0
TILLAGE/HARVST FUEL	10.74	0	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.21	0	0
HARVEST COST/ACRE	13	0	0
BOLL WEEVIL COST/ACRE	28	0	0
LABOR COST /ACRE	38.89	0	0
CROP INSURANCE			
YIELD ELECTION (FRACTION)	0.65	0	0
YIELD COVERAGE GUARANTEE	664.625	0	0
PRICE ELECTION (FRACTION)	1	0	0
PRICE GUARANTEE	0.4788	0	0
PREMIUM RATE ($/ACRE)	12.3	0	0
PREMIUM COSTS	1156.2001	0	0

Table 42-2. Grain Sorghum, Surge Irrigaiton with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Sorghm Irr
PLANTED ACRES	66
BASE ACRES	11.2
YIELD UNITS	cwt
BUDGETING YIELD	60
FARM PROG YLD DIR	36.96
FARM PROG YLD CCP	36.96
PRICES/YIELD UNIT	4.68
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	13.26
FERTILIZER	48.87
HERBICIDES	3.85
INSECTICIDES	0
FUNGICIDES	0
CUSTOM APPLICATION	27.21
SCOUTING / OTHER	0
IRRIGATION FUEL	49.09
TILLAGE/HARVST FUEL	5.01
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.6
HARVEST COST/ACRE	8.3
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	34.18
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.65
YIELD COVERAGE GUARANTEE	39.1625
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	3.4373
PREMIUM RATE ($/ACRE)	9
PREMIUM COSTS	594

Table 42 - 3 - A. Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstratio

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	66,877	62,963	71,833	65,479	74,279	68,296	77,325	70,510	78,894	71,058
DECOUPLED DIRECT PAYMENTS	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540
DECOUPLED CCPs	9,003	8,967	8,921	8,811	8,447	7,796	7,147	6,541	6,182	6,109
MARKETING LOAN PAYMENTS	12,790	8,011	9,269	5,870	7,474	4,720	5,940	3,736	5,251	3,632
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**93,210**	**84,481**	**94,563**	**84,700**	**94,741**	**85,351**	**94,953**	**85,328**	**94,867**	**85,339**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	2,990	2,769	3,067	2,849	3,168	2,945	3,275	3,032	3,367	3,119
FERTILIZER COSTS	11,510	10,070	10,834	9,907	11,174	10,344	11,666	10,752	12,093	11,127
HERBICIDE COSTS	731	689	719	691	732	708	755	730	776	750
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	6,565	5,734	6,209	5,638	6,350	5,809	6,558	5,993	6,783	6,215
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	7,793	7,583	7,370	7,456	7,537	7,683	7,785	7,926	8,052	8,219
FUEL & LUBE COSTS	1,340	1,145	1,267	1,126	1,296	1,160	1,339	1,197	1,385	1,241
HARVESTING COSTS	23,886	18,387	22,732	18,195	23,397	18,868	24,320	19,588	25,316	20,444
CROP INSURANCE PREMIUMS	1,750	1,658	1,750	1,658	1,750	1,658	1,750	1,658	1,750	1,658
BOLL WEEVIL COSTS	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848
HIRED LABOR COSTS	5,912	5,932	6,231	6,244	6,551	6,576	6,913	6,941	7,299	7,342
SUB-TOTAL OF PROD COSTS	65,109	55,815	62,811	55,609	64,588	57,599	66,993	59,664	69,453	61,963
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
OTHEREXPENSE	180	180	180	180	180	180	180	180	180	180
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	65,289	55,995	62,991	55,789	64,768	57,779	67,173	59,844	69,633	62,143
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	11	6	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**65,289**	**56,006**	**62,997**	**55,789**	**64,768**	**57,779**	**67,173**	**59,844**	**69,633**	**62,143**
NET CASH FARM INCOME	**27,921**	**28,475**	**31,566**	**28,911**	**29,972**	**27,572**	**27,780**	**25,484**	**25,235**	**23,196**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**27,921**	**28,475**	**31,566**	**28,911**	**29,972**	**27,572**	**27,780**	**25,484**	**25,235**	**23,195**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	583	528	591	529	592	533	593	533	593	533
CASH EXPENSES ($/ACRE)	408	350	394	349	405	361	420	374	435	388
NET CASH INCOME ($/ACRE)	175	178	197	181	187	172	174	159	158	145

Table 42 - 3 - B. Cotton & Grain Sorghum, Surge Irrigaiton with Poly-Pipe Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**27,921**	**56,400**	**87,983**	**116,942**	**147,024**	**174,809**	**202,900**	**228,850**	**254,725**
PLUS:										
NET CASH FARM INCOME	27,921	28,475	31,566	28,911	29,972	27,572	27,780	25,484	25,235	23,196
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	4	17	48	110	213	311	467	640	872
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**27,921**	**56,400**	**87,983**	**116,942**	**147,024**	**174,809**	**202,900**	**228,850**	**254,725**	**278,794**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	27,921	56,400	87,983	116,942	147,024	174,809	202,900	228,850	254,725	278,794
ENDING YEAR CASH RESERVE	**27,921**	**56,400**	**87,983**	**116,942**	**147,024**	**174,809**	**202,900**	**228,850**	**254,725**	**278,794**

Table 42 - 4 - 1. Cotton, Surge Irrigation with Poly-Pipe Demonstration

REVENUE AND EXPENSE SUMMARY.

Cotton

YEARS 2006 - 2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
UNIT 1. INCOME (NET OF SHARE LEASE)										
VALUE OF CROPS PRODUCED	48,344	35,900	52,281	36,898	53,774	38,636	56,300	40,337	57,627	40,597
DIRECT PAYMENTS	4,320	4,320	4,320	4,320	4,320	4,320	4,320	4,320	4,320	4,320
COUNTER-CYCLICAL PAYMENTS	8,833	8,805	8,786	8,715	8,388	7,765	7,134	6,538	6,182	6,109
MARKETING LOAN PAYMENTS	11,524	6,745	8,790	5,761	7,474	4,720	5,940	3,736	5,251	3,632
CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
OTHER ANNUAL FARM INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL UNIT REVENUE	**73,022**	**55,770**	**74,177**	**55,694**	**73,956**	**55,441**	**73,695**	**54,931**	**73,380**	**54,658**
UNIT EXPENSES (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	2,115	1,506	2,169	1,549	2,241	1,601	2,317	1,648	2,381	1,696
FERTILIZER COSTS	8,284	5,626	7,798	5,535	8,043	5,780	8,396	6,007	8,704	6,217
HERBICIDE COSTS	477	331	469	332	478	340	492	350	506	360
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATIONS	4,770	3,251	4,510	3,196	4,613	3,294	4,764	3,398	4,928	3,524
SCOUTING / OTHER COSTS	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	4,553	3,103	4,306	3,051	4,404	3,144	4,548	3,244	4,704	3,364
FUEL & LUBE COSTS	1,010	688	955	677	976	697	1,008	719	1,043	746
HARVESTING COSTS	20,962	14,333	19,950	14,183	20,534	14,708	21,345	15,271	22,219	15,939
CROP INSURANCE PREMIUMS	1,156	812	1,156	812	1,156	812	1,156	812	1,156	812
BOLL WEEVIL PROGRAM COSTS	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848
HIRED LABOR	3,656	2,635	3,853	2,773	4,051	2,920	4,275	3,082	4,514	3,261
SUB-TOTAL CROP EXPENSES	49,614	34,132	47,798	33,956	49,128	35,145	50,935	36,380	52,788	37,766
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT STATE/PRIVATE PASTURE	0	0	0	0	0	0	0	0	0	0
RENT STOCKER PASTURE	0	0	0	0	0	0	0	0	0	0
UNIT EXPENSES	**49,614**	**34,132**	**47,798**	**33,956**	**49,128**	**35,145**	**50,935**	**36,380**	**52,788**	**37,766**
UNIT CONTRIBUTION TO UNALLOCATED OVERHEAD/FIXED COSTS	**23,407**	**21,638**	**26,378**	**21,739**	**24,828**	**20,296**	**22,760**	**18,551**	**20,592**	**16,893**
ALLOCATION OF OVERHEAD EXPENSES										
HIRED LABOR	0	0	0	0	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
OTHER FARM EXPENSES	141	119	141	118	141	117	140	116	139	115
CROP STORAGE COSTS	0	0	0	0	0	0	0	0	0	0
CONSERVATION & ENVIRONMENT	0	0	0	0	0	0	0	0	0	0
INTEREST COST LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST COST INTERMEDIATE	0	0	0	0	0	0	0	0	0	0
INTEREST COST OPERATING DEBT	0	7	5	0	0	0	0	0	0	0
INTEREST COST CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	0	0	0	0	0	0
TOTAL ALLOCATED EXPENSES	**141**	**126**	**146**	**118**	**141**	**117**	**140**	**116**	**139**	**116**
UNIT NET INCOME	**23,266**	**21,512**	**26,233**	**21,620**	**24,688**	**20,179**	**22,620**	**18,435**	**20,453**	**16,777**

Table 42 - 4 - 2. Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstration

REVENUE AND EXPENSE SUMMARY.

Grain Sorghum

YEARS 2006 - 2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
UNIT 2. INCOME (NET OF SHARE LEASE)										
VALUE OF CROPS PRODUCED	18,533	27,063	19,553	28,581	20,506	29,660	21,025	30,173	21,268	30,461
DIRECT PAYMENTS	220	220	220	220	220	220	220	220	220	220
COUNTER-CYCLICAL PAYMENTS	170	162	135	95	59	30	13	3	0	0
MARKETING LOAN PAYMENTS	1,266	1,266	478	109	0	0	0	0	0	0
CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
OTHER ANNUAL FARM INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL UNIT REVENUE	**20,189**	**28,711**	**20,386**	**29,006**	**20,785**	**29,911**	**21,258**	**30,396**	**21,488**	**30,681**
UNIT EXPENSES (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	875	1,264	898	1,300	927	1,344	959	1,384	985	1,423
FERTILIZER COSTS	3,225	4,444	3,036	4,372	3,131	4,565	3,269	4,744	3,389	4,910
HERBICIDE COSTS	254	358	250	359	255	368	263	379	270	390
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATIONS	1,796	2,483	1,698	2,441	1,737	2,516	1,794	2,595	1,855	2,691
SCOUTING / OTHER COSTS	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	3,240	4,479	3,064	4,404	3,133	4,538	3,236	4,682	3,347	4,855
FUEL & LUBE COSTS	331	457	313	449	320	463	330	478	342	496
HARVESTING COSTS	2,924	4,055	2,782	4,012	2,863	4,159	2,975	4,317	3,097	4,505
CROP INSURANCE PREMIUMS	594	846	594	846	594	846	594	846	594	846
BOLL WEEVIL PROGRAM COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR	2,256	3,298	2,378	3,471	2,500	3,656	2,638	3,858	2,786	4,082
SUB-TOTAL CROP EXPENSES	15,495	21,683	15,012	21,654	15,460	22,454	16,058	23,284	16,665	24,198
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT STATE/PRIVATE PASTURE	0	0	0	0	0	0	0	0	0	0
RENT STOCKER PASTURE	0	0	0	0	0	0	0	0	0	0
UNIT EXPENSES	**15,495**	**21,683**	**15,012**	**21,654**	**15,460**	**22,454**	**16,058**	**23,284**	**16,665**	**24,198**
UNIT CONTRIBUTION TO UNALLOCATED OVERHEAD/FIXED COSTS	**4,694**	**7,028**	**5,373**	**7,352**	**5,324**	**7,456**	**5,200**	**7,113**	**4,823**	**6,484**
ALLOCATION OF OVERHEAD EXPENSES										
HIRED LABOR	0	0	0	0	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
OTHER FARM EXPENSES	39	61	39	62	39	63	40	64	41	65
CROP STORAGE COSTS	0	0	0	0	0	0	0	0	0	0
CONSERVATION & ENVIRONMENT	0	0	0	0	0	0	0	0	0	0
INTEREST COST LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST COST INTERMEDIATE	0	0	0	0	0	0	0	0	0	0
INTEREST COST OPERATING DEBT	0	4	1	0	0	0	0	0	0	0
INTEREST COST CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	0	0	0	0	0	0
TOTAL ALLOCATED EXPENSES	**39**	**65**	**40**	**62**	**39**	**63**	**40**	**64**	**41**	**65**
UNIT NET INCOME	**4,655**	**6,963**	**5,333**	**7,290**	**5,285**	**7,393**	**5,160**	**7,049**	**4,782**	**6,419**

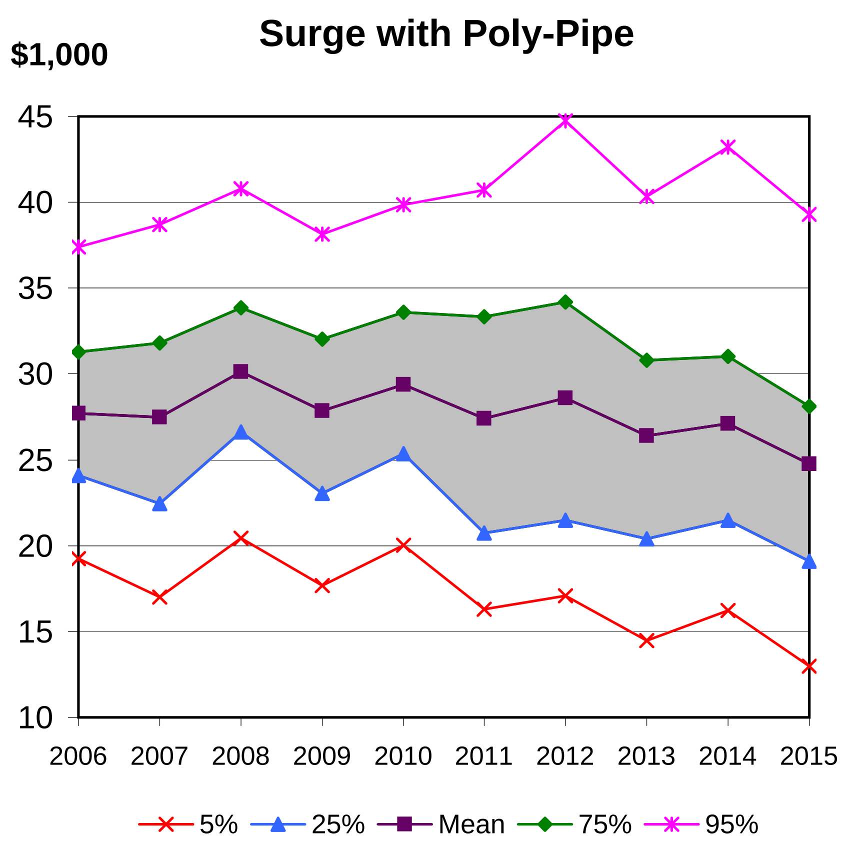
Table 42-5. Cotton & Grain Sorghum, Surge Irrigation Demonstration

	Surge
Total Crop Receipts ($1000)	
2006	92.96
2007	83.49
2008	93.12
2009	83.65
2010	94.16
2011	85.17
2012	95.79
2013	86.21
2014	96.73
2015	86.95
2006-2015 Average	**89.82**
Total Cash Costs ($1000)	
2006	65.27
2007	56.02
2008	62.98
2009	55.78
2010	64.76
2011	57.76
2012	67.20
2013	59.80
2014	69.62
2015	62.19
2006-2015 Average	**62.14**
Net Cash Farm Income ($1000)	
2006	27.69
2007	27.47
2008	30.14
2009	27.87
2010	29.39
2011	27.40
2012	28.59
2013	26.41
2014	27.11
2015	24.76
2006-2015 Average	**27.68**
Ending Cash Reserves ($1000)	
2006	27.69
2007	55.16
2008	85.32
2009	113.24
2010	142.74
2011	170.35
2012	199.24
2013	226.10
2014	253.84
2015	279.47
2006-2015 Average	**155.31**

Table 42-5. Cotton & Grain Sorghum, Surge Irrigation Demonstration

	Surge
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.70
2007	0.67
2008	0.68
2009	0.67
2010	0.69
2011	0.68
2012	0.71
2013	0.70
2014	0.73
2015	0.72
2006-2015 Average	**0.70**

Figure 42-1. Projected Variability in Net Cash Farm Income for Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstration.

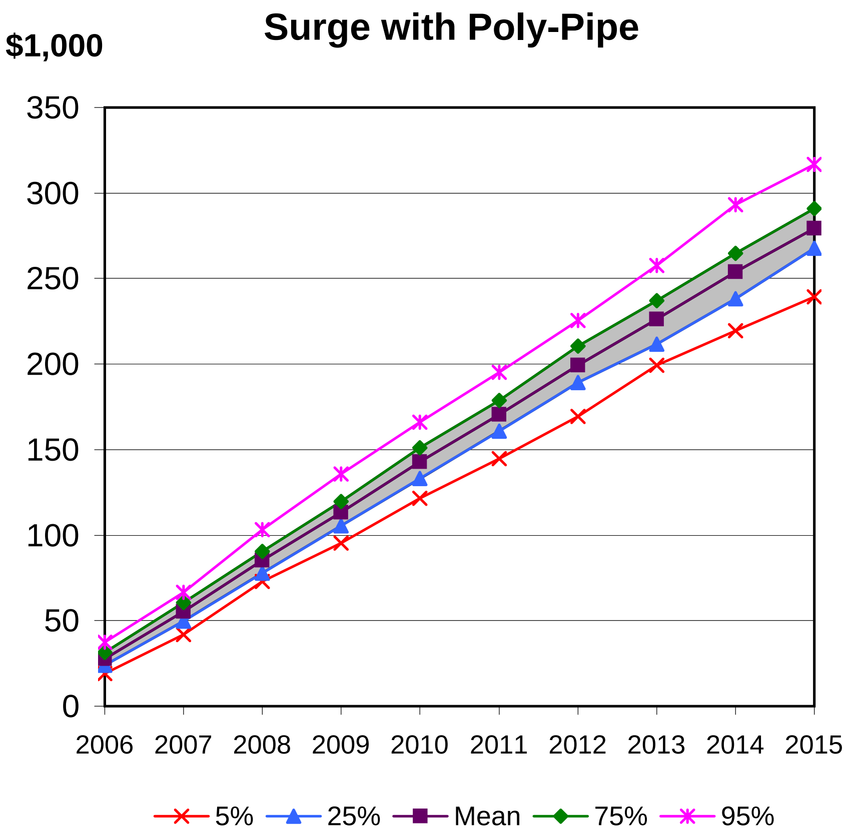


Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance

Helping Agriculture Make Informed Decisions

Figure 42-2. Projected Variability in Ending Cash Reserves for Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Sites 43A & 43B: Cotton, Furrow with Poly-Pipe vs. Drip Irrigation

The basic costs of production assumptions for the cotton furrow with poly-pipe vs. drip demonstration are given in Tables 43-1 and 43-2. For the purpose of presenting economic viability and outlook for the 38-acre furrow and 17-acre drip sites, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38 acres of furrow and 17 acres of drip cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.56/lb., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the furrow irrigation is provided in Table 43-3-A, followed by a cash flow summary (Table 43-3-B). Drip results are provided in Tables 43-4-A and 43-4-B. These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 43-5 and Figures 43-1. Table 43-5 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Because the furrow and drip plots were not equal in acreages, a per-acre analysis reflects a more accurate comparison of key indicators. Total cash receipts average about $590 per acre for both irrigation methods. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Due primarily to the required replacement of drip tape every two years, cash costs average $530 per acre fro the drip compared to $400 per acre for the furrow irrigation. Peak cash cost years reflect those years where drip tape is replaced. NCFI on a per acre for the furrow plot averages $190 per acre, over three times higher than for the drip plot. The risk associated with prices and yields suggests that, in a normal production year, NCFI (Figure 43-1) could range as much as $5,000 ($132 per acre) plus or minus the average expected NCFI for the furrow site. However, for the drip site, NCFI is projected to be highly volatile with a higher probability of being negative. Cash reserves are expected to grow throughout the 10-year projection period for the furrow site (Table 43-5). Ending cash reserves for the furrow site are projected to reach $70,960, substantially higher than the $5,560 for the drip site. The average cash flow balances (Table 43-5) are intended to illustrate the cash requirements or flows generated by the two irrigation methods.

Table 43-1. Cotton, Furrow Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr
PLANTED ACRES	38	38
BASE ACRES	29.91	0
YIELD UNITS	lb	ton
BUDGETING YIELD	1000	0.75
FARM PROG YLD DIR	959	0
FARM PROG YLD CCP	959	0
PRICES/YIELD UNIT	0.44	99.07
VARIABLE PRODUCTION COSTS ($/ACRE)		
SEED	31.29	0
FERTILIZER	36.05	0
HERBICIDES	15	0
INSECTICIDES	40	0
FUNGICIDES	0	0
CUSTOM APPLICATION	30	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	51	0
TILLAGE/HARVST FUEL	17.77	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.15	0
HARVEST COST/ACRE	10	0
BOLL WEEVIL COST/ACRE	28	0
LABOR COST /ACRE	30	0
LANDLORDS SHARE FRACTIONS		
CROP PRODUCTION	0.25	0.25
SEED	0	0
FERTILIZER	0.25	0
HERBICIDES	0	0
INSECTICIDES	0.25	0
FUNGICIDES	0	0
CUSTOM APPLICATION	0	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	0	0
TILL/HARVEST FUEL	0	0
HARVEST, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.25	0
HARVEST COST/ACRE	0	0
BOLL WEEVIL COST/ACRE	0	0
LABOR COST /ACRE	0	0
CROP INSURANCE		
YIELD ELECTION (FRACTION)	0.65	0
YIELD COVERAGE GUARANTEE	505.57	0
PRICE ELECTION (FRACTION)	1	0
PRICE GUARANTEE	0.4788	0
PREMIUM RATE ($/ACRE)	11.1	0
PREMIUM COSTS	421.8	0

Table 43-2. Cotton, Drip Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr
PLANTED ACRES	17	17
BASE ACRES	13.44	0
YIELD UNITS	lb	ton
BUDGETING YIELD	1000	0.75
FARM PROG YLD DIR	959	0
FARM PROG YLD CCP	959	0
PRICES/YIELD UNIT	0.44	99.07
VARIABLE PRODUCTION COSTS ($/ACRE)		
SEED	31.29	0
FERTILIZER	36.05	0
HERBICIDES	15	0
INSECTICIDES	40	0
FUNGICIDES	0	0
CUSTOM APPLICATION	30	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	60	0
TILLAGE/HARVST FUEL	17.77	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.15	0
HARVEST COST/ACRE	10	0
BOLL WEEVIL COST/ACRE	28	0
LABOR COST /ACRE	30	0
LANDLORDS SHARE FRACTIONS		
CROP PRODUCTION	0.25	0.25
SEED	0	0
FERTILIZER	0.25	0
HERBICIDES	0	0
INSECTICIDES	0.25	0
FUNGICIDES	0	0
CUSTOM APPLICATION	0	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	0	0
TILL/HARVEST FUEL	0	0
HARVEST, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.25	0
HARVEST COST/ACRE	0	0
BOLL WEEVIL COST/ACRE	0	0
LABOR COST /ACRE	0	0
CROP INSURANCE		
YIELD ELECTION (FRACTION)	0.65	0
YIELD COVERAGE GUARANTEE	505.57	0
PRICE ELECTION (FRACTION)	1	0
PRICE GUARANTEE	0.4788	0
PREMIUM RATE ($/ACRE)	11.1	0
PREMIUM COSTS	188.7	0

Table 43 - 3 - A. Cotton, Furrow Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	14,658	15,502	15,851	15,933	16,304	16,684	17,070	17,418	17,472	17,530
DECOUPLED DIRECT PAYMENTS	1,401	1,401	1,401	1,401	1,401	1,401	1,401	1,401	1,401	1,401
DECOUPLED CCPs	2,685	2,649	2,616	2,563	2,441	2,243	2,054	1,878	1,774	1,753
MARKETING LOAN PAYMENTS	3,494	2,912	2,665	2,488	2,266	2,038	1,801	1,613	1,592	1,568
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**22,237**	**22,465**	**22,533**	**22,385**	**22,412**	**22,366**	**22,326**	**22,311**	**22,239**	**22,253**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	1,189	1,206	1,220	1,240	1,260	1,282	1,302	1,320	1,339	1,358
FERTILIZER COSTS	1,027	994	967	978	997	1,021	1,041	1,061	1,079	1,098
HERBICIDE COSTS	570	564	561	565	571	580	589	597	605	614
INSECTICIDE COSTS	1,140	1,135	1,137	1,153	1,172	1,194	1,218	1,240	1,262	1,284
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	1,140	1,107	1,078	1,088	1,103	1,121	1,139	1,157	1,178	1,199
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,938	1,881	1,833	1,850	1,874	1,906	1,936	1,966	2,002	2,039
FUEL & LUBE COSTS	675	655	639	645	653	664	675	685	698	711
HARVESTING COSTS	4,655	4,533	4,430	4,485	4,559	4,650	4,738	4,827	4,931	5,037
CROP INSURANCE PREMIUMS	422	422	422	422	422	422	422	422	422	422
BOLL WEEVIL COSTS	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064
HIRED LABOR COSTS	1,140	1,170	1,202	1,231	1,263	1,297	1,333	1,369	1,408	1,448
SUB-TOTAL OF PROD COSTS	14,961	14,730	14,551	14,720	14,938	15,201	15,457	15,708	15,988	16,274
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	14,961	14,730	14,551	14,720	14,938	15,201	15,457	15,708	15,988	16,274
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	3	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**14,961**	**14,733**	**14,551**	**14,720**	**14,938**	**15,201**	**15,457**	**15,708**	**15,988**	**16,274**
NET CASH FARM INCOME	**7,277**	**7,732**	**7,982**	**7,665**	**7,474**	**7,165**	**6,869**	**6,603**	**6,251**	**5,979**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**7,277**	**7,732**	**7,982**	**7,665**	**7,474**	**7,165**	**6,869**	**6,603**	**6,251**	**5,978**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	585	591	593	589	590	589	588	587	585	586
CASH EXPENSES ($/ACRE)	394	388	383	387	393	400	407	413	421	428
NET CASH INCOME ($/ACRE)	191	203	210	202	197	189	181	174	165	157

Table 43 - 3 - B. Cotton, Furrow Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**7,277**	**15,010**	**22,997**	**30,675**	**38,179**	**45,399**	**52,351**	**59,074**	**65,493**
PLUS:										
NET CASH FARM INCOME	7,277	7,732	7,982	7,665	7,474	7,165	6,869	6,603	6,251	5,979
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	1	5	13	30	55	83	120	169	224
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**7,277**	**15,010**	**22,997**	**30,675**	**38,179**	**45,399**	**52,351**	**59,074**	**65,493**	**71,696**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	7,277	15,010	22,997	30,675	38,179	45,399	52,351	59,074	65,493	71,696
ENDING YEAR CASH RESERVE	**7,277**	**15,010**	**22,997**	**30,675**	**38,179**	**45,399**	**52,351**	**59,074**	**65,493**	**71,696**

Table 43 - 4 - A. Cotton, Drip Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	6,557	6,935	7,091	7,128	7,294	7,464	7,636	7,792	7,816	7,843
DECOUPLED DIRECT PAYMENTS	630	630	630	630	630	630	630	630	630	630
DECOUPLED CCPs	1,206	1,190	1,175	1,152	1,097	1,008	923	844	797	788
MARKETING LOAN PAYMENTS	1,563	1,303	1,192	1,113	1,014	912	806	722	712	702
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**9,956**	**10,058**	**10,088**	**10,022**	**10,034**	**10,013**	**9,995**	**9,988**	**9,955**	**9,962**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	532	539	546	555	564	573	583	590	599	607
FERTILIZER COSTS	460	445	433	437	446	457	466	475	483	491
HERBICIDE COSTS	255	252	251	253	256	259	264	267	271	275
INSECTICIDE COSTS	510	508	509	516	524	534	545	555	565	574
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	510	495	482	487	493	502	509	517	527	537
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,020	990	965	974	986	1,003	1,019	1,035	1,054	1,073
FUEL & LUBE COSTS	302	293	286	288	292	297	302	307	312	318
HARVESTING COSTS	2,082	2,028	1,982	2,006	2,039	2,080	2,120	2,160	2,206	2,254
CROP INSURANCE PREMIUMS	189	189	189	189	189	189	189	189	189	189
BOLL WEEVIL COSTS	476	476	476	476	476	476	476	476	476	476
HIRED LABOR COSTS	510	523	538	551	565	580	596	612	630	648
SUB-TOTAL OF PROD COSTS	6,846	6,738	6,654	6,731	6,831	6,951	7,068	7,183	7,311	7,442
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Drip Tape	4,080	0	4,080	0	4,080	0	4,080	0	4,080	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	10,926	6,738	10,734	6,731	10,911	6,951	11,148	7,183	11,391	7,442
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	3	10	8	19	17	26	21	32	23
INTEREST ON CARRYOVER DEBT	0	4	3	5	0	0	0	0	0	0
TOTAL CASH EXPENSES	**10,926**	**6,745**	**10,747**	**6,745**	**10,930**	**6,968**	**11,174**	**7,203**	**11,422**	**7,464**
NET CASH FARM INCOME	**-969**	**3,314**	**-658**	**3,277**	**-896**	**3,045**	**-1,179**	**2,784**	**-1,467**	**2,497**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	-288	-533	-453	-385	-336	-336	-336	-336	-336	-336
NET FARM INCOME	**-1,257**	**2,781**	**-1,111**	**2,892**	**-1,231**	**2,709**	**-1,515**	**2,449**	**-1,802**	**2,161**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	586	592	593	590	590	589	588	588	586	586
CASH EXPENSES ($/ACRE)	643	397	632	397	643	410	657	424	672	439
NET CASH INCOME ($/ACRE)	-57	195	-39	193	-53	179	-69	164	-86	147

Table 43 - 4 - B. Cotton, Drip Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**0**	**0**	**0**	**1,123**	**228**	**3,273**	**2,098**	**4,885**	**3,426**
PLUS:										
NET CASH FARM INCOME	-969	3,314	-658	3,277	-896	3,045	-1,179	2,784	-1,467	2,497
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	0	0	0	1	0	4	3	8	7
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**-969**	**3,314**	**-658**	**3,277**	**228**	**3,273**	**2,098**	**4,885**	**3,426**	**5,930**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	3,840	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	4,809	1,496	2,154	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**3,840**	**4,809**	**1,496**	**2,154**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	-4,809	-1,496	-2,154	1,123	228	3,273	2,098	4,885	3,426	5,930
ENDING YEAR CASH RESERVE	**0**	**0**	**0**	**1,123**	**228**	**3,273**	**2,098**	**4,885**	**3,426**	**5,930**

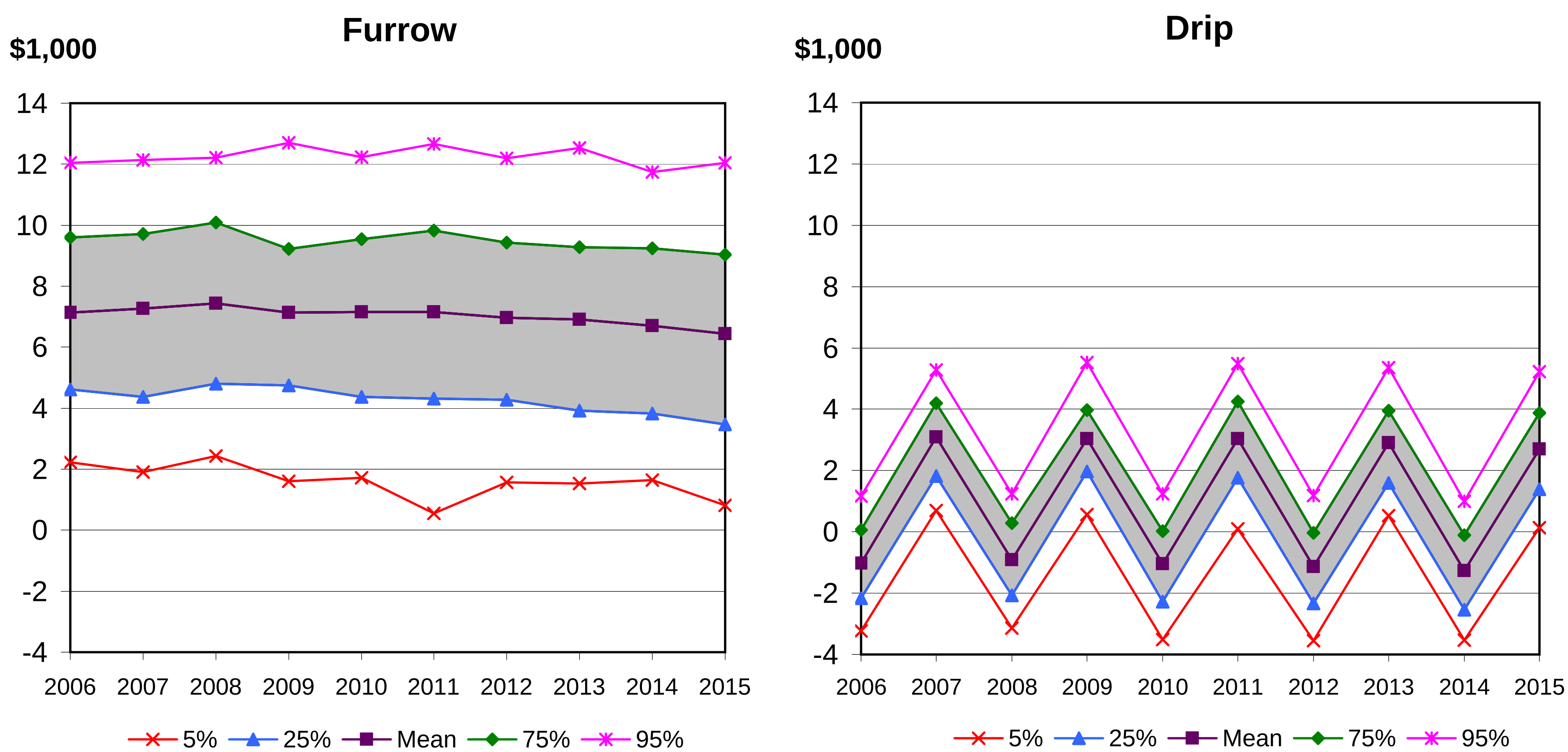
Table 43-5. Cotton, Furrow & Drip Irrigation Demonstration

	Furrow		Drip	
	Total (38 acres)	Per Acre	Total (17 acres)	Per Acre
Total Cash Receipts ($1000)				
2006	22.11	0.58	9.90	0.58
2007	22.00	0.58	9.85	0.58
2008	21.98	0.58	9.84	0.58
2009	21.86	0.58	9.79	0.58
2010	22.10	0.58	9.89	0.58
2011	22.37	0.59	10.01	0.59
2012	22.42	0.59	10.04	0.59
2013	22.61	0.60	10.12	0.60
2014	22.69	0.60	10.16	0.60
2015	22.70	0.60	10.16	0.60
2006-2015 Average	**22.28**	0.59	**9.98**	0.59
Total Cash Costs ($1000)				
2006	14.96	0.39	10.93	0.64
2007	14.74	0.39	6.75	0.40
2008	14.55	0.38	10.75	0.63
2009	14.72	0.39	6.75	0.40
2010	14.94	0.39	10.93	0.64
2011	15.21	0.40	6.98	0.41
2012	15.45	0.41	11.18	0.66
2013	15.71	0.41	7.21	0.42
2014	16.00	0.42	11.43	0.67
2015	16.27	0.43	7.47	0.44
2006-2015 Average	**15.25**	0.40	**9.04**	0.53
Net Cash Farm Income ($1000)				
2006	7.14	0.19	-1.03	-0.06
2007	7.26	0.19	3.10	0.18
2008	7.43	0.20	-0.91	-0.05
2009	7.14	0.19	3.04	0.18
2010	7.16	0.19	-1.04	-0.06
2011	7.16	0.19	3.03	0.18
2012	6.97	0.18	-1.14	-0.07
2013	6.91	0.18	2.91	0.17
2014	6.70	0.18	-1.27	-0.07
2015	6.43	0.17	2.69	0.16
2006-2015 Average	**7.03**	0.19	**0.94**	0.06
Ending Cash Reserves ($1000)				
2006	7.14	0.19	-4.87	-0.29
2007	14.40	0.38	-1.77	-0.10
2008	21.83	0.57	-2.68	-0.16
2009	28.99	0.76	0.36	0.02
2010	36.18	0.95	-0.68	-0.04
2011	43.39	1.14	2.36	0.14
2012	50.43	1.33	1.22	0.07
2013	57.46	1.51	4.14	0.24
2014	64.31	1.69	2.87	0.17
2015	70.96	1.87	5.56	0.33
2006-2015 Average	**39.51**	1.04	**0.65**	0.04

Table 5. Cotton, Furrow & Drip Irrigation Demonstration

	Furrow (38 acres)	Drip (17 acres)
Prob. Net Cash Income < Zero (%)		
2006	1.00	70.00
2007	1.00	1.00
2008	1.00	70.00
2009	1.00	1.00
2010	1.00	73.00
2011	1.00	2.00
2012	1.00	76.00
2013	1.00	1.00
2014	1.00	78.00
2015	2.00	3.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**	**37.40**
Average Annual Operating Expense/Receipts		
2006	0.69	1.13
2007	0.69	0.70
2008	0.68	1.12
2009	0.69	0.71
2010	0.69	1.14
2011	0.70	0.72
2012	0.71	1.15
2013	0.71	0.73
2014	0.72	1.16
2015	0.74	0.75
2006-2015 Average	**0.70**	**0.93**

Figure 43-1. Projected Variability in Net Cash Farm Income for Furrow vs. Drip Irrrigated Cotton.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 44A: Cotton, Surge Irrigation with Poly-Pipe

The basic costs of production assumptions for the cotton surge with poly-pipe demonstration are given in Table 44A-1. For the purpose of presenting economic viability and outlook for the 38-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38 acres of surge irrigation with poly-pipe cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.529/lb., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a surge valve at a cost of $2,200. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the surge irrigation with poly-pipe is provided in Table 44A-2-A, followed by a cash flow summary (Table 44A-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 44A-3 and Figures 44A-1 and 44A-2. Table 44A-3 presents the average outcomes for selected financial projections,

while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $22,490 over the 10-year period and cash costs average just under $17,370. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. NCFI increases throughout the 10-year period from $2,870 in 2006 to $6,440 in 2015 (Table 44A-3). The risk associated with prices and yields suggests some chances of negative NCFI. In a normal production year, NCFI (Figure 44A-1) could range as much as $6,000 plus or minus the average expected NCFI for the site. Cash reserves are expected to grow throughout the 10-year projection period and reach $51,680 by 2015 (Table 44A-3). The average cash flow balances (Table 44A-3) are intended to illustrate the cash requirements or flows generated using the surge irrigation method. Figure 44A-2 depicts the growth in cash reserves, and the risk associated with the ending cash balance by reflecting the probability of carryover debt in the early years of the projection. The probability of carryover debt is 18% or greater in 2006 and then declines to 1% of less by 2011.

Table 44A-1. Cotton, Surge Irrigation with Poly-Pipe Demonstration
SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	SprCorn	Sorghm Irr	Cotton Irr	Cotton SdIrr
PLANTED ACRES	0	0	38	38
BASE ACRES	6.27	4.89	22.42	0
YIELD UNITS	bu	cwt	lb	ton
BUDGETING YIELD	83	45	750	0.63
FARM PROG YLD DIR	79	35.28	550	0
FARM PROG YLD CCP	79	35.28	550	0
PRICES/YIELD UNIT	2.46	3.62	0.45	106.62
VARIABLE PRODUCTION COSTS ($/ACRE)				
SEED	45	16	45	0
FERTILIZER	30	24	31	0
HERBICIDES	15	5	20	0
INSECTICIDES	0	0	0	0
FUNGICIDES	0	0	0	0
CUSTOM APPLICATION	0	0	30	0
SCOUTING / OTHER	0	0	0	0
IRRIGATION FUEL	42	18	40	0
TILLAGE/HARVST FUEL	0	0	21	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.152	0.27	0.12	0
HARVEST COST/ACRE	0	0	0	0
BOLL WEEVIL COST/ACRE	0	0	28	0
LABOR COST /ACRE	0	0	57	0
CROP INSURANCE				
YIELD ELECTION (FRACTION)	0.65	0.5	0.65	0
YIELD COVERAGE GUARANTEE	0	0	383.305	0
PRICE ELECTION (FRACTION)	1	1	1	0
PRICE GUARANTEE	0	0	0.5115	0
PREMIUM RATE ($/ACRE)	9.16	5.38	10.1	0
PREMIUM COSTS	0	0	383.8	0

Table 44A - 2 - A. Cotton, Surge with Poly-Pipe Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	15,377	16,401	17,349	17,683	17,991	18,618	18,937	19,291	19,621	19,973
DECOUPLED DIRECT PAYMENTS	909	909	909	909	909	909	909	909	909	909
DECOUPLED CCPs	1,581	1,409	1,245	1,123	1,071	1,068	1,031	988	982	978
MARKETING LOAN PAYMENTS	2,720	2,229	1,933	1,766	1,818	1,783	1,667	1,660	1,706	1,673
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**20,588**	**20,948**	**21,435**	**21,480**	**21,789**	**22,379**	**22,543**	**22,847**	**23,217**	**23,534**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	1,710	1,735	1,712	1,729	1,754	1,783	1,799	1,820	1,838	1,853
FERTILIZER COSTS	1,178	1,185	1,172	1,158	1,174	1,184	1,192	1,212	1,230	1,243
HERBICIDE COSTS	760	758	749	755	763	770	778	788	796	802
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
MAINTENANCE & EQUIPMENT	1,140	1,124	1,059	1,025	997	975	965	976	992	1,007
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,520	1,520	1,520	1,534	1,555	1,581	1,606	1,631	1,661	1,691
FUEL & LUBE COSTS	798	787	741	717	698	683	675	683	694	705
HARVESTING COSTS	3,420	3,428	3,283	3,228	3,191	3,174	3,191	3,282	3,389	3,496
CROP INSURANCE PREMIUMS	384	384	384	384	384	384	384	384	384	384
BOLL WEEVIL COSTS	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064
HIRED LABOR COSTS	2,166	2,232	2,304	2,368	2,426	2,489	2,553	2,613	2,675	2,737
SUB-TOTAL OF PROD COSTS	14,140	14,217	13,989	13,963	14,004	14,087	14,206	14,453	14,723	14,982
CASH RENT FOR CROPLAND	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Surge Valve	220	220	220	220	220	220	220	220	220	220
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	17,020	17,097	16,869	16,843	16,884	16,967	17,086	17,333	17,603	17,862
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	638	538	397	244	78	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**17,658**	**17,635**	**17,266**	**17,086**	**16,962**	**16,967**	**17,086**	**17,333**	**17,603**	**17,862**
NET CASH FARM INCOME	**2,930**	**3,312**	**4,170**	**4,394**	**4,827**	**5,411**	**5,457**	**5,514**	**5,613**	**5,672**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**2,930**	**3,312**	**4,170**	**4,394**	**4,827**	**5,411**	**5,457**	**5,514**	**5,613**	**5,672**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	542	551	564	565	573	589	593	601	611	619
CASH EXPENSES ($/ACRE)	465	464	454	450	446	447	450	456	463	470
NET CASH INCOME ($/ACRE)	77	87	110	116	127	142	144	145	148	149

Table 44A - 2 - B. Cotton, Surge Irrigation with Poly-Pipe Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**2,930**	**6,246**	**10,423**	**14,831**	**19,680**	**25,124**	**30,636**	**36,231**	**41,957**
PLUS:										
NET CASH FARM INCOME	2,930	3,312	4,170	4,394	4,827	5,411	5,457	5,514	5,613	5,672
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	4	7	15	21	34	55	81	112	149
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**2,930**	**6,246**	**10,423**	**14,831**	**19,680**	**25,124**	**30,636**	**36,231**	**41,957**	**47,778**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	2,930	6,246	10,423	14,831	19,680	25,124	30,636	36,231	41,957	47,778
ENDING YEAR CASH RESERVE	**2,930**	**6,246**	**10,423**	**14,831**	**19,680**	**25,124**	**30,636**	**36,231**	**41,957**	**47,778**

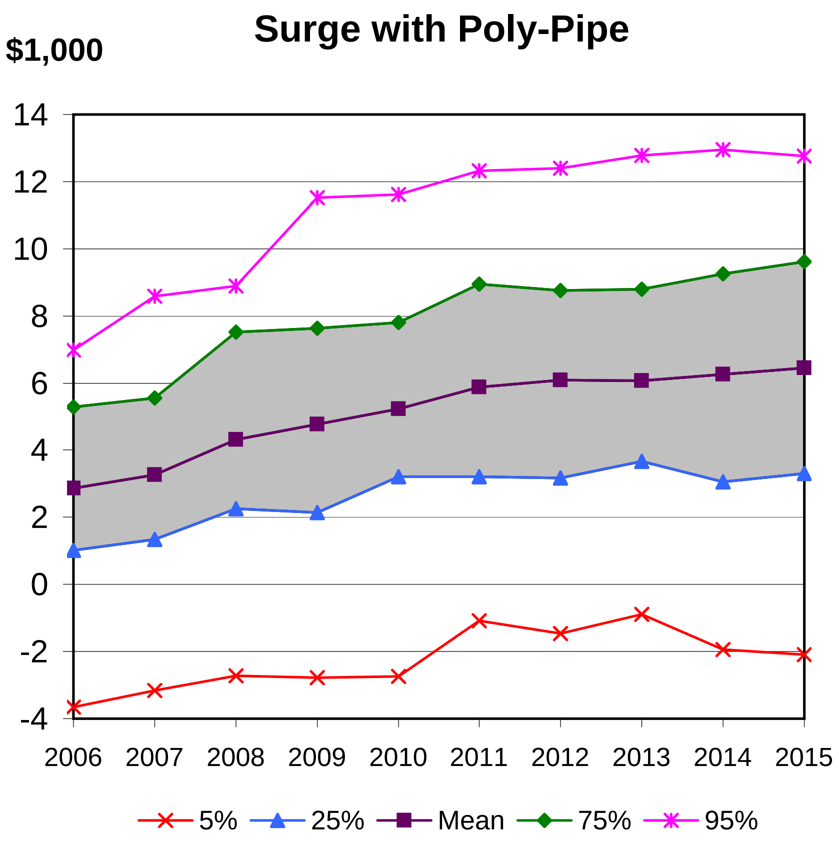
Table 44A-3. Cotton, Surge Irrigation with Poly-Pipe Demonstration

	Surge with Poly-Pipe
Total Cash Receipts ($1000)	
2006	20.51
2007	20.90
2008	21.57
2009	21.90
2010	22.25
2011	22.93
2012	23.23
2013	23.41
2014	23.86
2015	24.31
2006-2015 Average	**22.49**
Total Cash Costs ($1000)	
2006	17.64
2007	17.64
2008	17.27
2009	17.12
2010	17.04
2011	17.05
2012	17.15
2013	17.35
2014	17.61
2015	17.87
2006-2015 Average	**17.37**
Net Cash Farm Income ($1000)	
2006	2.87
2007	3.26
2008	4.31
2009	4.78
2010	5.22
2011	5.88
2012	6.08
2013	6.06
2014	6.26
2015	6.44
2006-2015 Average	**5.12**
Prob. Net Cash Income < Zero (%)	
2006	18.00
2007	18.00
2008	14.00
2009	11.00
2010	10.00
2011	9.00
2012	8.00
2013	8.00
2014	13.00
2015	10.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**11.90**

Table 44A-3. Cotton, Surge Irrigation with Poly-Pipe Demonstration

	Surge with poly-Pipe
Ending Cash Reserves ($1000)	
2006	2.87
2007	6.14
2008	10.45
2009	15.25
2010	20.49
2011	26.41
2012	32.55
2013	38.70
2014	45.08
2015	51.68
2006-2015 Average	**24.96**
Prob. of Ending Cash Reserves < Zero (%)	
2006	18.00
2007	10.00
2008	7.00
2009	4.00
2010	2.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**4.30**
Average Annual Operating Expense/Receipts	
2006	0.86
2007	0.85
2008	0.81
2009	0.80
2010	0.79
2011	0.77
2012	0.76
2013	0.77
2014	0.77
2015	0.77
2006-2015 Average	**0.79**

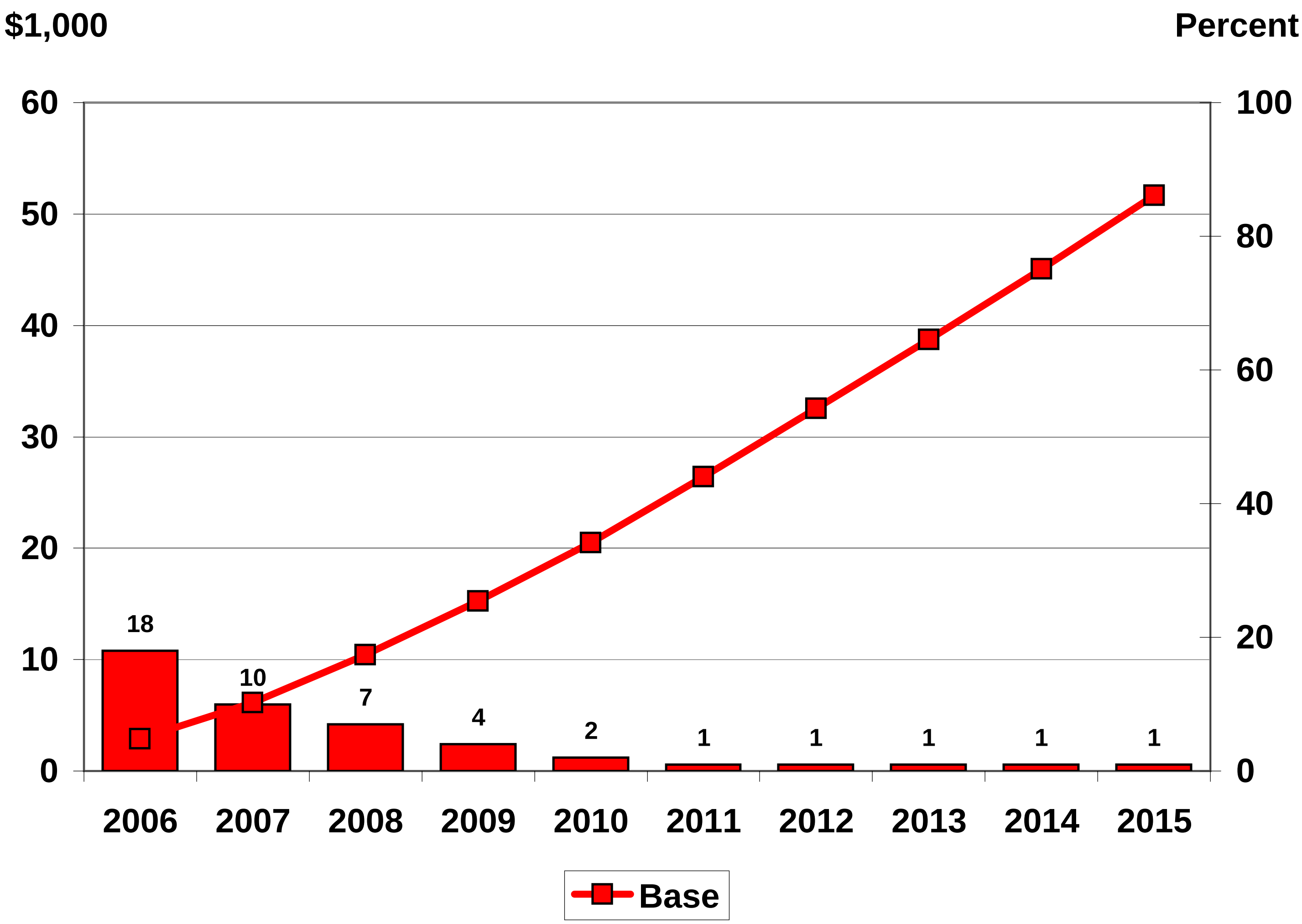
Figure 44A-1. Projected Variability in Net Cash Farm Income for Irrigated Cotton, Surge Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 44A-2. Ending Cash Reserves and Prob. of Having to Refinance Operating Note for Irrigated Cotton, Surge Irrigation with Poly-Pipe Demonstration.



FARM Assistance

Helping Agriculture Make Informed Decisions

Demonstration Site 45: Sugarcane, Furrow Irrigation with Poly-Pipe

Table 45-1 provides the basic cost of production assumptions for the sugarcane furrow irrigation with poly-pipe demonstration. For the purpose of presenting economic viability and outlook for the 38-acre site, production costs and overhead charges are producer estimated rates and may not be typical for the region. The actual demonstration was conducted on a new field of sugarcane, where 2006 is the establishment year of the crop and the first year of the financial projection. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38 acres of sugarcane production including the initial outright purchase of sugarcane grinding rights ($800/acre) with no financing. While the baseline scenario produces a negative cash position and subsequent negative carryover cash balances, no interest was charged on carryover balances. The purpose is to illustrate the amount of cash flow a producer would have to support. Some may support that cash flow with extended term debt, and others may be able to self finance the purchase with no direct interest cost. For the 10-year outlook projection, the sugarcane price is based on the producer's estimate of future prices and is held at an average of $17 per ton throughout the analysis period. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the baseline is provided in Table 45-2-A, followed by a cash flow summary (Table 45-2-B). The income and cash flow statement results from the simplistic (no risk) forecast assuming average prices and yields. The more comprehensive projection including price and yield risk is illustrated in Table 45-3 and Figures 45-1, 45-2 & 45-3. Table 45-3 presents the average outcomes for selected financial projections, while the graphical presentations illustrate the full range of possibilities for Net Cash Farm Income (NCFI) and cash flow requirements. Total cash receipts average just over $32,000 initially and decline as the productive capacity of the sugarcane diminishes until the sixth year when the land is idle. Cash costs also reflect the sugarcane production cycle, requiring roughly $21,080 in the initial year, about one-half that amount in subsequent years and approximately $4,930 in the idle year. Average NCFI generally follows the sugarcane production cycle producing $11,180 profit in the initial year and peaking at $17,310 the second year. It averages approximately $9,680 per year for the assumed 6-year sugarcane cycle. The risk associated with prices and yields suggests that, in a normal production year, NCFI (Figure 45-1) could range as much as $7,000 to $8,000 plus or minus the average expected NCFI. Except for the 2011 idle year, cash reserves are expected to grow throughout the 10-year projection period Figure 45-2. The average cash flow balances (line in Figures 45-2 and 45-3) are intended to illustrate the cash requirements or positive flows generated by the enterprise. The bars in Figure 45-3 indicate the probability of the net cash impact being negative in a specific year. It is important to note here that, although not included, the base could also create definitive interest charges depending on the whole farm's ability to support the cash requirements of the enterprise.

Table 45-1. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS.

	Sugar Cane
PLANTED ACRES	38
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	50
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	17
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	48
HERBICIDES	18
INSECTICIDES	0
FUNGICIDES	0
CUSTOM APPLICATION	0
SCOUTING / OTHER	0
IRRIGATION FUEL	56
TILLAGE/HARVST FUEL	16
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	33
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.65
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	16
PREMIUM RATE ($/ACRE)	13
PREMIUM COSTS	494

Table 45 - 2 - A. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstratioı

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	32,300	29,070	25,840	24,548	19,380	0	32,300	29,070	25,840	24,548
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**32,300**	**29,070**	**25,840**	**24,548**	**19,380**	**0**	**32,300**	**29,070**	**25,840**	**24,548**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	1,824	1,764	1,717	1,736	1,771	0	1,849	1,884	1,916	1,950
HERBICIDE COSTS	684	677	673	678	686	0	707	716	727	737
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	0	0	0	0	0	0	0	0	0	0
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION COSTS	2,128	2,066	2,012	2,031	2,058	0	2,126	2,159	2,199	2,239
FUEL & LUBE COSTS	608	590	575	580	588	0	607	617	628	640
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	494	494	494	494	494	0	494	494	494	494
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	1,254	1,287	1,322	1,355	1,390	0	1,466	1,506	1,548	1,593
SUB-TOTAL OF PROD COSTS	6,992	6,878	6,793	6,874	6,986	0	7,249	7,376	7,512	7,652
CASH RENT FOR CROPLAND	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LandPrep	1,520	0	0	0	0	0	1,748	0	0	0
Seed	3,002	0	0	0	0	0	3,452	0	0	0
Planting	4,750	0	0	0	0	0	5,463	0	0	0
Irr&Prop Tax	1,013	1,032	1,052	1,076	1,102	1,131	1,162	1,193	1,225	1,258
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	21,077	11,710	11,645	11,750	11,888	4,931	22,874	12,369	12,537	12,710
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	5	10	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	15	3	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**21,077**	**11,730**	**11,659**	**11,750**	**11,888**	**4,931**	**22,874**	**12,369**	**12,537**	**12,710**
NET CASH FARM INCOME	**11,223**	**17,340**	**14,181**	**12,798**	**7,492**	**-4,931**	**9,426**	**16,701**	**13,303**	**11,838**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**11,223**	**17,340**	**14,181**	**12,798**	**7,492**	**-4,931**	**9,426**	**16,701**	**13,303**	**11,838**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	850	765	680	646	510	0	850	765	680	646
CASH EXPENSES ($/ACRE)	555	309	307	309	313	130	602	326	330	334
NET CASH INCOME ($/ACRE)	295	456	373	337	197	-130	248	439	350	312

Table 45 - 2 - B. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**0**	**0**	**12,344**	**25,148**	**32,664**	**27,788**	**37,250**	**54,034**	**67,495**
PLUS:										
NET CASH FARM INCOME	11,223	17,340	14,181	12,798	7,492	-4,931	9,426	16,701	13,303	11,838
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	0	0	5	25	54	36	84	158	238
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**11,223**	**17,340**	**14,181**	**25,148**	**32,664**	**27,788**	**37,250**	**54,034**	**67,495**	**79,571**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	30,400	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	19,177	1,837	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**30,400**	**19,177**	**1,837**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	-19,177	-1,837	12,344	25,148	32,664	27,788	37,250	54,034	67,495	79,571
ENDING YEAR CASH RESERVE	**0**	**0**	**12,344**	**25,148**	**32,664**	**27,788**	**37,250**	**54,034**	**67,495**	**79,571**

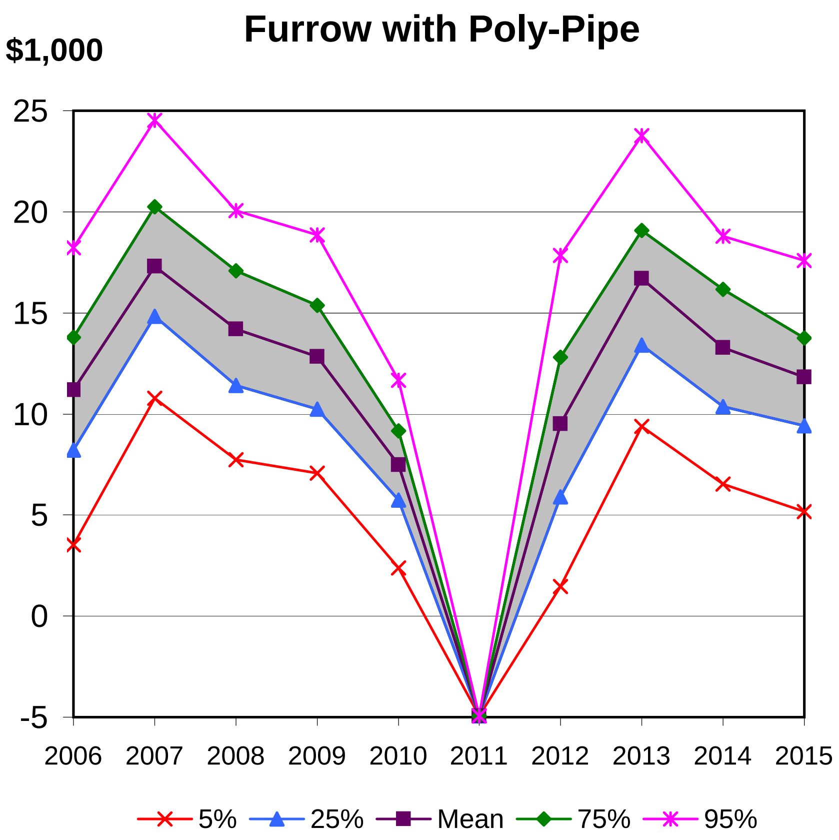
Table 45-3. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration

	Furrow with Poly-Pipe
Crop Receipts ($1000)	
2006	32.26
2007	29.04
2008	25.87
2009	24.59
2010	19.37
2011	0.00
2012	32.40
2013	29.06
2014	25.82
2015	24.54
2006-2015 Average	**24.29**
Total Cash Receipts ($1000)	
2006	32.26
2007	29.04
2008	25.87
2009	24.59
2010	19.37
2011	0.00
2012	32.40
2013	29.06
2014	25.82
2015	24.54
2006-2015 Average	**24.29**
Total Cash Costs ($1000)	
2006	21.08
2007	11.73
2008	11.66
2009	11.75
2010	11.89
2011	4.93
2012	22.88
2013	12.37
2014	12.54
2015	12.71
2006-2015 Average	**13.35**
Average Annual Operating Expense/Receipts	
2006	0.67
2007	0.41
2008	0.46
2009	0.49
2010	0.63
2011	0.00
2012	0.72
2013	0.44
2014	0.50
2015	0.53
2006-2015 Average	**0.48**
Net Cash Farm Income ($1000)	
2006	11.18
2007	17.31
2008	14.21
2009	12.84
2010	7.48
2011	-4.93
2012	9.52
2013	16.69
2014	13.28
2015	11.83
2006-2015 Average	**10.94**

Table 45-3. Sugarcane, Furrow with Poly-Pipe Demonstration

	Furrow with Poly-Pipe
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	99.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**10.10**
Ending Cash Reserves ($1000)	
2006	-19.22
2007	-1.91
2008	12.30
2009	25.14
2010	32.65
2011	27.77
2012	37.33
2013	54.10
2014	67.54
2015	79.61
2006-2015 Average	**31.53**

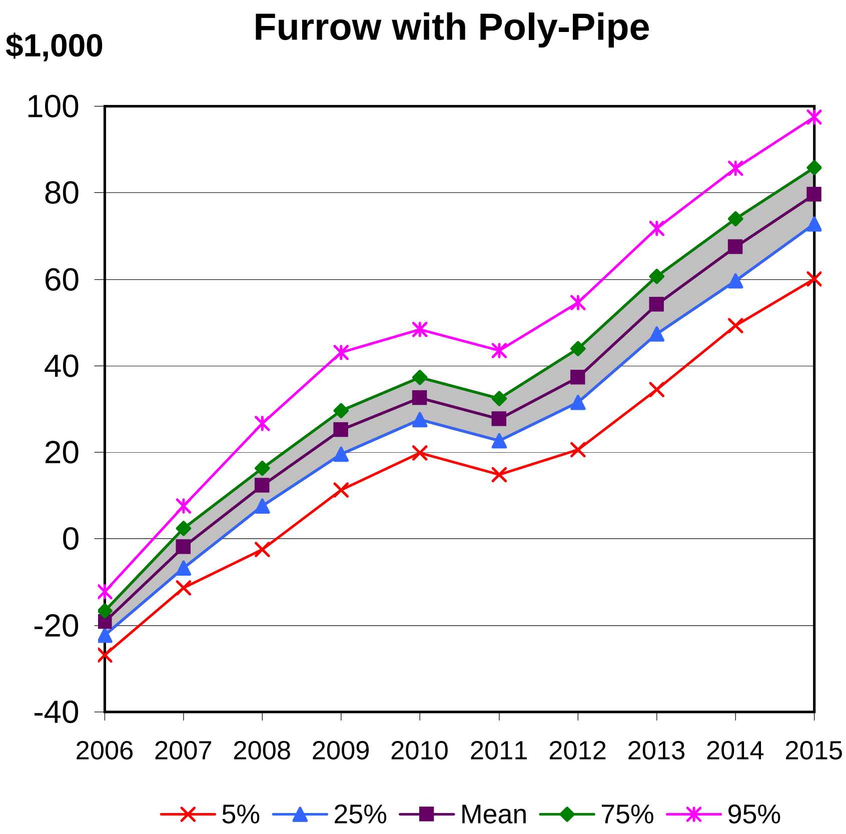
Figure 45-1. Projected Variability in Net Cash Farm Income for Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

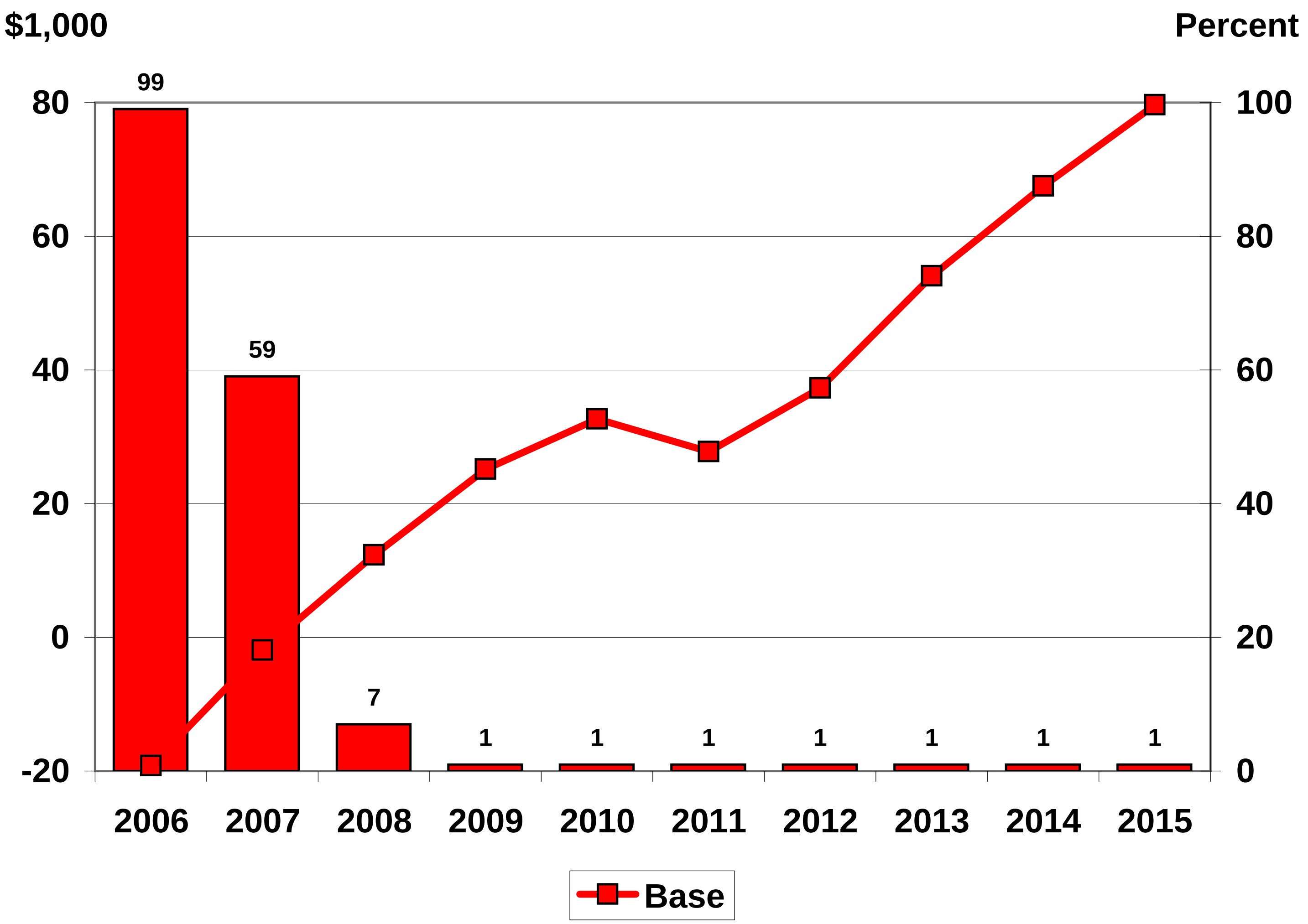
Figure 45-2. Projected Variability in Ending Cash Reserves for Sugarcane, Furrow with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 45-3. Ending Cash Reserves and Probability Cash Shortfall for Sugarcane, Furrow with Poly-Pipe Demonstration.



FARM Assistance

Helping Agriculture Make Informed Decisions

On-Farm Drip and Furrow Flood Irrigation in Annual and Multi-Year Crops

ADI

Annual Report

2006

Submitted by
Texas A&M University-Kingsville, Citrus Center

Dr. Shad Nelson,
Heriberto Esquivel

and

Texas A&M Extension Service, Weslaco, TX
Dr. Juan Enciso

Table of Contents

Drip and Furrow Flood Irrigation in Annual and Multi Year Crops

Texas A&M University-Kingsville and Texas A&M Extension Service have teamed together to establish various water conservation demonstration sites throughout the Lower Rio Grande Valley (LRGV). The project managers (Dr. Shad Nelson, TAMU-Kingsville and Dr. Juan Enciso, TAES, Weslaco) have made contact with 12 growers/collaborators in the Valley to monitor on farm irrigation at different demonstration sites. These sites encompass a variety of crops including, but not limited to young and mature citrus (grapefruit, orange and tangerine), onions, celery, tomato, corn, cotton and sorghum. Irrigation practices to grow these crops are flood, polypipe furrow/flood, drip, and microjet spray.

Current aim this past year has been to establish contact with collaborators/growers in the LRGV willing to work with us to monitor water use and crop production over a long period of time. This work was initiated in late spring to early summer 2005 where initial cooperation was challenging among growers in the Valley. After several months of developing relationships of trust with Valley growers that informal discussion resulted in more firm collaborative commitments. By the end of 2006 we had 14 committed growers as willing participants to collaborate with us in on farm water conservation demonstration sites. Many of these sites have more than one cropping system for monitoring.

Our initial goals for demonstration sites is not to redirect the water management practices of the growers, so that we can establish a "baseline" data base that represent water use in the Valley. The baseline data will be used to evaluate water consumption per cropping system and irrigation method. It is projected that this collection of baseline data will continue through Project Year 2 (2006). To assist in monitoring water use and crop water consumption each site has been (or is in process of being) equipped with soil moisture sensors with real-time automatic data logging units. On-site rain gauges are also (or will be) supplied and attached to data logging equipment for determination of annual rainfall and for verification of when irrigation events occurred versus rain events. This data will be collected and monitored in tandem with water metering equipment. Water meters are (or will be) supplied at each location to keep track of the quantity of water applied during an irrigation event and over the growing season to each cropping site. The collection of this data is in its initial stages and not a lot of concrete information has been gathered over the past year as the main priority has been to establish new sites and commitments with collaborators.

Current Collaborators

The following is a list of current collaborators, the types of crops monitored during the fall 2005 and spring 2006 period. The list also covers the type of soil moisture sensing equipment and rain gauge systems in place. Depths of 6", 12', and 24", soil moisture sensors will be placed within the soil profile or bed. Current collaborators under the direction of Dr. S. Nelson (and PhD candidate Ram Uckoo and Eddie Esquivel- Project Coordinator) and Dr. J. Enciso (and science technician Xavier Peries) are listed below.

Field Sites under direction of Dr. Nelson & Eddie Esquivel:

ID ref #01 **5 cropping sites**
-1a for block ref. Rio Red (narrow borders), 73 acres
-1b for block ref. Rio Red (narrow borders), 85 acres
-1c for block ref. Valencia (flood); 15 acres
-1d for block ref. Onion 2005 White/Red var. (Drip), 12 acres
-1e for block ref. Onion 2005 Yellow var. (Drip), 52 acres
Installed: 2 ECHO probe locations; one rain gauge
ID ref #02 **3 cropping sites**
- 2a for block ref. Rio Red (microjet), Henderson grapefruit (narrow borders), 14 acres
- 2b for block ref. Rio Red (narrow borders), 5 acres
- 2c for block ref. Ruby Red (drip), 4 acres (not working at this time)

Installed: 2 ECHO probe locations; one rain gauge, need to install one location with Goal: WatchDog data logger and Watermark sensors. Install new 10" water meter with 2, 2" meters on microjet and drip locations.
ID ref #03 **1 cropping sites**
- 3a for block ref. Rio Red grapefruit, Blood Navel orange, Tangerine (all flood)

Installed: ECHO probe in Rio Reds; rain gauge
ID ref #04 **2 cropping sites**
- 4a for block ref. Rio Red (Drip), Marrs orange, Pineapple orange, Tangerine, 86 acres
- 4b for block ref. Rio Red (Micro-jet), Marrs orange, 30 acres

Installed: 2 ECHO probe locations; one WatchDog datalogger w/ Watermark sensor; one rain gauge
ID ref #5 **1 cropping sites**
- 5a for block ref. White Onions (Drip Irrigation)

Installed: 1 ECHO probe locations; one WatchDog Rain Logger; one rain gauge
ID ref #06 **2 cropping sites**
- 6a for block ref. Rio Red Grapefruit (Drip/Microjet Irrigation)
- 6b for block ref. Rio Red Grapefruit (Traditional Flood)

Installed: 1 ECHO probe locations; one WatchDog Rain Logger; one rain gauge

Field Sites under direction of Dr. Juan Enciso and Xavier Peires:

ID ref #21 **2 cropping sites**
-21a for block ref. (2006 Cotton), 3.5 acres
-21b for block ref. Grain Tank (2006 Cotton)**,** 100 acres
ID ref #22 **1 cropping sites**
-22a for block ref. Honeydews Spring 2006, 3 acres
ID ref #23 **1 cropping sites**
-23a for block ref. Oranges MJ (2005-2006-2007), 13.4 acres
ID ref #24
-24a for block ref. (2005-2006-2007), 7 acres **1 cropping sites**
ID ref #25
-24a for block ref. (Onion 2005-2006), 56 acres **1 cropping sites**
ID ref #26
-26a for block ref. (onion 2005-2006), 15.7 acres **1 cropping sites**
ID ref #27 **1 cropping sites**
-27a for block ref. Irrigation Scheduling SDI Onions 2005-2006, 0.65 acres
ID ref #28 **4 cropping sites**
-28a for block ref. 68 (MJ Oranges), 8 acres
-28b for block ref. 73 (Drip Grapefruits), 16 acres
-28c for block ref. 74 (MJ Grapefruits), 8 acres
-28d for block ref. 76 (Drip Oranges), 7 acres
ID ref #29 **1 cropping sites**
-29a for block ref. Low Pressure irrigation SDI - Cotton 2005-2006, 2.6 acres

Project Plans for the Demonstration Sites for Mar 2006-Feb 2007

1. All sites require metering devices. This project year will focus on accurate metering of water. Improvement in how metering data is collected will be discussed with the collaborators listed below. Many growers have this equipment, but improvement in data collection and accuracy is needed.

2. All sites require rain gauge metering devices. This year will focus on installing automatic rain collection at each site.

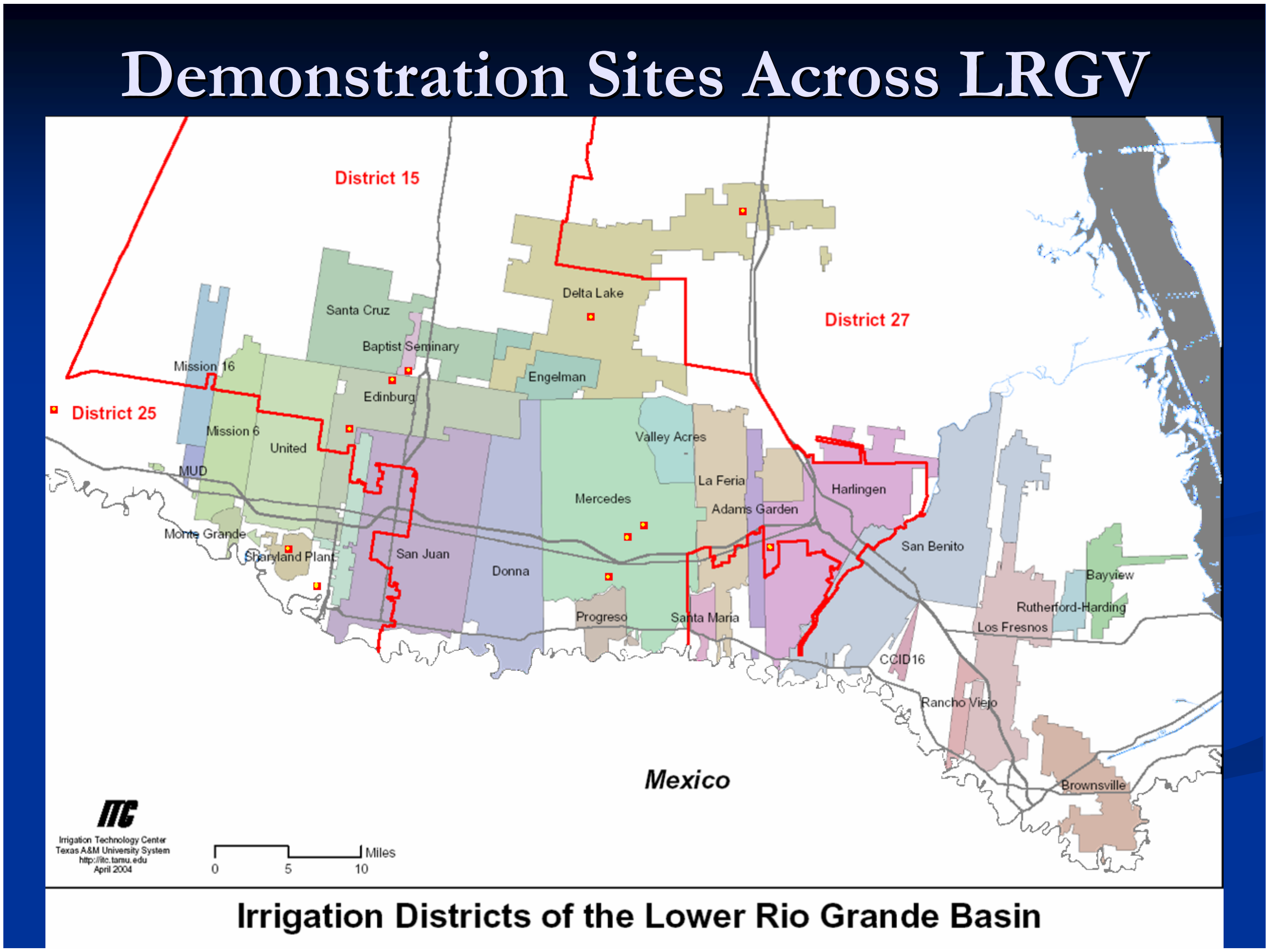
3. Soil moisture sensing devices will collect data for the purpose of evaluating to what depth irrigation water is moving within different cropping systems and soil types. These soil moisture sensors will also serve as a means of determining when irrigation events occurred and will be used to validate or check against rainfall and water metering data.

4. Total irrigation and rainfall distribution will be used at the end of the growing season and compiled with harvest data to determine water use efficiency (WUE) and irrigation use efficiency (IUE) for citrus and annual crops in the Valley.

5. An objective is to compile the data in a GIS program where this data can be displayed for specific locations in the Valley where the demonstration projects are located.

Reporting: A total of two quarterly formal reports were turned into the Harlingen Irrigation District (HID) in August and November 2006 detailing work accomplishments. One informal quarterly report summary was provided to HID.

Demonstration Sites



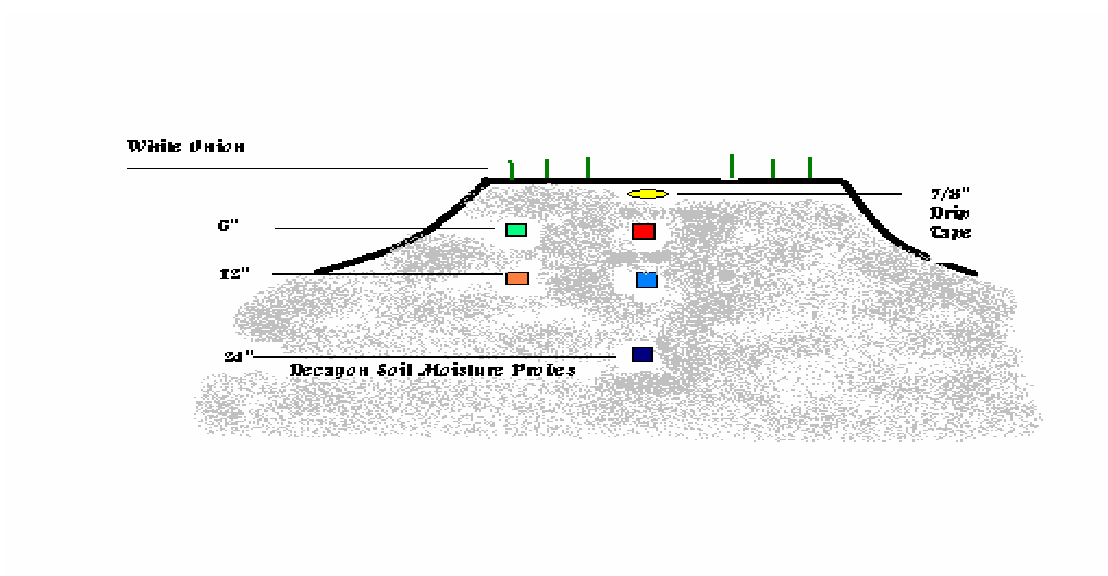
Above: Red dots indicate current collaborators throughout the Lower Rio Grande Valley.

Soil Moisture Determination

Decagon ECH$_2$O® probesEC-10 and EM-50 are installed two weeks after initial planting on ADI collaborator #5 from Willacy County.

Above: Decagon data loggers support 5 sensor placement locations (right) and installed in drip irrigated onion bed at ADI collaborator # 5’s farm (left).

Below: Fall onions planted in October 2006, raised beds with 7/8”diameter, single drip tape located bed center 2” below surface. Soil moisture sensors placed bed center (6”, 12”, and 24” depths) and edge of bed (6” and 12” depths) (below).



Below: Pictorial time-line of onion growth under drip irrigation with Collaborator #5 in Willacy County near Raymondville. White onions planted October 1, 2006 on drip irrigation on a 60" bed, 6 rows, with a center single drip line two inches underground.

Collaborator #5, Willacy County
November 3, 2006

Collaborator #5, Willacy County
November 30, 2006

Collaborator #5, Willacy County
January 10, 2007

Collaborator #2 with Three Cropping Sites

This particular site has drip, microjet and narrow bordered flood irrigation in close proximity. Agreements to install metering devices should be completed by late March 2007.

Mr. Danny Allen with Harlingen Irrigation District surveys connection line for a 10" metering device. (**above**) Neta-fim sprinkler and raised bordered flood both on Rio Red grapefruit fields. (**below**)

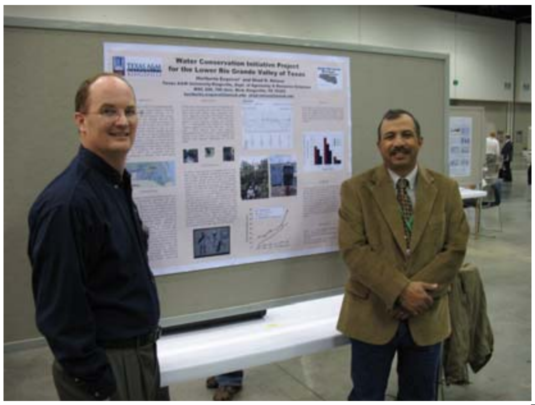
New signs are installed at different sites to signify cooperation with ADI program in LRGV. (**above**)

WatchDog and WaterMark sensor installation next to Decagon ECH_20 equipment on Collaborator #01's farm. (below)

Above: ADI collaborator #01 has mature Rio Red grapefruit and Valencia oranges on this plot. WatchDog data logger was installed to help facilitate soil moisture readings for farmer.

ASA-CSSA-SSSA 2006 International Annual Meeting, Indianapolis, Indiana

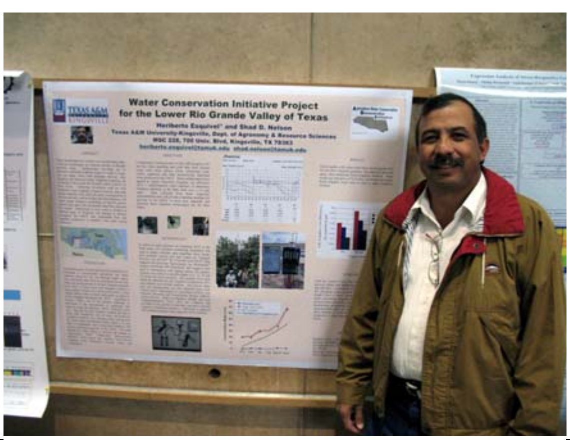
As members of the American Society of Agronomy/ Crop Science Society of America/ and Soil Science Society of America, Dr. Shad Nelson and Heriberto (Eddie) Esquivel presented a poster on Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas.

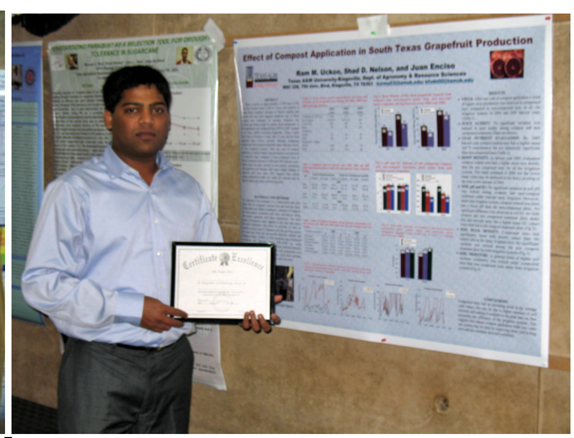


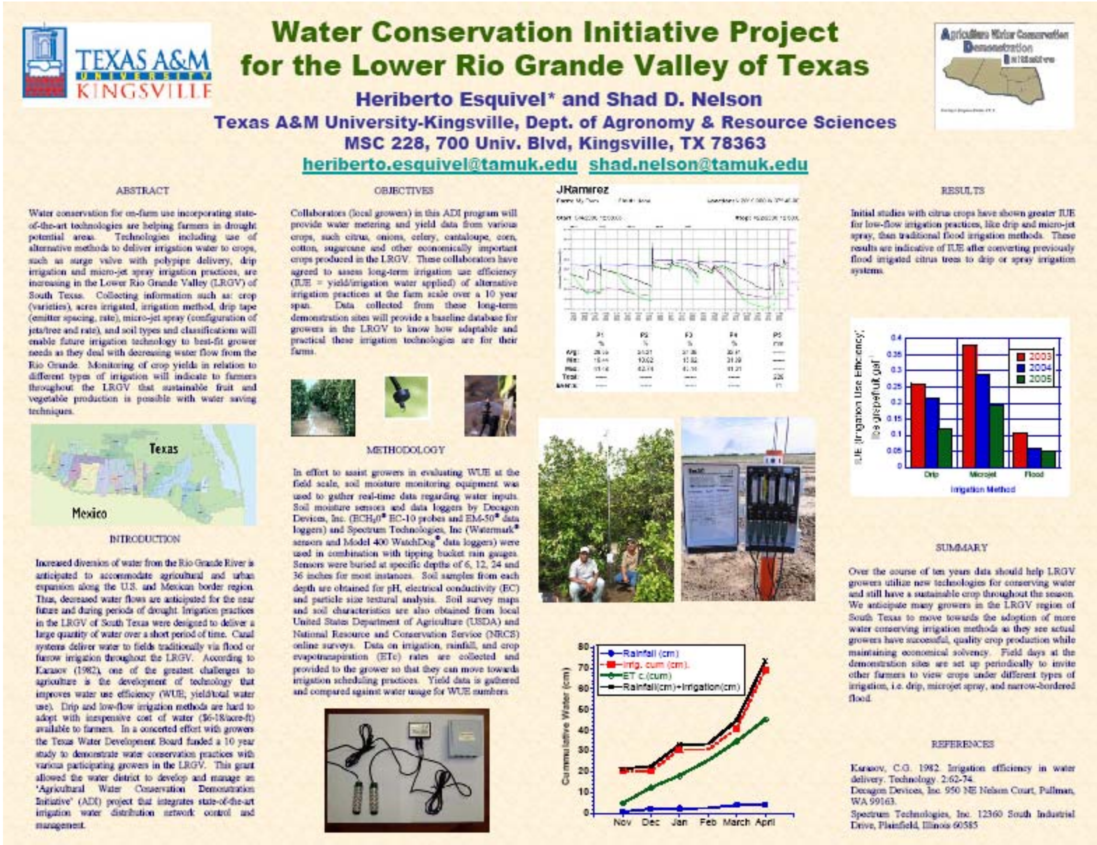
Above: Authors, Dr. Shad Nelson and H. Esquivel pose proudly next to poster in Indianapolis.

2007 61st Annual Rio Grande Valley Horticultural Society Meeting, Edinburg, TX.

Below: H. Esquivel presents his poster, *Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas* and Rammohon Uckoo stands by his 1st place poster titled- *Effect of Compost Application in South Texas Grapefruit Production*. Ram is currently at Texas A&M University at College Station working on his Ph.D.

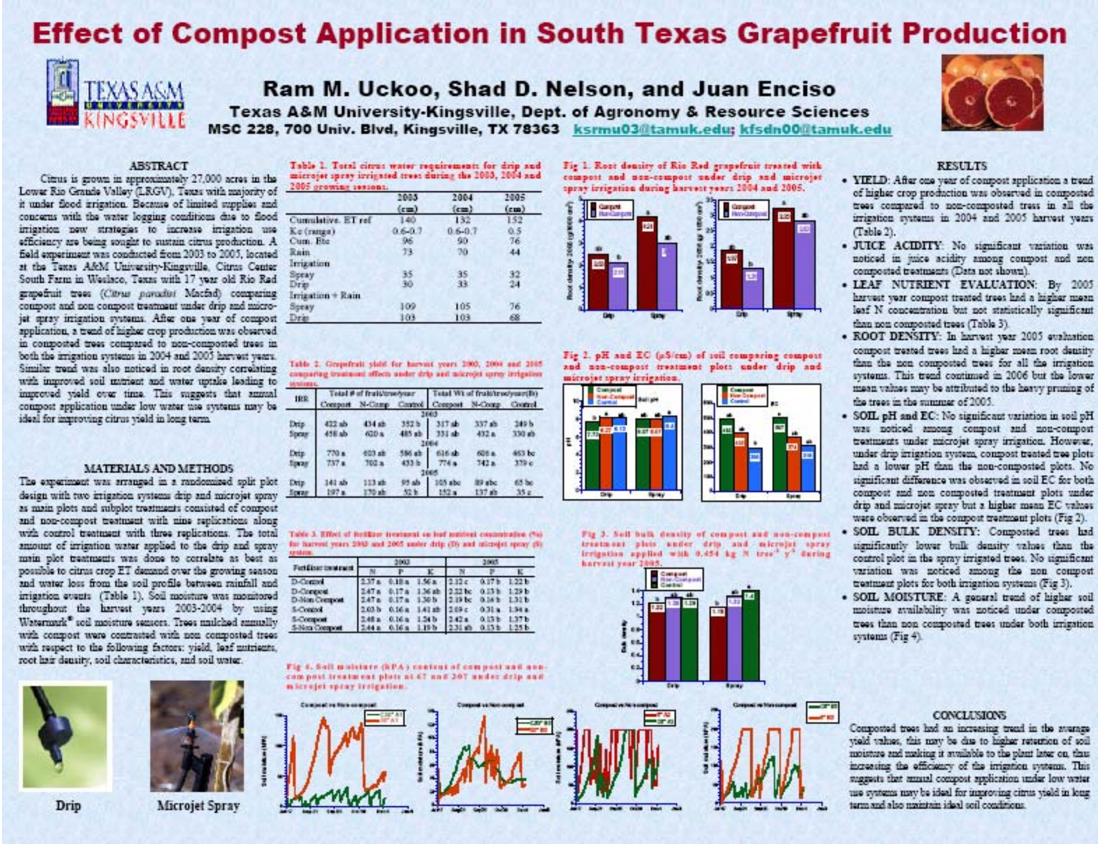






Above: H. Esquivel's ADI poster, presented at Indianapolis, Ind. and Edinburg, TX.

Below: R. Uckoo's 1st Place poster at Rio Grande Valley Horticultural Society Meeting at Edinburg, TX.



Rainfall Totals for Ends of Lower Rio Grande Valley 2005-2006

Average annual rainfall within the LRGV is approximately 25 inches. This past 2005 year the Valley experience below average rainfall. Below is an example of rainfall for two ends of the LRGV.

Monthly Rain Totals for McAllen

	Totals 2006 inch	Totals 2006 cumulative		Totals 2005 inch	Totals 2005 cumulative
Jan	0.08	0.08	Jan	1.02	1.02
Feb	0.13	0.21	Feb	0.96	1.98
Mar	0.55	0.76	Mar	0.4	2.38
April	0.01	0.77	April	0.02	2.4
May	0.73	1.5	May	1.78	4.18
June	0.35	1.85	June	0.5	4.68
July	3.4	5.25	July	7.37	12.05
Aug	0.76	6.01	Aug	1.85	13.9
Sept	11.22	17.23	Sept	1.08	14.98
Oct	1.73	18.96	Oct	1.34	16.32
Nov	0.1	19.06	Nov	0.4	16.72
Dec	2.73	21.79	Dec	0.48	17.2
	21.79	Total 2006 year		17.2	Total 2005 year

Monthly Rain Totals for Harlingen

	Totals 2005			Totals 2006	
	inch	cumulative		inch	cumulative
Jan	0.34	0.34	Jan	0.24	0.24
Feb	1.07	1.41	Feb	0.06	0.3
Mar	0.21	1.62	Mar	2.03	2.33
April	0.18	1.8	April	0.04	2.37
May	1.75	3.55	May	3.16	5.53
June	0.14	3.69	June	0.46	5.99
July	4.08	7.77	July	2.41	8.4
Aug	0.32	8.09	Aug	2.04	10.44
Sept	2.77	10.86	Sept	4.88	15.32
Oct	2.37	13.23	Oct	3.88	19.2
Nov	1.47	14.7	Nov	0.34	19.54
Dec	0.92	15.62	Dec	3.22	22.76
	15.62	Total 2005 year		22.76	Total 2006 year

This year we used on-site information of 2005-2006 harvest years (chart below), with two of the collaborator sites; site #01a (narrow bordered flood w/ polypipe) and site #28c (microjet). These two demonstration sites are relatively close (approximately 20 miles) to each other, rainfall amounts and soil properties are also similar.

IUE (irrigation use efficiency) and WUE (water use efficiency) numbers using pounds per acre inch, per tree comparing narrow bordered flood verses microjet irrigation, indicated better efficiencies with microjet irrigation. Total irrigation and rain in gallons per acre were significantly lower with microjet irrigation.

Due to scheduling differences between annual reports and citrus harvest events, for 2007 have not been received for this annual report.

Citrus Harvest Years 2005-2006: Rio Red Grapefruit

Assuming 27,000 citrus acres in LRGV under Microjet

Saved: Microjet vs Flood	Total Acreage LRGV	
gallons/ac	gallons	ac/ft
6.38E+05	1.72E+10	5.29E+04

Collaborator: #01
Block #106-107, Rio Red Grapefruit
73 acres, Narrow Bordered Flood (Polypipe)

IUE (yield/irr)	WUE (yield/(irr+rain))	IUE (yield/tree)	WUE (yield/tree(irr+rain))	Total Irr+Rain
[lbs/ac.in]	[lbs/ac.in]	[lbs/in-tree]	[lbs/in-tree]	[gallons/acre]
152820.45	72668.08	18.20	8.66	9.150E+05

Collaborator: #28
Block #74, Rio Red Grapefruit
8 acres, Microjet irrigation

IUE (yield/irr)	WUE (yield/(irr+rain))	IUE (yield/tree)	WUE (yield/tree(irr+rain))	Total Irr+Rain
[lbs/ac.in]	[lbs/ac.in]	[lbs/in-tree]	[lbs/in-tree]	[gallons/acre]
1882.72	972.89	16.23	8.39	2.770E+05

ADI Collaborator #21 Cotton Harvest 2006, Stress Irrigation vs. Conventional Irrigation

Difference: Stress vs. Conventional Irrigation	Acreage	Irrig-Total (Gal/acre)	Yield-Total (lbs/ac)	Irrig-Total ac. In./ac	IUE (yield/irr) [lbs/ac.in]	WUE (yield/(irr+rain)) [lbs/ac.in]	
317,332	3	977,553	571.00	126	31.72	19.16	Stress Irrig.
Gallons of water saved per acre	183.1	59,663,318	820.00	219,728	37.27	24.6	Conv. Irrig.

Above: On sandy loam soil, two sites, 3.5 acres (stress irrigation) and 100 acres (conventional irrigation) was studied during 2006. Both sites were planted in February and harvested in July of 2006 at 52,000 plants per acre on 40 inch beds. Furrow irrigation with polypipe was utilized on both sites. Irrigation Use Efficiency (IUE) and Water Use Efficiency (WUE) numbers were lower on the stress irrigated plots although the total yield was 30% higher with conventional irrigation water amounts.

Below: Information on Musk Melon, var. Honey Brews, in Hidalgo County. No comparison values available at this time.

	Collaborator #22, Hildalgo County, Musk Melon (Honey Brews)					
Acreage	Acre Foot per Acre	Irrig-Total (Gal/Acre)	Irrig-Total (ac.in/ac)	Yield-Total (lbs./ac)	IUE (yield/irr) (lbs/ac.in)	WUE (yd/(irr+rain)) (lbs/ac.in)
3	0.83	269,293	269,262	39,000	3,933	3,477

Planting and soil characteristics below on Musk Melon crop above:

Crop Characteristics	Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrigation Type
		Watermark sensors			
Planted on 02/13/06	Sand %	37.76	36.76	31.76	Sub-surface Drip
Harvested from	Silt %	45.72	48.72	53.72	
05/10 to 05/30/06	Clay %	16.52	14.52	14.52	
80-inch beds	Soil Type	Loam	Loam	Silt Loam	
	LaGloria S. Lm. (90%) & Rio Grande S. Lm. (10%)				
	BD (g/cm3)	1.10	1.33	1.18	
	FC	28.4	27.0	28.8	
	PWP	12.1	11.0	11.0	
	PAW (FC-PWP)	16.3	16.0	17.8	

Onion Sites of the Lower Rio Grande Valley

Acreage	Acre Foot per Acre	Irrig-Total (Gal)	Irrig-Total (ac.in/ac)	Yield-Total (lbs./ac)	IUE (yield/irr) (lbs/ac.in)	WUE (yd/(irr+rain)) (lbs/ac.in)
Collaborator #25, Starr County, Yellow Onions						
56	1.98	36,081,481	23.73	37,000	1559.29	1239.58
Collaborator #26, Hidalgo County, Yellow Onions						
15.7	1.26	6,464,884	15.60	48,336	3187.35	2900.46
Collaborator #1, Hidalgo County, Yellow Onions						
52	1.12	18,937,743	13.41	32,000	2385.96	1099.21

Information for Collaborator #25:

Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrig Type/ Information
	Watermark sensors			
Sand %	17.12	17.12	12.40	Sub-surface Drip
Silt %	42.72	42.72	45.44	Planted on 10/11/05
Clay %	40.16	40.16	42.16	Harvested on 04/15/06
Soil Type	Silty Clay	Silty Clay	Silty Clay	80-inch beds
LaGloria S. Lm. (78%), Rio Grande S. Lm. (17%) & Camargo Silty C. Lm. (5%)				
BD (g/cm3)	1.01	1.25	1.46	
FC	38.9	38.9	39.9	
PWP	24.3	24.3	25.2	
PAW (FC-PWP)	14.6	14.6	14.7	

Information for Collaborator #26:

Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrig Type/ Information
Watermark sensors				
Sand %	61.12	61.12	56.40	Sub-surface Drip
Silt %	22.72	20.72	19.44	
Clay %	16.16	18.16	24.16	
Soil Type	Sandy Lm.	Sandy Lm.	Sandy C. Lm.	
Brennan Fine Sandy Lm. (85%), Rio C. Lm. (12%) & Hidalgo Sandy C. Lm. (3%)				
BD (g/cm3)	1.39	1.53	1.66	
FC	21.8	22.8	26.9	Planted on 10/13/05
PWP	11.5	12.6	16.0	Harvested on 03/21/06
PAW (FC-PWP)	10.3	10.2	10.9	40-inch beds

Information for Collaborator #01:

Soil Characteristics	6" sensor	12" sensor	24" sensor	36" sensor	Irrig Type/Information
pH	7.7	7.6	7.7	7.8	Drip
EC (dS/m)	1.02	1.24	5.17	4.58	80 inch center-to-center beds
Sand %	33.12	35.12	47.12	34.24	1 drip tape/bed
Silt %	38	36	33.28	41.6	tape buried 6 to 8 inches
Clay %	28.88	28.88	19.6	24.16	18 inch emitter spacing
Soil Type (PSA)	Clay loam	Clay loam	Loam	Loam	0.4 gal/hr rate
BD (g/cm3)	n/a	n/a	n/a	n/a	6 rows onions / bed
FC	36	36	27	27	
PWP	23	23	13.4	13.4	
PAW (FC-PWP)	13	13	13.6	13.6	

ADI exposure to media and other external groups (not using ADI funds):

- Dr. Shad Nelson was interviewed on Channel 6- Morning Show, of Corpus Christi, TX on the goals and importance of water saving techniques used in irrigation of the Rio Grande Valley.
- Traveled to Indianapolis, Indiana on November 12, to present poster on Agricultural Demonstration Initiative project at the International ASA-CSSA-SSSA Annual Conference.
- Eddie Esquivel presented ADI poster (non-competition) at the University of Texas at Pan-Am in Edinburg, TX for the 61st Annual Rio Grande Valley Horticultural Society meeting. Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas.
- Rammohon Uckoo, Ph.D. candidate, TAMU, won first place in poster competition with his poster on Effect of Compost Application in South Texas Grapefruit Production. The 61st Annual Rio Grande Valley Horticultural Society meeting.
- Uckoo, R.M., S.D. Nelson, K.J. Shantidas, and J.M. Enciso. 2005 (published Oct 2006). Irrigation and fertilizer efficiency in South Texas grapefruit production. Subtropical Plant Science. Journal of the Rio Grande Valley Horticultural Society. 57:23-28. This is a publication originating from a water conservation project located at South Farm in Weslaco, TX comparing flood, drip and microjet spray on Rio Red grapefruit.

Summary of Hours Work on ADI projects in Year 2 by TAMUK employees

Year # 2 **2006**	**Personnel—Work Load in Year 2** **Feb. 15, 2006 to Jan. 31, 2007**	**Total Hrs Work**	**Total Hrs Paid**	**Extra Hrs Not Paid in Year 2**
2006 Year 2	**Shad Nelson**-Paid for 1 month summer salary during Year 2 (170 hr unpaid from Year 1 carried over)	**606**	**170**	**436**
2006 Year 2	**Heriberto Esquivel**-Research Associate (Paid Jun 1, 06 thru Jan 31, 07) Paid 8 months (34 wks) salary (40 hrs/wk) = 1360 hrs	**1543**	**1360**	**183**
2006 Year 2	**Ram Uckoo**-Part-time graduate student (Paid Feb 15-Aug 11, 06) Paid 6 months salary (20 hrs/wk)	**477**	**477**	**0**

Budgetary Expenditures during Years 1 & 2 of ADI project for TAMUK

TAMUK Sub-contract Budget	Year 1 2/15/05-2/14/06	Amendment # 1 2005	Year 1 2/15/05-2/14/06	Amendment # 2 2/15/06	Years 1&2 2/15/05-5/31/07	Years 1&2 2/15/05-5/31/07
	Total Original Amount	Total Amount Decrease	Total Adjusted Amount	Total Amount Increase	Total Adjusted Amount	Total Amount Spent
Salary & Fringe	51,214.00	0	51,214.00	52,547.00	103,761.00	90,398.50
Travel	6,000.00	0	6,000.00	0	6,000.00	6000.00
Operational Supplies	22,750.00	-10,007.00	12,743.00	0	12,743.00	11,672.14
Total	79,964.00		69,957		122,504.00	102,070.64

Additional Matching Funds brought to ADI Projects during Year 2

Other grant funds:

1. **$16,500.** Rio Grande Basin Initiative, Task 4: "On-Farm Irrigation System Management". Money pays for 1 demonstration site and labor associated with this demonstration site located in Weslaco, TX.

Other donated sources:

1. **Salaries** for Xavier Périès, Juan Ramirez and Dr. Juan Enciso at Texas Agricultural Experiment Station, Weslaco, TX. These people are currently collecting data for this project without monetary reimbursement. Dollar amount unknown, but substantial.
   Dr. Kim Jones and Irama Wesselman from the Dept. of Environmental Engineering at TAMUK contributed their paid time to consult and analyze soil moisture data.

2. **$5,340.** Mileage for Department of Agronomy & Resource Science truck donated and paid by departmental annual budget. With approximately 30 trips to the Lower Rio Grande Valley per year and approximately 400 miles per trip visiting ADI collaborators, this equates to approximately 12,0,000 miles driven during project Year 2 from Feb 2006 to Feb 2007. At 44.5 cents/mile this equals $5,340.00 in gas and maintenance associated with the truck that is not assessed against the ADI budget.

Current Assessment Questions for ADI projects under TAMUK

1. ***How is the data being collected and how is it being stored?***

Data from soil moisture sensing equipment and rain gauges at the afore-mentioned sites are being handled by Dr. Nelson's group (Ram Uckoo, Eddie Esquivel) and Dr. Enciso's staff (Xavier Peires) working on this project: and. Dr. Nelson's group handles 6 locations, while Dr. Enciso's group handles 8 locations. The data is collected in the field, stored temporarily on a laptop computer or Personal Digital Assistant (PDA), and then transferred to another computer at the research station/lab in Kingsville or Weslaco.

2. ***How will the data be made available to other growers?***

Data downloaded will be delivered to Harlingen Irrigation District and Tom McLemore to make the data available on the hidcc1.org website, where soil moisture monitoring and rainfall data will be collected for growers to see.

ADI Collaborators will provide us with harvest, fertility, and input data respective to their ADI demonstration site. This information will be made available on the hidcc1.org website.

3. ***What are the ultimate goals of data collection?***

We anticipate correlating water use from various irrigation systems with current irrigation practices used by growers. Initially soil moisture monitoring with evaluate where and to what depth water is moving within the soil profile. Also, correlate ET demand and crop water use (where in the rooting zone is water being taken), so that in the near future we can grasp better how much of the soil profile needs to be recharged during each irrigation cycle under drip, microjet, furrow, and flood irrigation practices. This work will be examined in relationship to soil type and location within the Lower Rio Grande Valley (LRGV).

4. ***What is the plan for 2007?***

Install water meters by late March, on Sharyland Orchards to utilize three different types of irrigation on one site; microjet, drip, and narrow bordered flood.

Collect basic bulk density figures for each collaborator cropping site for evaluation of water percolation.

Continue relationship with established collaborators and install purchased soil moisture monitoring equipment, rain gauges and most importantly focus on accurate water metering (supplying meters to collaborators, if needed).

Monitor soil quality parameters under low-water use irrigation systems over time. Such as, evaluation of soil salinity increases under drip or microjet irrigation vs. flood in the Lower Rio Grande Valley.

Establish the baseline irrigation needs for growers involved in demonstration sites, and evaluate water and irrigation use efficiency from these locations.

Increase Heriberto Esquivel to TAMUK ADI Project Manager to oversee graduate and undergraduate student laborers involved in project data collection and managing data collection with ADI collaborators/growers.

Harlingen Irrigation District
Agricultural Water Conservation
Demonstration Initiative
HID, TAMUK, TCE Combined
Demonstration Site Summaries
For the 2006 Growing Season

Harlingen Irrigation District CC 1

Table of Contents

1. Site summary introduction

The following pages contain summaries of the demonstration sites maintained by all entities involved in the Agricultural Water Conservation Demonstration Initiative. Each site is designated by a site number, these site designations were developed to maintain the anonymity of the producers involved in the program. The first digit is the entity responsible for gathering data from the site, the second digit is the producer, and the third digit is a letter designating the field within the site. Site numbers beginning with "0" or "1" are maintained by Texas A&M Kingsville under the direction of Dr. Shad Nelson. Site numbers beginning with "2" or "3" are maintained by Texas A&M Extension Center under the direction of Dr. Juan Enciso. The sites beginning with "4" or "5" are maintained by Harlingen Irrigation District under the direction of Danny Allen. The economic summaries are provided by Texas A&M Extension FARM Assistance under the direction of Dr. Steven Klose and Mac Young.

2. Site: #01A Hidalgo County, Rio Red Grapefruit

Site Description:

73 Acres
Reynosa silty clay loam
Rio Red grapefruit
Narrow bordered flood, polypipe
Field characteristics if known- unknown
Fertilizer applied: 600lbs/ac 12-24-12, late April '06; 10 gal/ac 20-0-0-40, late July '06
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", and 24" depths; ECRN-50 Rain gauge and turbine-type flow meter

Collaborator #1A McAllen TX

Date	Acres Watered	Water used ac/ft
Early Nov 05	73	25.535
Late Nov 05	73	25.586
Late Jan 06	50	16.79
Mid March	22	7.131
Early April	53	26.6
Late April	22	9.59
Prod. 05-06 Harvest, 73 acres, 1305.2 Tons		
Early May 06	51	24.194
Late May	22	7.723
Early June	51	20.053
Late June	22	8.25
Early July	31	10.2
Mid/Late July	106	43.53
August	73	32.12
Early Sept	32	12.5
Early Nov	73	32.66
Early Dec	[illegible]	[illegible]

	Totals 2006 inch	Totals 2006 cummlative	Totals 2005 inch	Totals 2005 cummlative
Jan	0.08	0.08	1.02	1.02
Feb	0.13	0.21	0.96	1.98
Mar	0.55	0.76	0.4	2.38
April	0.01	0.77	0.02	2.4
May	0.73	1.5	1.78	4.18
June	0.35	1.85	0.5	4.68
July	3.4	5.25	7.37	12.05
Aug	0.76	6.01	1.85	13.9
Sept	11.22	17.23	1.08	14.98
Oct	1.73	18.96	1.34	16.32
Nov	0.1	19.06	0.4	16.72
Dec	2.73	21.79	0.48	17.2
	21.79	Total 2006 year	17.2	Total 2005 year

Irrigation schedule and amounts:

Total Irrigation: **2.81 ac-ft/ac** Or **17.08 ac-in/ac**

Irrigation method:

Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using berms in between rows (Grapefruit).

Observations made during the crop season:

11 inches of rainfall during September most likely changed the sugar composition of Rio Red grapefruit.

Yield:

1305.2 tons

Water use summary:

Irrigation use efficiency, yield/irr. (IUE): **18.20 (lbs/ac-in)/tree**.
Water use efficiency, yield/(irr.+rain) (WUE): **8.66 (lbs/ac-in)/tree**.

Economic Summary: Demonstration Site 1A

The Demonstration Site 1A analysis consists of a 10-year financial outlook (2006-2015) for the 73 acres of Rio Red grapefruit under narrow border flood irrigation. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $200/ton. 2006 producer costs and overhead charges are producer estimated rates.

Total cash receipts average $3,606/acre over the 10-year period and cash costs average $1,260/acre, including $100/acre irrigation costs. Net cash farm income (NCFI) averages $2,346/acre due largely to the price being held at a constant $200/ton. The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $274/acre to $4,849/acre.

3. Site: #01B, Hidalgo County, Valencia Orange

Site Description:

15 Acres
Reynosa silty clay loam
Valencia Orange
Narrow bordered flood, polypipe

McAllen TX

	Totals 2006			Totals 2005	
	inch	cummlative		inch	cummlative
Jan	0.08	0.08	Jan	1.02	1.02
Feb	0.13	0.21	Feb	0.96	1.98
Mar	0.55	0.76	Mar	0.4	2.38
April	0.01	0.77	April	0.02	2.4
May	0.73	1.5	May	1.78	4.18
June	0.35	1.85	June	0.5	4.68
July	3.4	5.25	July	7.37	12.05
Aug	0.76	6.01	Aug	1.85	13.9
Sept	11.22	17.23	Sept	1.08	14.98
Oct	1.73	18.96	Oct	1.34	16.32
Nov	0.1	19.06	Nov	0.4	16.72
Dec	2.73	21.79	Dec	0.48	17.2
	21.79	Total 2006 year		17.2	Total 2005 year

Irrigation Efficiency Numbers:

Irrigation method: Farmer uses 12” concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using berms in between rows (Valencia).

Observations made during the crop season:

Yield: 115 tons

Economic Summary: Demonstration Site 01B

The Demonstration Site 1B analysis consists of a 10-year financial outlook (2006-2015) for the 15 acres of Valencia oranges under narrow border flood irrigation. The orchard was assumed to be five years old. The Valencia orange price is held constant at $150/ton. 2006 production costs and overhead charges are producer estimated rates.
Total cash receipts average $2,103/acre over the 10-year period and cash costs average $1,199/acre, including $100/acre irrigation costs. Net cash farm income (NCFI) averages $904/acre due largely to the price being held at a constant $150/ton and increasing yields through 2009 as trees mature. The risk associated with prices and yields suggests a 17.3% chance of negative NCFI. In a normal production year, NCFI could range as much as -$733/acre to $3,000/acre. Reflecting the potential of negative NCFI, the probability of carryover debt is 22% in 2007 and then declines to 2% or less by 2013.

4. Site: #01C, Hidalgo County, Rio Red Grapefruit

Site Description:

85Acres
Rio Grande silt loam
Rio Red Grapefruit
Narrow bordered flood, polypipe
Field characteristics if known- unknown
Fertilizer applied: unknown

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6”, 12”, and 24” depths; ECRN-50 Rain gauge and turbine-type flow meter.

	Collaborator #1C	
Date	Acres Watered	Water used ac/ft
Early Nov 05	100	29.221
Late Nov 05	65	28.794
Jan 06	100	29.035
Mid March	35	14.989
Late April	100	37.093
Prod. 05-06 Harvest, 85acres, Rio Red-1460.1Tons		

McAllen TX					
	Totals 2006			Totals 2005	
	inch	cummlative		inch	cummlative
Jan	0.08	0.08	Jan	1.02	1.02
Feb	0.13	0.21	Feb	0.96	1.98
Mar	0.55	0.76	Mar	0.4	2.38
April	0.01	0.77	April	0.02	2.4
May	0.73	1.5	May	1.78	4.18
June	0.35	1.85	June	0.5	4.68
July	3.4	5.25	July	7.37	12.05
Aug	0.76	6.01	Aug	1.85	13.9
Sept	11.22	17.23	Sept	1.08	14.98
Oct	1.73	18.96	Oct	1.34	16.32
Nov	0.1	19.06	Nov	0.4	16.72
Dec	2.73	21.79	Dec	0.48	17.2
	21.79	Total 2006 year		17.2	Total 2005 year

Irrigation schedule and amounts:

Total Irrigation:

1.64 ac.ft./ac. Or 19.64 ac-in/ac

Irrigation method:

Farmer uses 12” concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using berms in between rows (Grapefruit).

Observations made during the crop season:

11 inches of rainfall during September most likely changed the sugar composition of Rio Red grapefruit.

Yield:

1460.1 tons

Water use summary:

Irrigation use efficiency, yield/irr. (IUE): **9.23 (lbs/ac-in)/tree**.

Water use efficiency, yield/(irr.+rain) (WUE): **6.29 (lbs/ac-in)/tree**.

Economic Summary: Demonstration Site 1C

The Demonstration Site 1C analysis consists of a 10-year financial outlook (2006-2015) for the 85 acres of Rio Red grapefruit production under narrow border flood irrigation. The orchard was assumed to be 5 years old. The Rio Red grapefruit price is held constant at $200/ton. 2006 production costs and overhead charges are producer estimated rates.

Total cash receipts average $4,426/acre over the 10-year period and cash costs average $1,204/acre, including $100/acre irrigation costs. Net cash farm income (NCFI) averages $3,222/acre due largely to the price being held at a constant $200/ton and increasing yields from maturing trees. The risks associated with prices and yields suggest a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $388/acre to $6,600/acre.

5. Site: # 01D, Hidalgo County, White/Red Onion

Site Description:

12 Acres
Rio Grande silt loam
White/Red Onion variety
Sub-surface drip, single line, 18 emitter spacing at 0.4 gpm, 6 rows onion on 48" bed, 80" center to center

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6"center, 6"off center 12"center, 12"off center and 24"center depths; ECRN-50 Rain gauge

Irrigation schedule and amounts:

29.3 ac.in/ac, IUE= 2,561.12 lbs /ac.in. ; WUE= 1180.8 lbs/ac.in

McAllen TX					
	Totals 2006		Totals 2005		
	inch	cummlative		inch	cummlative
Jan	0.08	0.08	Jan	1.02	1.02
Feb	0.13	0.21	Feb	0.96	1.98
Mar	0.55	0.76	Mar	0.4	2.38
April	0.01	0.77	April	0.02	2.4
May	0.73	1.5	May	1.78	4.18
June	0.35	1.85	June	0.5	4.68
July	3.4	5.25	July	7.37	12.05
Aug	0.76	6.01	Aug	1.85	13.9
Sept	11.22	17.23	Sept	1.08	14.98
Oct	1.73	18.96	Oct	1.34	16.32
Nov	0.1	19.06	Nov	0.4	16.72
Dec	2.73	21.79	Dec	0.48	17.2
	21.79	Total 2006 year		17.2	Total 2005 year

Irrigation method:

Single line drip line

Observations made during the crop season:

Yield: 17.2 tons or 34,395 total pounds

6. Site: #01E, Hidalgo County, Yellow Onion

Site Description:

52 Acres
Rio Grande silt loam
Yellow Onion, Cougar var.

Irrigation Method:

Sub-surface drip, single line, 18 emitter spacing at 0.4 gpm, 6 rows onion on 80”bed

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6” off-center, 18”off-center, 6”center, and 30”center depths; ECRN-50 Rain gauge. Irrigation was maintained by portable sand filter/ pump combination and metered each time.

Collaborator #1E- Onions		
Date	**Acres Watered**	**Water used ac/ft**
October	52	9.5
	52	8.95
	52	5.36
	52	3.54
	52	2.51
	52	2.58
	52	4.49
	52	2.3
	52	2.15
	52	4.85
	52	3.49
March	52	4.58
Prod. 05-06 Harvest, 52 acres,Yield- 831.5 Tons		

Onion Season Rainfall Oct '06/ March '07		
	inch	**cummlative**
Oct	**3.88**	**3.88**
Nov	**0.34**	**4.22**
Dec	**3.22**	**7.44**
Jan	**2**	**9.44**
Feb	**1.15**	**10.59**
13-Mar	**0.27**	**10.86**

Irrigation schedule and amounts:

Total Irrigation: 1.12 ac.ft./ac. Or 13.41 ac-in/ac

Irrigation method:

Farmer uses single sub-surface drip line w/ emitters every 18 inches buried at approximately 4-6 inches. Irrigation water is supplied to field with portable sand filter/ pump combination trailer.

Observations made during the crop season:

Equipment malfunction of the data logger caused loss of data during the month of February.

Yield:

831.5 tons or 33,261bags @ 50lbs

Water use summary:

Irrigation use efficiency, yield/irr. (IUE): **2384.6 (lbs/ac-in).**
Water use efficiency, yield/ (irr.+rain) (WUE): **1098.58 (lbs/ac-in)**.

Economic Summary: Demonstration Site 1E

The Demonstration Site 1C analysis consists of a 10-year financial outlook (2006-2015) for the 52 acres of yellow onions production under 1-line drip irrigation. The onions were planted on 80-inch beds. The yellow onions cash receipts were calculated on a $1,150/acre basis and held constant during the 10-year projection. 2006 costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a 1-line drip irrigation system at a cost of $1,550 per acre, including projected drip tape replacement. The 1-line drip system expense is evenly distributed ($155/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $1,150/acre over the 10-year period and cash costs average $1,047/acre, including $90/acre variable irrigation costs. Net cash farm income (NCFI) averages $103/acre due largely to gross receipts per acre being held at a constant $1,150 per acre. The risk associated with prices and yields suggests a 29.1% chance of negative NCFI. In a normal production year, NCFI could range as much as -$385/acre to $519/acre.

7. Site: # 02A; Hidalgo County, Citrus- Henderson Grapefruit

Site Description:

14 Acres
Hidalgo sandy clay loam

Field characteristics:

Sandy loam found at 6” and 12” levels; sandy clay loam at 24” levels

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6”, 12”, 24” and 36” depths.

Irrigation schedule and amounts:

No current water usage numbers at this time. Watered every 4 to 5 weeks during the summer months; approx. 240 gal/week per tree

Irrigation Efficiency Numbers:

no meters installed on site, currently installing metering devices

Irrigation method:

Narrow Bordered Flood

Observations made during the crop season:

Watered every 4 to 5 weeks during the summer months; approx. 240 gal/week per tree

Yield: Production average:

355 tons 2004-2005, 200 tons 2005-2006

8. Site: # 02B; Hidalgo County, Citrus- Rio Red Grapefruit

Site Description:

5 Acres
Hidalgo fine sandy clay loam, Brennan fine sandy loam

Field characteristics:

Sandy clay loam found at all levels

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", 24" and 36" depths; ECRN-50 rain gauge

Irrigation schedule and amounts:

No current water usage numbers at this time. Watered 48 hours/week during summer months; approximately 240 gal/week per tree

Irrigation Efficiency Numbers:

No meters installed on site, currently installing metering devices

Irrigation method:

Micro-jet sprayer

Observations made during the crop season:

Watered every 4 to 5 weeks during the summer months; approx. 240 gal/week per tree. Carrizo, Sour orange and Swingle root stocks used on this plot.

Yield: Production average:

56 tons 2004-2005, 86 tons 2005-2006

9. Site: # 02C; Hidalgo County, Citrus- Rio Red Grapefruit

Site Description:

4 Acres
Hidalgo fine sandy clay loam

Field characteristics:

Sandy clay loam found at all levels

Sensor information:

No data sensor equipment installed. Waiting on metering devices and drip equipment repair

Irrigation schedule and amounts:

No data.

Irrigation Efficiency Numbers:

No meters installed on site, currently installing metering devices

Irrigation method:

Single line Drip system

Observations made during the crop season:

This site is newly established and not completely equipped. The site will be completely operational for the 2007 crop year.

10. Site: # 03A; Cameron County, Rio Red Grapefruit

Site Description:

41.3 Acres
Hidalgo sandy clay loam
Rio Red grapefruit
Traditional flood,

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6”, 12”, and 24” depths; ECRN-50 Rain gauge

Irrigation schedule and amounts:

No current water usage numbers at this time.

Irrigation Efficiency Numbers:

Irrigation method:

Traditional flood.

Observations made during the crop season:

This site is set up with high mounted (30”) freeze protection watering system. This system could be set up as drip or micro jet irrigation in the future.

Yield:

283 tons

11. Site: # 04A; Hidalgo County, Citrus- Rio Red Grapefruit

Site Description:

86 Acres
Hidalgo sandy clay loam

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6”, 12”and 24” center depths; ECRN-50 Rain gauge. Installed Watermark sensors at identical depths with Watch Dog data logger for grower to use visual readings to aid in soil moisture indication.

Irrigation schedule and amounts:

No current water usage numbers at this time.

Irrigation Efficiency Numbers:

Still harvesting at this time.

Irrigation method:

Single drip line

Observations made during the crop season:

Minimal sheep nose effect on grapefruit was noticed on 2006 crop. Sandy clay loam found to a depth of 24”; at 36” levels found clay soils.

Yield:

Unknown

12. Site: # 04B; Hidalgo County, Citrus- Rio Red Grapefruit

Site Description:

30 Acres
Hidalgo sandy clay loam

Field characteristics:

Clay loam at 6” level; clay at lower levels

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6”, 12”and 24” center depths

Irrigation schedule and amounts:

No current water usage numbers at this time.

Irrigation Efficiency Numbers:

Still harvesting at this time.

Irrigation method:

Micro jet spray

Observations made during the crop season:

Minimal sheep nose effect on grapefruit was noticed on 2006 crop.

Yield:

Unknown

13. Site: # 05A; Willacy County, White Onion

Site Description:

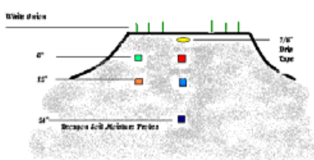
35.3 Acres
Hidalgo sandy clay loam (37%), Raymondville clay loam (63 %)
White Onions
Single 7/8” drip line, 4-6 inches buried, 18 emitter spacing, 6 rows on a 48” bed.

Field characteristics:

0 – 1% slope

Sensor information:

Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6” center, 6” off center, 12” off center, 12”center, and 24” center depths; ECRN-50 Rain gauge



Irrigation schedule and amounts:

No current water usage numbers at this time.

Irrigation method:

Single drip line

Observations made during the crop season:

Mobile filtration and pump assembly used for irrigation of onion.

Yield:

283 tons

14. Site: #06A, Hidalgo County, Rio Red Grapefruit

Site Description:

1.1 Acres
Cameron silty clay Rio Red grapefruit

Irrigation type:

Single line drip/ Micro jet spray

Fertilizer applied:

1 lb N/ tree

Sensor information:

Soil moisture: Watch Dog data logger, Watermark soil moisture sensors, Sensors set at 6”, 12”, and 24” and 36” depths; ECRN-50 Rain gauge and 1” turbine-type flow meter

Irrigation schedule and amounts:

Irrigation on both drip and micro jet rows were maintain following 70 % ET measurements.

Observations made during the crop season:

Using ET requirements on grapefruit caused minimum yields and high incurrence of phytophora and dieback on this plot.

15. Site: #06B, Hidalgo County, Rio Red Grapefruit

Site Description:

2.0 Acres
Soil type: Cameron silty clay

Irrigation type:

Tradition Flood

Fertilizer applied:

1 lb N/ tree

Sensor information:

Soil moisture: Watch Dog data logger, Watermark soil moisture sensors, Sensors set at 6”, 12”, and 24” and 36” depths; ECRN-50 Rain gauge and 6” turbine-type flow meter

Irrigation schedule and amounts:

Irrigation by traditional flood every 4 to 5 weeks

Observations made during the crop season:

Normal Lower Rio Grande Valley yields. Pruning caused decline in yields during years 2005-2006.

16. Site #21A

Site Description:

Acres: 3.5
Soil type: Sandy Loam (from 12 to 36-inch depth)
Crop Variety: Cotton FM 832 (P 02/02/06; H 08/04/06)
Irrigation system: furrow (by poly-pipe)
Field characteristics: 40-inch beds; 900 foot-long rows; population of 52,000 plants/acre
Fertilizer applied: total NPK 68-43-1 (side dressing)
type 20-10-0-4 (30gal/ac) & 4-29-2 (3 gal/ac)

Sensor and flow meter information:

Watermark and Echo-20 probes (12, 24 & 36-inch depth) connected to data loggers
Portable flow meter

Irrigation schedule and amounts:

Total irrigation of 18 inches/acre in 2 events (including 10 inches at pre-plant)
Total rainfall of 11.8 inches/acre
Total water input of 29.8 inches/acre

Irrigation method:

Heavy irrigation at planting to hydrate de dry profile; irrigation scheduling was not based on soil moisture; water was running until it reached the end of the furrows; water was provided by the district (pipeline)

Observations made during the crop season:

Cracking soil was giving inaccurate soil moisture readings at some point

Yield:

571 lbs/acre (1.2 bale/acre based on 471 lbs/bale)

Water use summary:

IUE: 31.7 lbs/inch of water applied by irrigation
WUE: 19.2 lbs/inch of water received (irrigation + rainfall)

17. Site #21B

Site Description:

Acres: 100.0
Soil type: Sandy Loam (from 12 to 36-inch depth)
Crop Variety: Cotton FM 832 (P 02/02/06; H 08/04/06)

Irrigation system:

Furrow (by poly-pipe)
Field characteristics: 40-inch beds; 2,360 foot-long rows; population 52,000 plants/acre
Fertilizer applied: total NPK 68-43-1 (side dressing) type 20-10-0-4 (30gal/ac) & 4-29-2 (3 gal/ac)

Sensor and flow meter information:

Echo-10 probes (12, 24 & 36-inch depth) connected to data logger
Portable flow meter

Irrigation schedule and amounts:

Total irrigation of 22 inches/acre in 3 events (including 10 inches at pre-plant)
Total rainfall of 11.8 inches/acre
Total water input of 33.8 inches/acre

Irrigation method:

Heavy irrigation at planting to hydrate de dry profile; irrigation scheduling was not based on soil moisture; water was running until it reached the end of the furrows; water was provided by the district (pipeline)

Observations made during the crop season:

Due to the long length of rows, it appeared that maturity varied significantly from the beginning (most water received) to the end of the rows (least water received)

Yield:

820 lbs/acre (1.8 bale/acre based on 451 lbs/bale)

Water use summary:

IUE: 37.3 lbs/inch of water applied by irrigation
WUE: 24.3 lbs/inch of water received (irrigation + rainfall)
Site Information Form

18. Site #:22

Site Description:

Acres: 3.0
Soil type: Loam (from 6 to 12-inch depth) and Silt Loam (18-inch depth)
Crop Variety: Honeydew Musk melon honey brews (P 02/13/06 and H 05/10 to 05/30/06)
Irrigation system: SDI
Field characteristics: 80-inch beds under black plastic mulch
Fertilizer applied: total NPK 153-98-21 (fertigation)
type 4-29-2 (20gal/ac), N32 (20 gal/ac), 9-0-0-11 (40 gal/ac) and 12-12-6 (25 gal/ac)

Sensor and flow meter information:

Watermark (6, 12 & 18-inch depth) and irrigation sensors connected to data logger
Water meter installed on one drip line

Irrigation schedule and amounts:

Total irrigation of 10 inches/acre
Total rainfall of 1.3 inch/acre
Total water input of 11.3 inches/acre

Irrigation method:

Irrigation scheduling was not based on soil moisture; each irrigation event was watering the 9-acre block (tomato, pepper, honeydew); water was pumped directly from the river (sand media filtration system)

Observations made during the crop season:

Logger wasn't working properly during the first month: moisture readings had to be estimated

Yield:

39,000 lbs/acre

Water use summary:

IUE: 3,939 lbs/inch of water applied by irrigation
WUE: 3,482 lbs/inch of water received (irrigation + rainfall)

19. Site #23

Site Description:

Acres: 10.0
Soil type: Sandy Clay Loam (12 and 36-inch depth) and Sandy Clay (24-inch depth)
Crop Variety: Valencia Oranges (Planted 1999)
Irrigation system: Micro-Jets (1 sprinkler/tree)
Field characteristics: population of 115 trees/acre, bare ground
Fertilizer applied: not known

Sensor and flow meter information:

Watermark (12, 24 & 36-inch depth) and irrigation sensors connected to data logger
Water meter installed on one drip line

Irrigation schedule and amounts:

Total irrigation of 3.4 inches/acre
Total rainfall of 17.8 inch/acre
Total water input of 21.2 inches/acre

Observations made during the crop season:

No irrigation since June 2006; sensors replaced at 6, 12 and 24-inch depth in December 2006

Yield:

15,812 lbs/acre (for season 2005-2006)

Water use summary:

IUE: 4,651 lbs/inch of water applied by irrigation
WUE: 746 lbs/inch of water received (irrigation + rainfall)

20. Site #:24

Site Description:

Acres: 7.0
Soil type: Sandy Clay Loam (up to 24-inch depth) and Clay Loam (below 30-inch depth)
Crop Variety: Rio Red Grapefruits (Planted 1993)

Irrigation system:

Flood
Field characteristics: population of 140 trees/acre, laser leveled bare ground
Fertilizer applied: 500 lbs/ac of ammonium sulfate at early bloom, and more (unknown)

Sensor and flow meter information:

Echo-20 probes (2-10, 16-24, 30-38 & 44-52-inch depth)
Portable flow meter

Irrigation schedule and amounts:

Total irrigation of 31.5 inches/acre
Total rainfall of 30.8 inch/acre
Total water input of 62.3 inches/acre

Irrigation method:

There is a border every other row and each pan is irrigated by one alfa-alfa valve (connected to canal: water provided by the district) until water fills in at the opposite side. Since the grower has a capacity of two heads, he opens four valves at a time (four pans). The design of his system allows him to apply about 3.5 inch for each irrigation. Water advances on the laser leveled ground 100 feet within 20 minutes. Irrigation scheduling was not based on soil moisture.

Yield:

72,600 lbs/acre (for season 2005-2006)

Water use summary:

IUE: 2,305 lbs/inch of water applied by irrigation
WUE: 1,165 lbs/inch of water received (irrigation + rainfall)

21. Site #:25

Site Description:

Acres: 56.0
Soil type: Silt Clay (from 6 to 18-inch depth)
Crop Variety: Sweet Sunrise Onion (P 10/11/05 and 04/15/06)

Irrigation system:

SDI (ref. 508-12-450)
Field characteristics: 80-inch beds (4 lines/bed); population of 48,135 plants/acre
Fertilizer applied: total NPK 36-98-6 (fertigation) type 4-29-2 (30gal/ac) and N32 (20 gal/ac)

Sensor and flow meter information:

Watermark (6, 12 & 18-inch depth) and irrigation sensors connected to data loggers
Water meter installed on one drip line
Irrigation schedule and amounts:
Total irrigation of 23.8 inches/acre
Total rainfall of 6.1 inches/acre (including 2.8 inches that occurred before planting)
Total water input of 29.9 inches/acre

Irrigation method:

Irrigation scheduling was not based on soil moisture; water was pumped directly from the river (sand media filtration system)

Observations made during the crop season:

Logger wasn't working properly during the first month: moisture readings had to be estimated

Yield:

37,100 lbs/acre

Water use summary:

IUE: 1,563 lbs/inch of water applied by irrigation
WUE: 1,372 lbs/inch of water received (irrigation + rainfall)

22. Site #:26

Site Description:

Acres: 15.7
Soil type: Sandy Loam (from 6 to 12-inch depth) and Sandy Clay Loam (18-inch depth)
Crop Variety: Cougar Onion (P 10/13/05 and 03/21/06)

Irrigation system:

SDI (ref. 508-08-340)
Field characteristics: 40-inch beds (4 lines/bed); population of 81,900 plants/acre
Fertilizer applied: total NPK 175-217-182 (broadcast and fertigation)
type 7-34-7 (273 lbs/ac), 0-0-62 (191 lbs/ac), 9-0-0 (16 gal/ac), 5-26-3 (36 gal/ac), N32 (28 gal/ac) and 8-8-8 (20 gal/ac)

Sensor and flow meter information:

Watermark (6, 12 & 18-inch depth) and irrigation sensors connected to data loggers
Water meter installed on one drip line

Irrigation schedule and amounts:

Total irrigation of 15.3 inches/acre
Total rainfall of 1.5 inch/acre
Total water input of 16.8 inches/acre

Irrigation method:

Irrigation scheduling was not based on soil moisture; water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Yield:

48,336 lbs/acre

Water use summary:

IUE: 2,643 lbs/inch of water applied by irrigation
WUE: 1,902 lbs/inch of water received (irrigation + rainfall)

23. Site #:27

Site Description:

Acres: 0.65
Soil type: Sandy Clay Loam (8-inch depth)
Crop Variety: Cougar Onion (P 11/11/05 and 04/19/06)

Irrigation system:

SDI (ref. Typhoon 875-10mil-F; 12-inch dripper spacing)
Field characteristics: 40-inch beds (2 lines/bed); population of 81,000 plants/acre; experimental block design (6 treatments replicated 3 times)
Fertilizer applied: total NPK 90-0-0 (fertigation)
type N32 (63 gal/ac. in three applications: Dec., Jan. & Mar.))

Sensor and flow meter information:

Watermark and Echo-10 sensors (8-inch depth) connected to data loggers or manual meters (daily readings)
Water meter installed on each treatment and replicate

Irrigation schedule and amounts:

Total irrigation of 9.1 in/ac. (20cb), 8.0 in/ac. (30cb), 3.6 in/ac. (50cb), 13.2 in/ac. (100% ET), 9.8 in/ac. (75% ET) and 6.6 in/ac. (50% ET)
Total rainfall of 2.0 inches/acre
Total water input variable according the treatments (add 2 inches for each irrigation amount)

Irrigation method:

Irrigation scheduling was based on Watermark sensor readings (triggered at 20, 30 and 50cb) and evapotranspiration (triggered at 50, 75 and 100% ET)

Yield:

16,400 lb/ac. (20cb); 16,800 lb/ac. (30cb); 10,300 lb/ac. (50cb); 16,100 lb/ac. (100% ET), 12,700 lb/ac. (75% ET) and 13,000 lb/ac. (50% ET)

Water use summary:

IUE (lbs/inch of water applied by irrigation): 1,810 (20cb); 2,120 (30cb); 2,870 (50cb); 1,230 (100% ET); 1,300 (75% ET) and 1,960 (50%)
WUE (lbs/inch of water received (irrigation + rainfall)): 1,480 (20cb); 1,680 (30cb); 1,830 (50cb); 1,060 (100% ET); 1,070 (75% ET) and 1,500 (50% ET)

24. Site #28A

Site Description:

Acres: 8.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Valencia Oranges (Planted 2003)

Irrigation system:

Micro-Jets (1 sprinkler/tree)
Field characteristics: population of 115 trees/acre; bare ground
Fertilizer applied: unknown

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 9.6 inches/acre
Total rainfall of 31.4 inch/acre
Total water input of 41.0 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.5 inch/acre was applied each time (total of 19 applications); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Sensors replaced at 6, 12 and 24-inch depth in December 2006

Yield:

First harvest of 1,100 lbs/acre (for season 2005-2006)

Water use summary:

IUE: 115 lbs/inch of water applied by irrigation
WUE: 27 lbs/inch of water received (irrigation + rainfall)

Economic Summary: Demonstration Site 28A

The Demonstration Site 28A analysis consists of a 10-year financial outlook (2006-2015) for the 8 acres of Valencia oranges under microjet spray irrigation. The orchard trees were assumed to be 3 years old. The Valencia orange price is held constant at $140/ton. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $1,935/acre over the 10-year period and cash costs average $1,125/acre, including $55/acre irrigation costs in 2006. Net cash farm income (NCFI) is negative in 2006-2008 reflecting lower levels of production from immature trees. It then increases from $360/acre in 2009 to about $2,000/acre in 2015. The risk associated with prices and yields suggests a minimal chance of negative NCFI after 2011 when the trees reach maturity. In a normal production year and mature trees (2011-2015), NCFI could range as much as $438/acre to $4,250/acre. Due to negative NCFI, the probability of carryover debt is 99% or greater during 2007-2008 and then declines to 1% or less in 2013 as the trees reach maturity and annual production increases.

25. Site #:28B

Site Description:

Acres: 8.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Rio Red Grapefruits (Planted 1992)

Irrigation system:

Flood converted to drip in August 2006 (surface double line 30-inch emitter)
Field characteristics: population of 116 trees/acre; bare ground
Fertilizer applied: total NPK (fertigation) type 7-21-7 (80 gal), 28-0-0 (80 gal) and 0-0-16 (150 gal)

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 4.3 inches/acre (drip since August 2006)
Total rainfall of 31.4 inch/acre (year 2006)
Total water input of 35.7 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.6 inch/acre was applied each time (total of 7 applications since August 2006); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Monitoring started in August 2006 and sensors were replaced at 6, 12 and 24-inch depth in December 2006

Yield:

43,500 lbs/acre (for season 2005-2006)

Water use summary:

IUE (lbs/inch of water applied by irrigation): N/A since change of irrigation method during the season 2006
WUE (lbs/inch of water received (irrigation + rainfall)): N/A since change of irrigation method during the season 2006

26. Site #:28C

Site Description:

Acres: 8.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Rio Red Grapefruits (Planted 1992)

Irrigation system:

Micro-Jets (1 sprinkler/tree)
Field characteristics: population of 116 trees/acre; bare ground
Fertilizer applied: total NPK (fertigation) type 7-21-7 (80 gal), 28-0-0 (80 gal) and 0-0-16 (150 gal)

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 31.3 inches/acre (including 6 inches by flood)
Total rainfall of 31.4 inch/acre
Total water input of 62.7 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.8 inch/acre was applied each time by Micro-Jet (total of 33 applications); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Sensors were replaced at 6, 12 and 24-inch depth in December 2006

Yield:

61,000 lbs/acre (for season 2005-2006)

Economic summary:

IUE: 1,949 lbs/inch of water applied by irrigation
WUE: 973 lbs/inch of water received (irrigation + rainfall)

Economic Summary: Demonstration Site 28C

The Demonstration Site 28C analysis consists of a 10-year financial outlook (2006-2015) for the 8 acres of Rio Red grapefruit under microjet spray irrigation. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $150/ton. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $3,296/acre over the 10-year period and cash costs average $1,173/acre, including $110/acre variable irrigation costs. Net cash farm income (NCFI) averages $2,123/acre due largely to the price being held at a constant $150/ton. The risks associated with prices and yields suggest a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $750/acre to $4,375/acre.

27. Site #:28D

Site Description:

Acres: 7.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Marrs and Navel (Planted 1991)

Irrigation system:

Drip (surface double line 30-inch emitter)
Field characteristics: population of 115 trees/acre; bare ground
Fertilizer applied: total NPK (fertigation)
type 7-21-0 (70 gal), 28-0-0 (80 gal), 9-0-0 (110 gal) and 0-0-16 (90 gal)

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 33.7 inches/acre (including 6 inches by flood)
Total rainfall of 31.4 inch/acre
Total water input of 65.1 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.7 inch/acre was applied each time (total of 42 applications by drip); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Sensors were replaced at 6, 12 and 24-inch depth in December 2006

Yield:

32,000 lbs/acre (for season 2005-2006) / 26,000 lbs/acre (season 2006-2007)

Water use summary:

IUE: 772 lbs/inch of water applied by irrigation
WUE: 399 lbs/inch of water received (irrigation + rainfall)

Economic Summary: Demonstration Site 28D

The Demonstration Site 28D analysis consists of a 10-year financial outlook (2006-2015) for the 7 acres of early oranges (3.5 acres of Marrs & 3.5 acres Navel) under 2-line drip irrigation. The orchard was assumed to have mature trees. The early orange price is held constant at $115/ton. 2006 production costs and overhead charges are producer estimates.

The analysis also includes the purchase and use of a 2-line drip system at a cost of $1,000 per acre. The 2-line drip system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $1,836/acre over the 10-year period and cash costs average $923/acre, including $110/acre variable irrigation costs. Net cash farm income (NCFI) averages $913/acre due largely to the price being held at a constant $115/ton. The risks associated with prices and yields suggest a small chance of negative NCFI. In a normal production year, NCFI could range as much as -$143/acre to $2,571/acre.

28. Site #:29

Site Description:

Acres: 2.6
Soil type: Sandy Clay Loam (from 12 to 36-inch depth)
Crop Variety: Cotton DP 444 (P 02/28/06; H 08/04/06)

Irrigation system:

Low Pressurized SDI (2-3 PSI) by poly-pipe
Field characteristics: 40-inch beds; 50 to 450 foot-long rows; population of 52,000 plants/acre Fertilizer applied: total NPK 100-0-0 (fertigation) type N32 (70gal/ac in two applications)

Sensor and flow meter information:

Watermark and Echo-10 probes (12, 24 & 36-inch depth) connected to manual meters (daily readings)
Installed 2-inch water meter

Irrigation schedule and amounts:

Total irrigation of 6.3 inches/acre in 31 applications
Total rainfall of 5.3 inches/acre
Total water input of 11.6 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture but it was not possible to provide enough water to fulfill the crop water requirements; water was provided by the district (canal) and filtered with a 2-inch disk filter (mesh 125)

Observations made during the crop season:

Soil moisture readings were always very low after full bloom stage. Irrigation uniformity was excellent (>96%) throughout the whole system at 3 PSI

Yield:

1,276 lbs/acre (2.6 bales/acre based on 491 lbs/bale)

Water use summary:

IUE: 202.5 lbs/inch of water applied by irrigation
WUE: 110 lbs/inch of water received (irrigation + rainfall)

29. Site # 41, Field 41A and 41B Spring 2006

Site Description:

The 38 acre field was planted in cotton and although divided into two sections, the entire field was surge irrigated. The soil type is Harlingen Clay (HA). The field has a slope of .0005' to the West and the same slope to the North.

Sensor Installation:

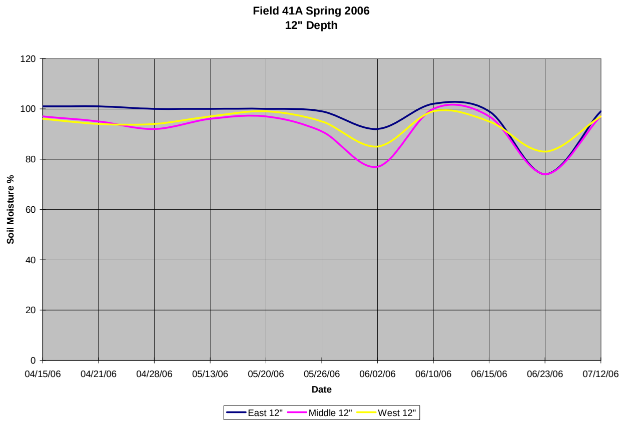
One row located 50 rows from the North side were selected. Three sensor sites were installed along this row. The East site was 100' inside the field, the Middle site was 640' inside the field and the West site was 100' inside the field. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 12", 18", 24" and 30". A McCrometer flow meter was used to measure the amount of water applied.

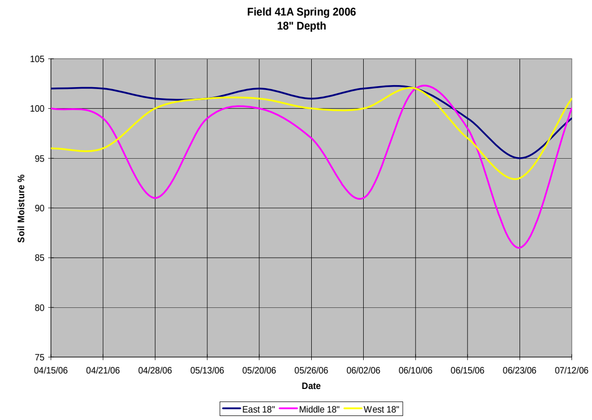
Irrigation Schedule:

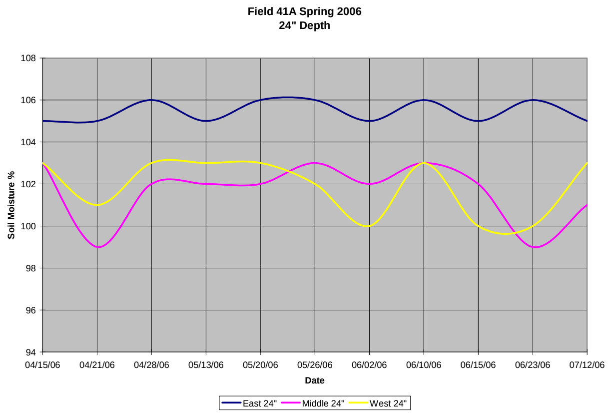
Date	Water Applied per Acre
3/12	5.47"
5/7	6.23"
6/5	6.41"
6/23	7.04"
	Total 25.15"

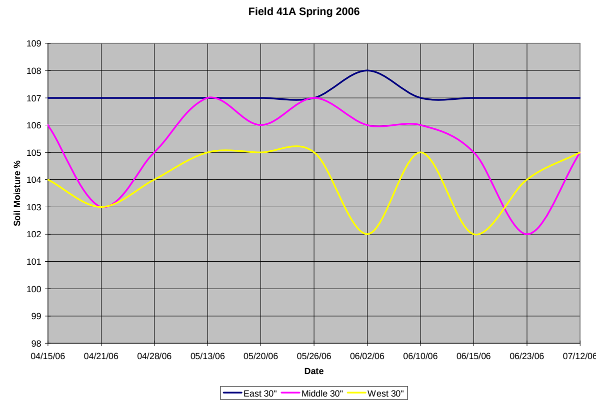
Irrigation Method:

The surge controller was programmed to complete the irrigation cycle in 24 hours with the first alternation to occur at the 5 hour interval. The cooperator used 18" diameter polypipe. The surge controller was programmed to alternate 3 cycles in a 24-hour period. The row length is 1280'.









Observations:

The surge technology allows the grower to select alternation intervals at will, the shorter the interval, the greater the water savings. The difficulty is keeping the polypipe from tearing during the multiple inflate/deflate cycles. Selecting only three alternations in a 24-hour set insured a timely irrigation event while keeping application rates at 7” per acre or less.

The 24” and 30” depth charts show little change in the soil moisture throughout the active growing season. Part of the reason is the 64” wide row pattern with the cotton plants on 32” centers. The Aqua-Pro tubes were installed in the center of the raised bed, 16” away from the cotton plants. The 6” depth charts show substantial fluctuations in soil moisture mostly due to the soil cracking and breaking contact with the buried sensor tube. The 12” depth curve is the one to watch for irrigation scheduling with cotton. The Aqua-Pro system works well in providing soil moisture vs. date trends at various depths which the grower can use to schedule irrigations.

Economic Summary: Demonstration Site 41

The Demonstration Site 41 analysis consists of a 10-year financial outlook (2006-2015) for the 38.5 acres of cotton production under surge irrigation. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.59/lb., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a surge valve at a cost of $1,800. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

Total cash receipts average $878/acre over the 10-year period and cash costs average $571/acre, including $53/acre irrigation costs. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Net cash farm income (NCFI) increases throughout the 10-year period from $228/acre in 2006 to $364/acre in 2015. The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $208/acre plus or minus the average expected NCFI for the site.

30. Site # 42, Field 42A Spring 2006

Site Description:

The 66 acre field was planted in grain sorghum. Surge irrigation technology was used with 21" polypipe. The soil type at the NW and NE sensor site is Harlingen clay (HA), at the SW sensor site the soil type is Laredo Silty Clay Loam (LAA), and the SE sensor site soil type is Laredo-Reynosa complex (LEA).

Sensor Installation:

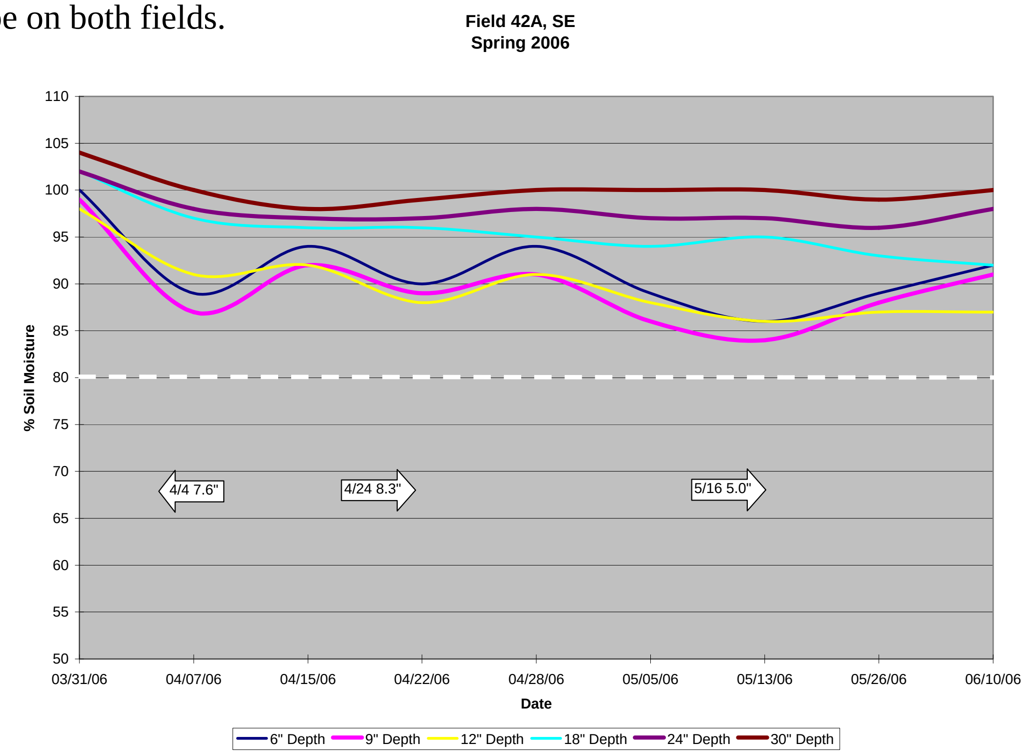
Due to the variations in soil type, sensor sites were installed in the four corners of the field. The NE site was located 150 rows from the West corner and 500' inside the field. The NW site was 50 rows from the West corner and 150' inside the field. The SW site was located 250 rows from the East corner and 500' inside the field. The SE site was 50 rows from the East corner and 150' inside the field. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 9", 12", 18", 24" and 30". A McCrometer flowmeter was used to measure the amount of water applied.

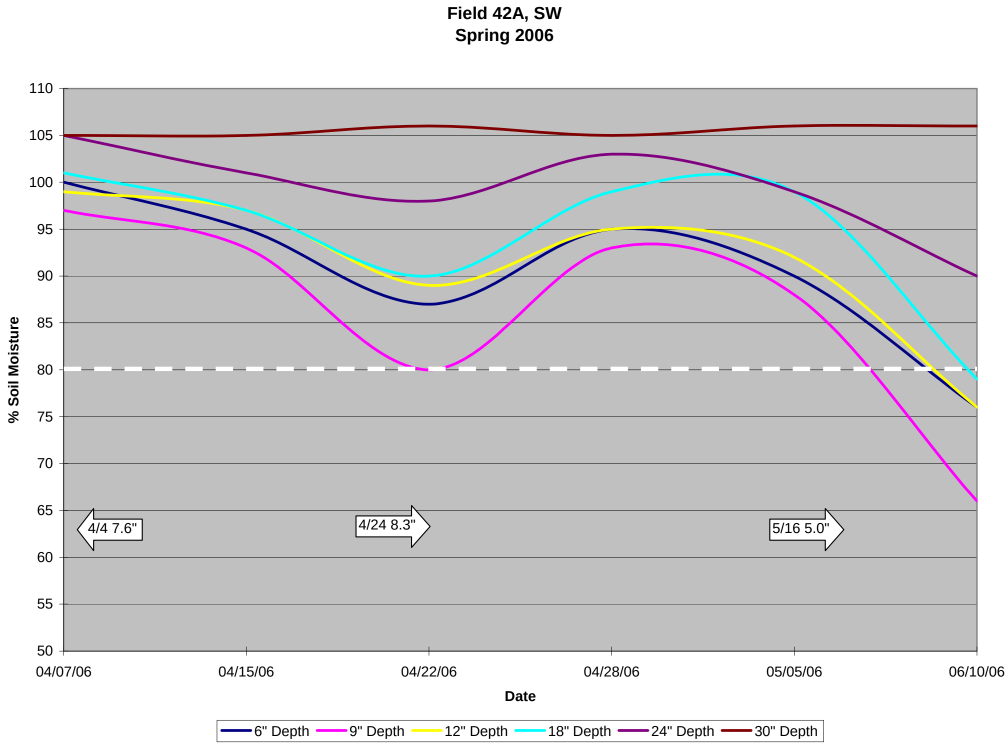
Irrigation Schedule:

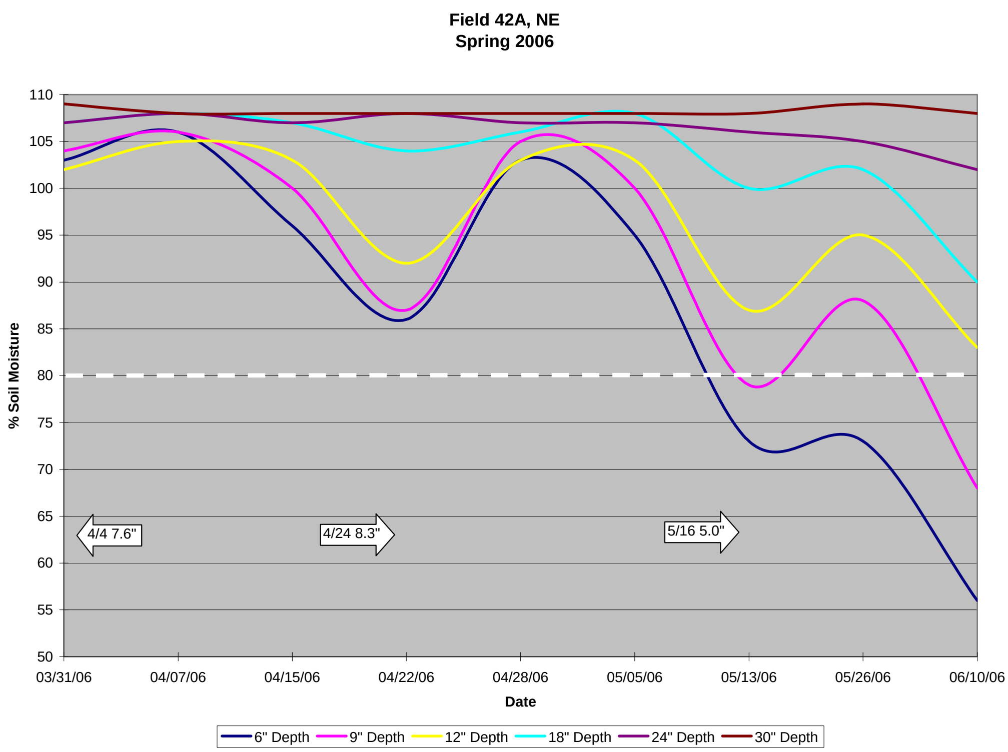
Date	Irrigation Method	Amount of Water Applied, per Acre
4/4	flooded furrow	7.6"
4/24	surge	8.3"
5/16	surge	5.0
	Total	20.9"

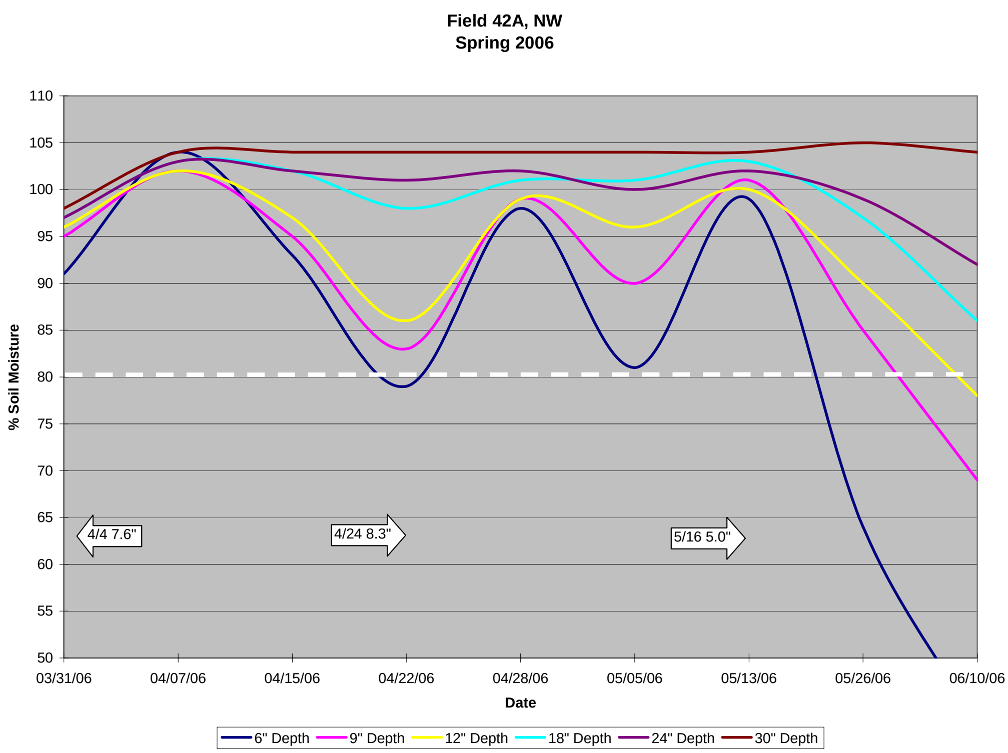
Irrigation Method:

The surge controller was programmed to complete the irrigation cycle in 24 hours with the first alternation to occur at the 5 hour interval. The cooperator used 21" diameter polypipe on both fields.






Field 42A, NE
Spring 2006
% Soil Moisture
110
105
100
95
90
85
80
75
70
65
60
55
50
4/4 7.6"
4/24 8.3"
5/16 5.0"
03/31/06
04/07/06
04/15/06
04/22/06
04/28/06
05/05/06
05/13/06
05/26/06
06/10/06
Date
6" Depth
9" Depth
12" Depth
18" Depth
24" Depth
30" Depth


Field 42A, NW
Spring 2006
% Soil Moisture
110
105
100
95
90
85
80
75
70
65
60
55
50
4/4 7.6"
4/24 8.3"
5/16 5.0"
03/31/06
04/07/06
04/15/06
04/22/06
04/28/06
05/05/06
05/13/06
05/26/06
06/10/06
Date
6" Depth
9" Depth
12" Depth
18" Depth
24" Depth
30" Depth

Observations:

The surge technology did not conserve water in the 4/24 irrigation because the polypipe burst and we were unable to separate the amount of water lost from the amount of water applied. The subsequent irrigation on 5/16 did provide considerable savings compared to the initial irrigation on 4/4. In addition to the obvious use of less water, the differences between a 5.0”/ac and 7.6”/ac irrigation can be substantial when you consider the risks of untimely rains and the undesirable effects of saturating the root zone of shallow rooted crops such as grain sorghum.

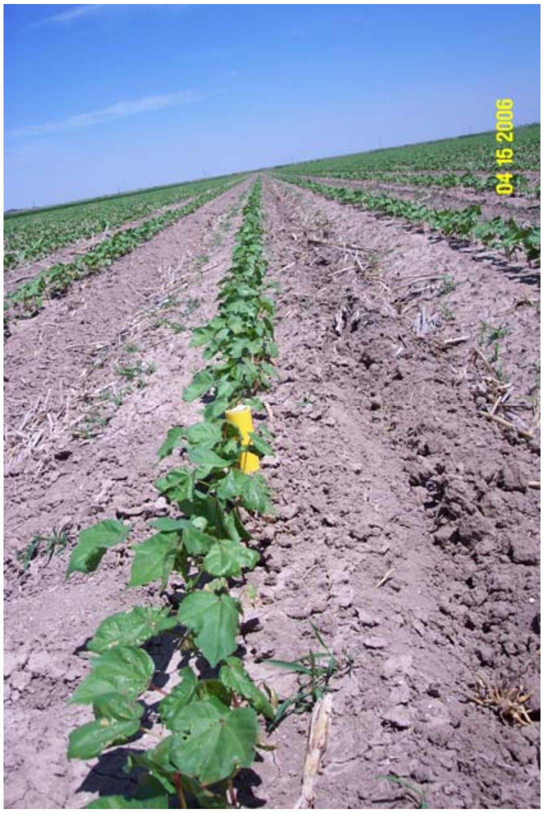
The surge valve offers many options when selecting the alternation intervals, but a problem arises when a section of the polypipe has been damaged. When the damaged section of polypipe is replaced with a sleeve of polypipe, it is very difficult to prevent the sleeve from slipping during repeated fill/drain cycles. The solution is to use a section of corrugated pipe as a splice and to tie the polypipe to this corrugated pipe.

Small elevation changes, restrictions in elbows, flowmeters, and the surge valve itself all contribute to significant reductions in the irrigation flow rate. These factors reduce the number of acres per hour that can be irrigated by as much as 50%, while still providing water conservation.

High moisture rates were maintained throughout the growing season within the 9” and 12” depths at all 4 sites never dipping below the 80% soil moisture level. Soil moisture levels at the 30” depth were very stable throughout the season.

31. Site # 42, Field 42B Spring 2006

Site Description:



The 95 acre field was planted in cotton. Surge irrigation technology was used with 21" polypipe. The soil type is Harlingen clay (HA).

Sensor Installation:

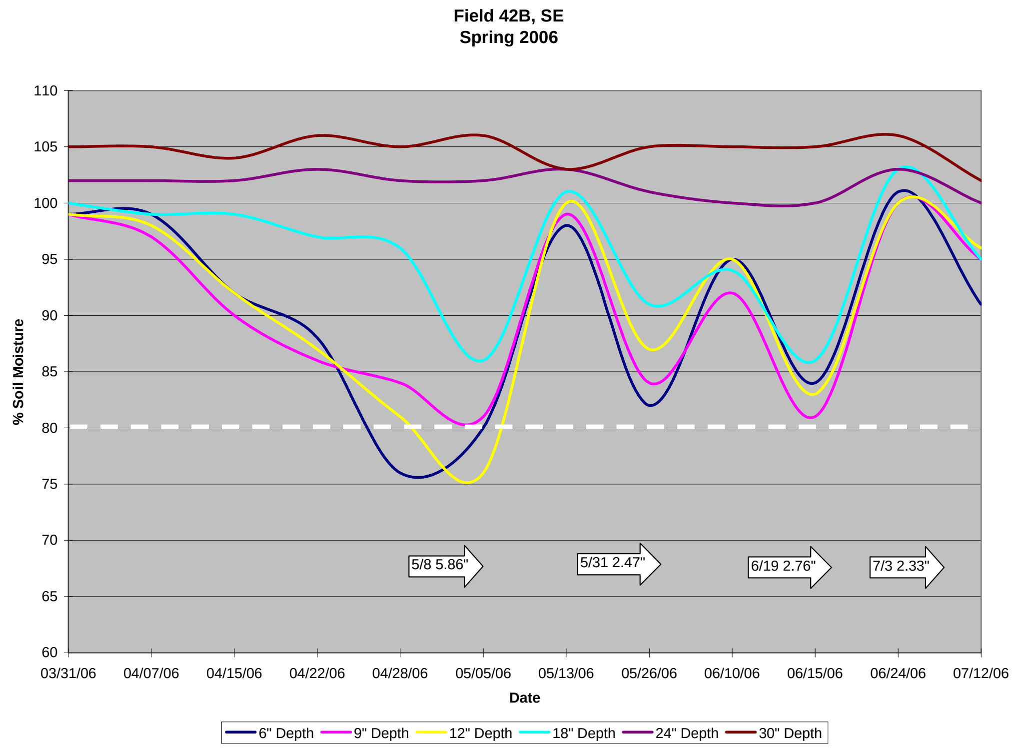
Three sensor sites were selected; the SE site was 50 rows in from the SE corner and 150' inside the field, the SW site was 250 rows from the SE corner and 600' inside the field, the NW site was located 175 rows from the NW corner and 150' inside the field. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 9", 12", 18", 24" and 30". A McCrometer flow meter was used to measure the amount of water applied.

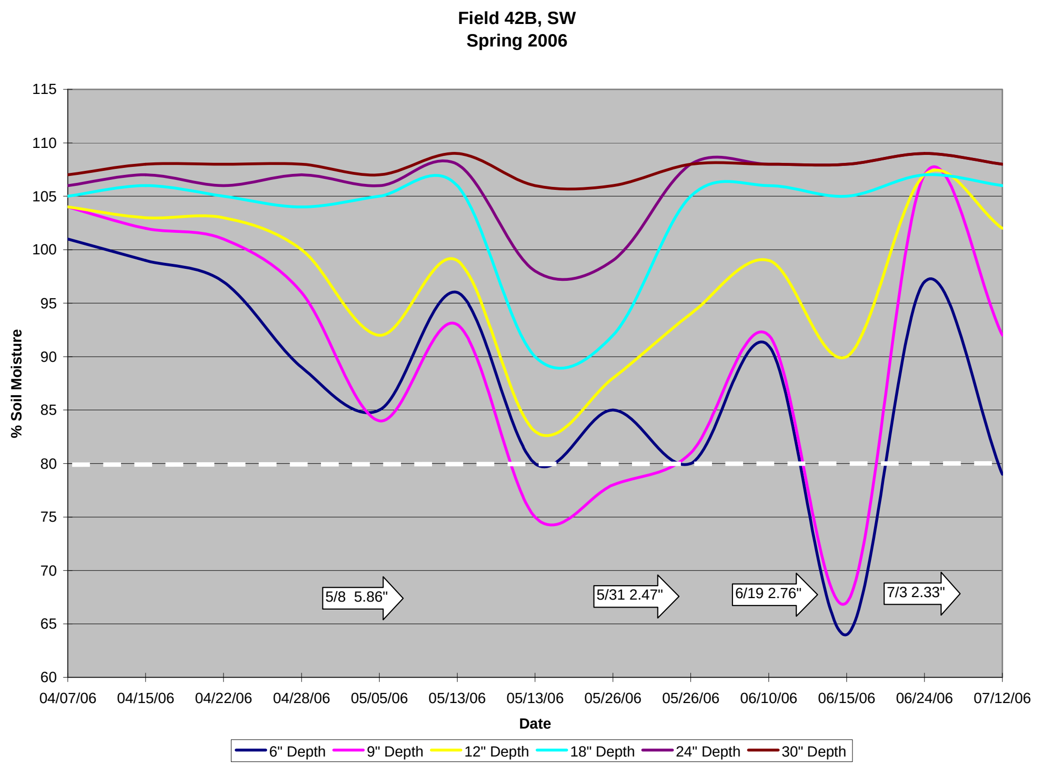
Irrigation Schedule:

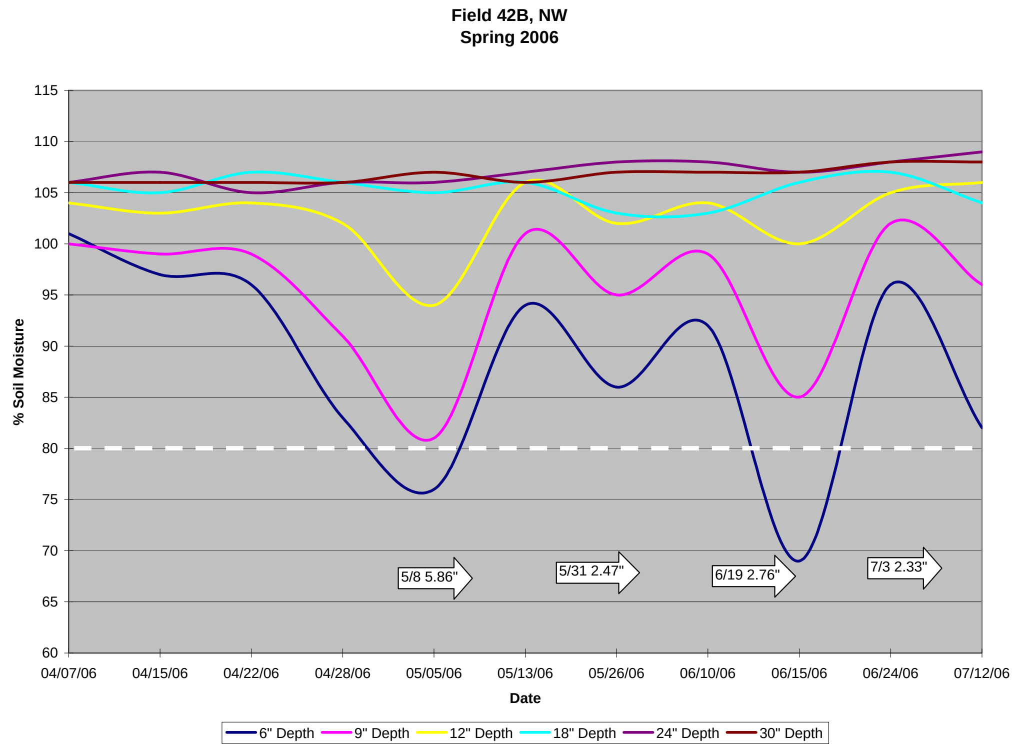
Date	Irrigation Method		Amount of Water Applied, per Acre
5/8	surge		5.86
5/31	surge		2.47
6/19	surge		2.76
7/3	flood		2.33
		Total	13.42"

Irrigation Method:

The entire field was irrigated with the surge technology. The SE chart shows a gradual decrease in the soil moisture from 3/31 through 5/5 with the 6", 9", and 12" lines trending downward together and the 18" line by itself until the 5/8 irrigation. After the first irrigation, the 6", 9", 12", and 18" lines begin to trend alike while the 24" and 30" lines remain stable throughout the entire season. It is interesting to note that the 24" and 30" lines change very little, perhaps due to no uptake by the plant roots due to saturation and/or compaction.


Field 42B, SE
Spring 2006
% Soil Moisture
110
105
100
95
90
85
80
75
70
65
60
5/8 5.86"
5/31 2.47"
6/19 2.76"
7/3 2.33"
03/31/06
04/07/06
04/15/06
04/22/06
04/28/06
05/05/06
05/13/06
05/26/06
06/10/06
06/15/06
06/24/06
07/12/06
Date
6" Depth
9" Depth
12" Depth
18" Depth
24" Depth
30" Depth


Field 42B, SW
Spring 2006
% Soil Moisture
115
110
105
100
95
90
85
80
75
70
65
60
5/8 5.86"
5/31 2.47"
6/19 2.76"
7/3 2.33"
04/07/06
04/15/06
04/22/06
04/28/06
05/05/06
05/13/06
05/13/06
05/26/06
05/26/06
06/10/06
06/15/06
06/24/06
07/12/06
Date
6" Depth
9" Depth
12" Depth
18" Depth
24" Depth
30" Depth



Observations:

High moisture rates were maintained throughout the growing season within the 9” and 12” depths at all 4 sites never dipping below the 80% soil moisture level. Soil moisture levels at the 30” depth were very stable throughout the season.

The SE chart shows a gradual decrease in the soil moisture from 3/31 through 5/5 with the 6”, 9”, and 12” lines trending downward together and the 18” line by itself until the 5/8 irrigation. After the first irrigation, the 6”, 9”, 12”, and 18” lines begin to trend alike while the 24” and 30” lines remain stable throughout the entire season. Perhaps these didn’t change due to no uptake by the plant roots because of saturation and/or compaction.

The SW chart shows a wide swing of moisture readings with the 6” and 9” dipping below the 80% mark around 6/15. All three sites show a spike at this same time, but the severity of the swing at this date is probably due more to cracking at the soil surface than a severe lack of moisture. The moisture levels at all depths, except 30”, are actively changing indicating good soil permeability.

The NW chart shows active moisture changes only at the 6”, 9”, and 12” depths. The soil type at this site is very heavy clay with the 18” – 30” zone fully saturated.

Economic Summary: Demonstration Sites 42A & 42B

The Demonstration Site 42 analysis consists of a 10-year financial outlook (2006-2015) for the 94 acres of cotton and 66 acres of grain sorghum production under surge irrigation with poly-pipe. It is assumed the cotton and grain sorghum acreage is rotated annually. The analysis assumes a $1,800 cost for a surge valve. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing cost. The initial cotton price is $.56/lb. and the grain sorghum price is $5.00/cwt., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates.

Total crop receipts for the 160 site average $575/acre initially and fluctuate from year-to-year as planted acreages rotate from cotton to grain sorghum production. Peak cash receipt years reflect those years where cotton plantings are the highest. In addition to market receipts, total receipts for the 160 acres include direct and counter-cyclical payments paid to base acres. Cash costs, including $48/acre irrigation costs for cotton and $49/acre for grain sorghum, also reflect the cotton to grain sorghum rotation cycle, requiring roughly $408/acre in the initial year and $350/acre in 2007. Net cash farm income (NCFI) generally follows the cotton to grain sorghum rotation cycle producing $167/acre profit in the initial year and averages $173/acre over the 10-year period. The risk associated with prices and yields suggests that, in a normal production year, NCFI could range as much as $88/acre to $100/acre plus or minus the average expected NCFI.

32. Site # 43, field 43A and 43B Spring 2006

Figure 1

Site Description:

The site is a 17 acre field (43A) planted in cotton and irrigated with Low Pressure Drip and a 39 acre field (43B) planted in cotton and furrow irrigated. The soil type is Harlingen Clay. Field slope is approximately .0005' from the North and .0003' to the East.

Sensor Installation:

One Furrow with a sensor site located 250' from the upper end and another sensor site located 250' from the lower end. Each sensor site utilized 4 watermark soil moisture sensors connected to a Watchdog Data logger for data storage/retrieval. The data loggers were set to record soil moisture readings every 15 minutes. Two sensors were placed 18" deep along the outside shoulders of each bed away from the furrow where the drip tape was buried. The remaining two sensors were located 12" deep along the shoulder of the beds facing the drip tape.

Irrigation Schedule:

LPS DRIP, Field 43A

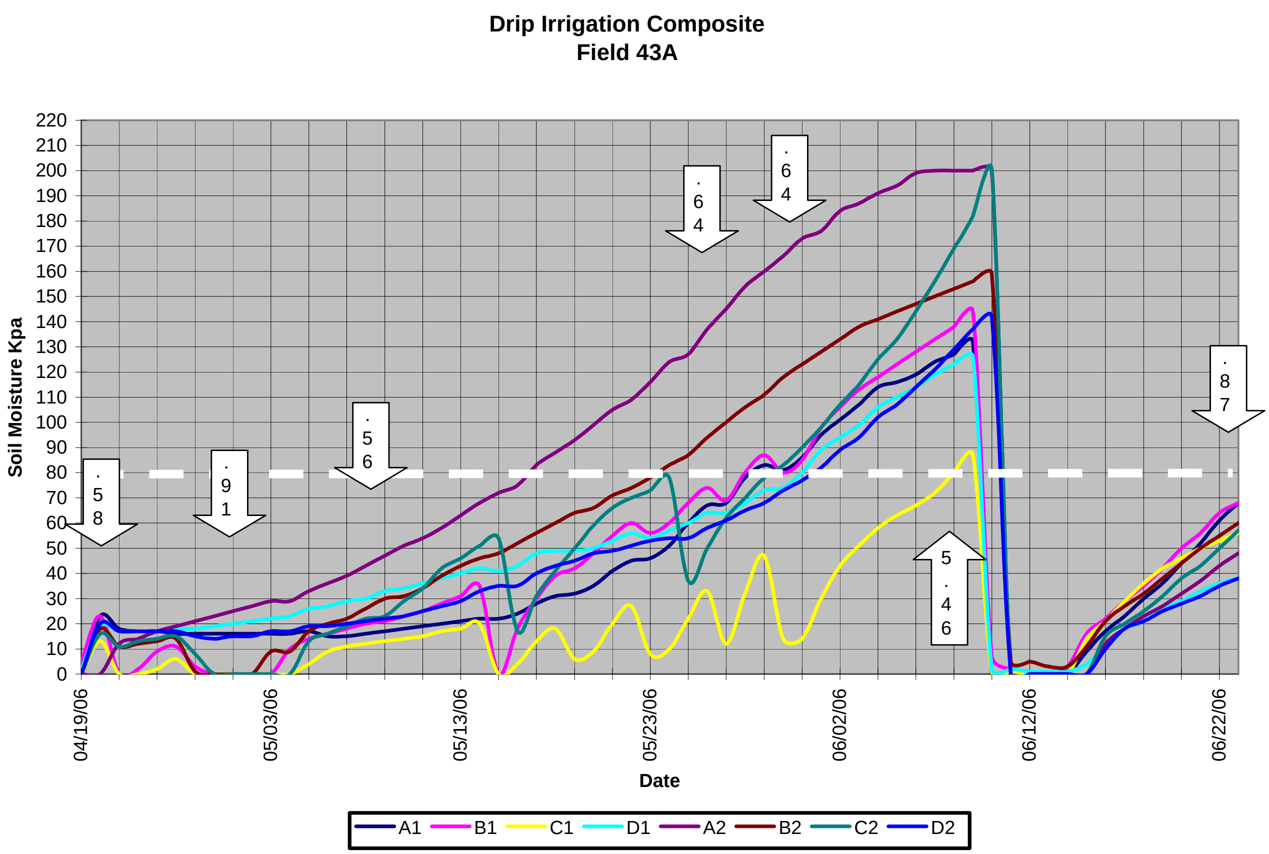
Date	Method		Water Applied
4/20	Drip		.58
4/28	Drip		.91
5/8	Drip		.56
5/26	Drip		.64
5/30	Drip		.64
6/9	Furrow		5.46
6/26	Drip		.87
		Total	**9.66 in**
		Rainfall	**9.29 in**
		Total	**18.95**

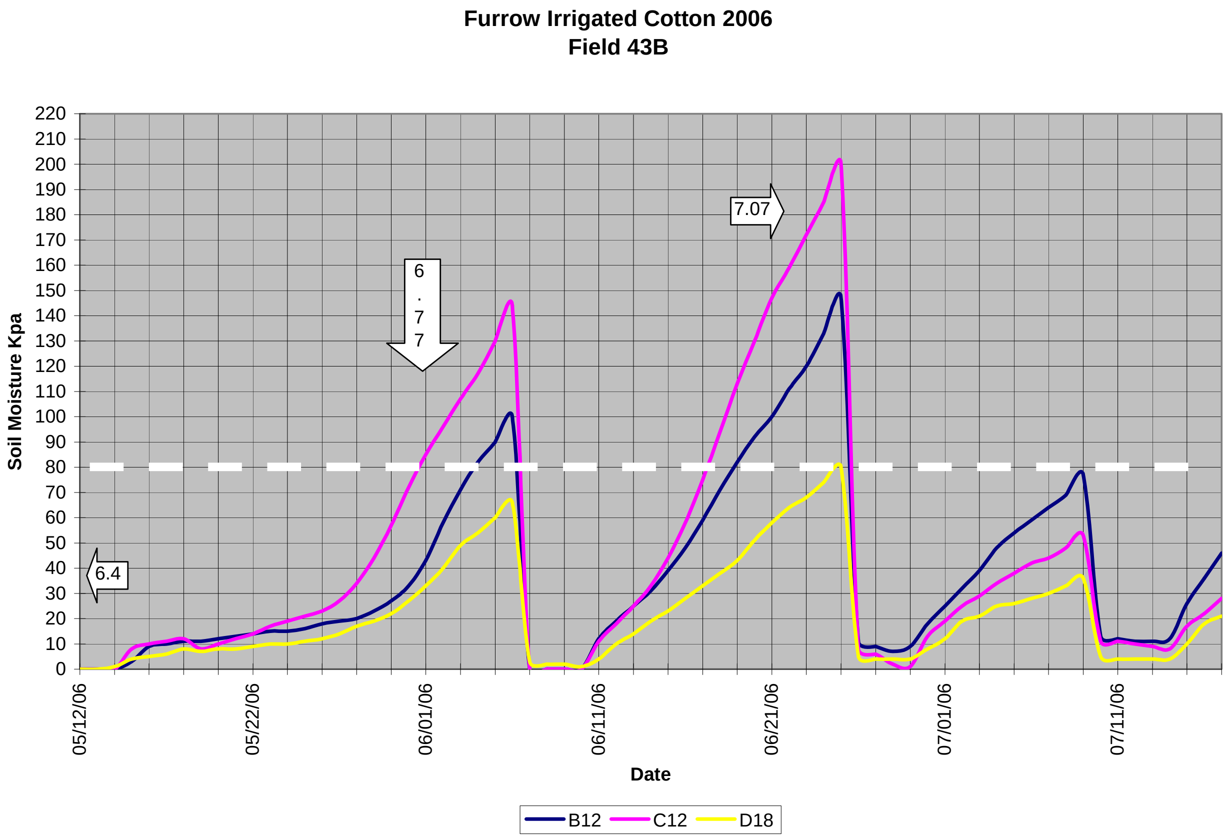
FURROW, Field 43B

Date		Water Applied
5/4		6.4
6/1		6.77
6/22		7.07
	Total	**20.24 in**
	Rainfall	**9.29 in**
		29.53

Irrigation Method:

The Low Pressure Drip (LPS) irrigation system is designed to operate with a head pressure of 3 p.s.i. This system was initially operated with gravity flow at approximately 1.5 – 2 p.s.i., but was later pressurized to 3.5 p.s.i. The drip tape was placed approximately 3" deep in every other furrow. The row spacing was 40", thus the drip tape spacing was 80" and the row length is 1260'.





Observations:

As the charts illustrate, the water supply did not satisfy the water demand until a flood irrigation was applied. The gravity head pressure wasn't supplying an adequate flow rate and there was a delay caused by pump problems. Additionally, the LPS 8 mil tape plugged with algae while the pump motor was being repaired.
However, the tape was able to be cleaned and performed well for the rest of the season.
The irrigation technology allows the grower to apply small amounts of water as needed, but requires careful attention to establish and maintain an adequate amount of available water.
The LPS system applied 52% less (9.66 ac-in) water than the furrow irrigated (20.24 ac-in).

Economic Summary: Demonstration Sites 43A & 43B

The Demonstration Site 43A and 43B analysis consists of a 10-year financial outlook (2006-2015) for the 38 acres of furrow with poly-pipe and 17 acres of drip cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.56/lb., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates. The drip system costs on average $143/acre/year.

Total cash receipts average about $590/acre acre for both irrigation methods. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Due primarily to the required replacement of drip tape every two years, cash costs, including irrigation costs, average $530/acre acre for the drip compared to $400/acre for the furrow irrigation. Peak cash cost years occur in years where drip tape is replaced. Net cash farm income (NCFI) for the furrow plot averages $190/acre, over three times higher than $60/acre for the drip plot. The risk associated with prices and yields suggests that, in a normal production year, NCFI could range as much as $132/acre plus or minus the average expected NCFI for the furrow site. However, for the drip site, NCFI is projected to be highly volatile with a higher probability of being negative.

33. Site # 44, field 44A Spring 2006

Site Description:

The site is a 38 acre field which was planted in cotton. The irrigation method is furrow irrigation with surge valve technology and the soil type is mainly Harlingen Clay. Field slope is approximately .0005’ from the North and .00025’ to the East.

Sensor Installation:

One furrow was selected with sensor sites 100’ in from the upper end, in the middle of the field, and 100’ in from the lower end. One Aqua-Pro sensor tube was installed at each of the three sites. A tipping bucket rain gauge with data logger was located approximately ½ mile from the field.

Irrigation Schedule:

Date	Amount of Water Applied
3/6	6.32
March rainfall	.87
April rainfall	.66
May rainfall	2.38
6/1	4.52
6/21	2.72
June rainfall	1.12
July rainfall	4.26
Total	**22.85”**

Irrigation Method:

The surge valve is located in the center of the field and the field is divided into two settings on each side of the surge valve. The surge valve was programmed to irrigate one section per side during a 24-hour period. During this 24-hour setting there were six alternations per side based on a variable time scale. The surge controller requires the operator to enter the initial setting time period and then calculates the remainder of the settings. Our initial setting time was 30 minutes. The entire field was irrigated in 48 hours.

Observations:

The initial irrigation in March was flood, not surge, and the numbers tell the story in that the 6.32 ac-in application was the largest single application during the season. The surge technology allowed the grower to apply less water per irrigation.

Economic Summary: Demonstration Site 44A

The Demonstration Site 44A analysis consists of a 10-year financial outlook (2006-2015) for the 38 acres of cotton production under surge irrigation with poly-pipe. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.529/lb., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a surge valve at a cost of $2,200. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

Total cash receipts average $592/acre over the 10-year period and cash costs average just under $457/acre, including $40/acre variable irrigation costs. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Net cash farm income (NCFI) increases throughout the 10-year period from $76/acre in 2006 to $169/acre in 2015. The risks associated with prices and yields suggest some chances of negative NCFI. In a normal production year, NCFI could range as much as $158/acre plus or minus the average expected NCFI for the site.

34. Site # 45, field 45A 2006

Site Description:

The site is a 36.7 acre field in first year Sugar Cane. The irrigation technology is furrow irrigation with poly-pipe and the soil type is Harlingen Clay. Field slope is approximately .0005' from the North and .0003' to the East.

Sensor Installation:

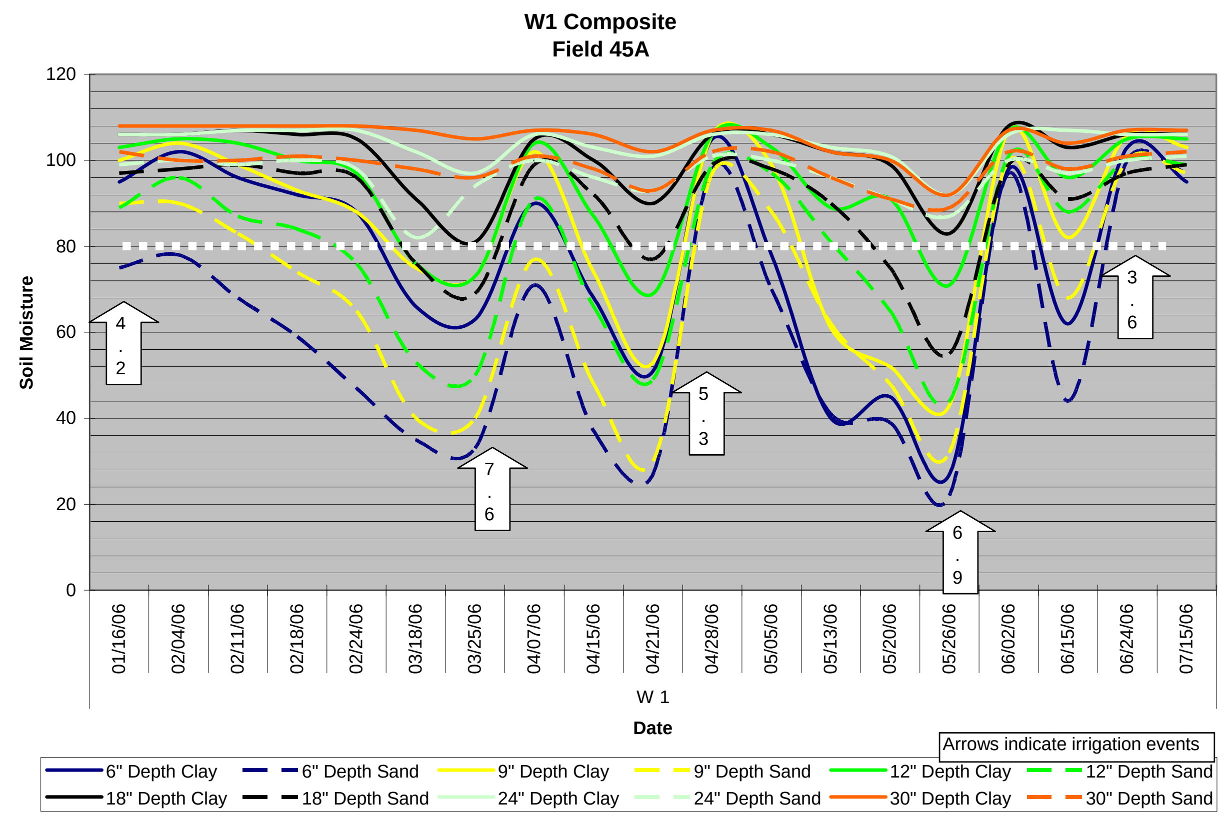
Two rows were chosen with three sensor sites per row. The East row was the 25th row counting from the east side of the field and the West row is also the 25th row counting from the west corner. The #3 sensor sites were located 100' down the row, the #2 sensor sites were located 600' down the row (starting from the north end), and the #1 sensor sites were located 100' down the row (measured from the south end). Two Aqua-Pro sensor tubes were installed at each site. The tubes labeled clay was installed with a slurry made from the topsoil and the tubes labeled sand were installed with a slurry made from a sandy loam topsoil. A Watchdog data logger with three watermark soil moisture sensors buried at 1', 2', and 3' depths was also placed at sensor site E1. Three Echo probe sensors with a Decagon Data logger were installed at sensor site E1 at 1', 2', and 3' depths.
McCrometer insertion-type flow meters were mounted into the two field turnouts to measure the amount of water applied. One tipping-bucket rain gauge with a Watchdog data logger was used to measure rainfall events.

Irrigation Schedule:

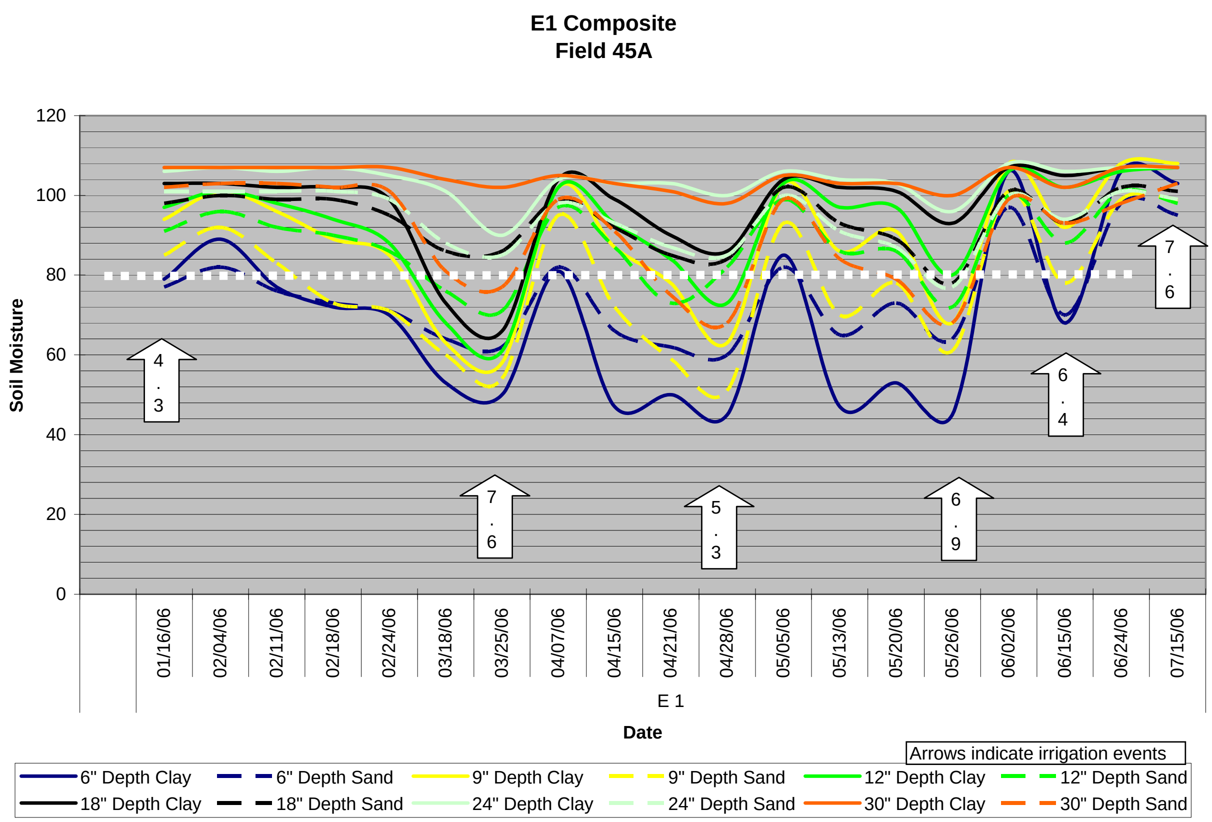
Date	Amount of water applied ac-in.
10/3	4.9
11/22	3.99
1/17	4.27
3/28	7.59
4/29	5.28
6/1	6.98
6/20	6.43
7/14	3.63
7/24	7.85
8/5	8.16
Total	**59.08 ac-in.**

Irrigation Method:

The field was furrow irrigated using 18" polypipe with size "A" holes from two field turnouts. One turnout is located at the NW corner and the other is along the NE side. Although a flume was installed to measure tail water, there was no measurable loss.



W1 Composite
Field 45A
Soil Moisture
120
100
80
60
40
20
0
4.2
7.6
5.3
6.9
3.6
01/16/06
02/04/06
02/11/06
02/18/06
02/24/06
03/18/06
03/25/06
04/07/06
04/15/06
04/21/06
04/28/06
05/05/06
05/13/06
05/20/06
05/26/06
06/02/06
06/15/06
06/24/06
07/15/06
W 1
Date
Arrows indicate irrigation events
6" Depth Clay
6" Depth Sand
9" Depth Clay
9" Depth Sand
12" Depth Clay
12" Depth Sand
18" Depth Clay
18" Depth Sand
24" Depth Clay
24" Depth Sand
30" Depth Clay
30" Depth Sand



E1 Composite
Field 45A
Soil Moisture
120
100
80
60
40
20
0
4.3
7.6
5.3
6.9
6.4
7.6
01/16/06
02/04/06
02/11/06
02/18/06
02/24/06
03/18/06
03/25/06
04/07/06
04/15/06
04/21/06
04/28/06
05/05/06
05/13/06
05/20/06
05/26/06
06/02/06
06/15/06
06/24/06
07/15/06
E 1
Date
Arrows indicate irrigation events
6" Depth Clay
6" Depth Sand
9" Depth Clay
9" Depth Sand
12" Depth Clay
12" Depth Sand
18" Depth Clay
18" Depth Sand
24" Depth Clay
24" Depth Sand
30" Depth Clay
30" Depth Sand

Observations:

The attached charts illustrate the soil moisture, expressed as a percentage of moisture available, variations over time. The charts show a conservative use of irrigation water with the available moisture readings, at the depths of 12” and greater, staying above 70% except for a two-week period during March. The center of the field (E2, and W2) was drier than the ends. The Aqua-Pro sensor and buried tubes perform well, allowing the user to monitor the available soil moisture at various depths from the surface to 30”. The soil develops substantial cracks during the wetting and drying cycles. It is these surface cracks which cause the 6” depth readings to fluctuate more than any other. The sensor tubes installed with the clay slurry were more prone to surface cracks than the tubes installed with the sandy loam slurry. However, there were roots which followed the sandy loam slurry which caused the larger soil moisture fluctuations at the 24” and 30” depths. The Watermark sensors and Watchdog data logger performed well and offered the advantage of continuously recording measurements on 15 minute intervals. The Decagon data logger and Echo probes also performed well and offer the same benefit of continuous recording.

Economic Summary: Demonstration Site 45

The Demonstration Site 45 analysis consists of a 10-year financial outlook (2006-2015) for the 38 acres of sugarcane production under furrow irrigation with poly-pipe. The initial outright purchase of sugarcane grinding rights ($800/acre) with no financing is included. The baseline scenario produces a negative cash position the first two years, but no interest was charged on carryover balances. For the 10-year outlook projection, the sugarcane price is based on the producer’s estimate of future prices and is held at an average of $17 per ton. 2006 production costs and overhead charges are producer estimated rates.

Total cash receipts average just over $849/acre initially and decline as the productive capacity of the sugarcane diminishes until the sixth year when the land is idle. Cash costs, including $56/acre in variable irrigation costs, also reflect the sugarcane production cycle, requiring roughly $555/acre in the initial year, about one-half that amount in subsequent years and approximately $130/acre in the idle year. Average net cash farm income (NCFI) generally follows the sugarcane production cycle producing $294/acre profit in the initial year and peaking at $456/acre the second year. It averages approximately $255/acre per year for the assumed 6-year sugarcane cycle. The risk associated with prices and yields suggests that, in a normal production year, NCFI could range as much as $184/acre to $211/acre plus or minus the average expected NCFI.

35. Site# 47, field 47A and 47B Spring 2006

Site Description:

The 39 acre field was planted in corn and is divided into two sections, 47A is the eastern part of the field with 20 acres and 47B is the western part of the same field with 19 acres. The soil type is Raymondville clay loam. Surge irrigation technology was used for field 47B and flood irrigation was used for field 47A. The eastern part, 47A, has a slope of .00005’ and the western part 47A has a slope of .0001’.

Sensor Installation:

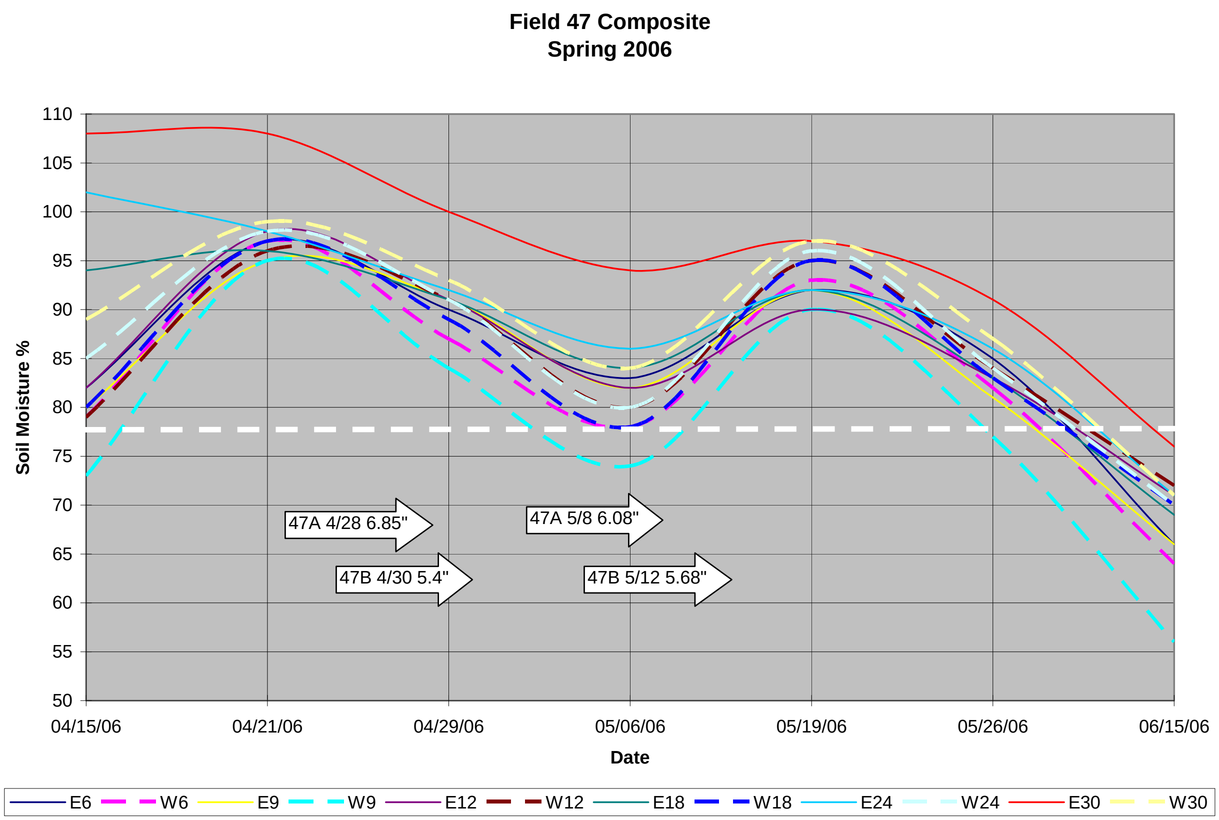
Two furrows, one East and one West which were 50 rows from the edge, were selected with sensor sites located 200’ from the lower end. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6”, 9”, 12”, 18”, 24” and 30”. A McCrometer flow meter was used to measure the amount of water applied.

Irrigation Schedule:

Date	Field	Irrigation Technology	Water Applied per Acre
4/28	47A	flooded furrow	6.85
4/30	47B	surge	5.4
5/8	47A	flooded furrow	6.08
5/12	47B	surge	5.68
Total	47A	flooded furrow	12.93”
Total	47B	surge	11.08”

Irrigation Method:

The surge controller was programmed to complete the irrigation cycle in 24 hours with the first alternation to occur at the 5 hour interval. The cooperator used 18” diameter polypipe on both fields. The surge controller was programmed to alternate 6 cycles in a 24-hour period.



Observations:

The surge technology did not deliver substantial savings in the amount of water applied. The curves show that the soil moisture lasted longer with the flooded furrows than with the surge irrigation. Since the Raymondville clay loam is much more permeable than the Harlingen clay, it is possible that the steeper slope of the surge field lessened the opportunity time for deeper percolation of the irrigation water when compared to the flatter part of the field. The cooperator liked the surge technology well enough to use it again for the following spring, noting better uniformity and moisture retention than what he had experienced in the past with flooded furrow irrigation.

Economic Summary:

Economic summary for this site has not been completed.

Appendix E

Flow Meter Calibration Facility

Table of Contents

Foundation and Building

The construction of the Flow Meter Calibration Facility began in April of 2006. The contract for the foundation labor was issued to Joe Farias and materials were the responsibility of Harlingen Irrigation District. The form work was completed in accordance with the Engineers design in late April. Due to the nature of the pours the

District hired L&G Concrete to pump one hundred and seventy two yards of concrete for the foundation. The foundation was poured in three parts and this began the first part of May 2006.

The design called for a 60’ x 100’ x 12’ open sided building. After reviewing several bids the District purchased the building from Muller Buildings Inc in April of 2006. The building was delivered in May and the District hired AAA crane service to erect the building. Erecting began mid May 2006 and was completed in two weeks.

Office and Meeting Room

Upon completion of the shell erection, District personnel began construction of the 20’ x 40’ office and meeting room facilities. This facility consists of a 20x30 meeting room with one restroom and an office /control room. Electrical and plumbing work was

Meeting Room

Office/Control Room

contracted to Parish Electrical and Plumbing. The District hired two local building tradesmen to finish the interior of the office as well as lay the tile floor. All building construction was done in compliance with the building codes of Cameron County Texas. The construction was inspected on a regular basis by Cameron County building Inspectors as well as Texas Water Development board inspector Juan Bujanos. The foundation, building and office facilities were completed in November of 2006.

Water Conveyance System

The District began construction of the water conveyance portion of the Flow Meter Calibration Facility in June of 2006 with the construction of the water diversion box. This box is used to divert the water pumped from the inlet channel to three pipelines. One feeds the open channel flume, one feeds the closed pipe manifold and one feeds the discharge to the main canal. The diversion box is constructed of a twelve inch foundation with a four foot wall topped with two nine feet by 7 feet concrete boxes. The box is divided by a sixteen foot head wall to provide a constant head to the facility. The over flow from the headwall is diverted back to the inlet channel. The diversion is controlled by three twenty-four inch slide gates in the diversion box.

Completed Diversion Box

Diversion Box Foundation

Setting the Concrete Boxes

Open Channel Flume

Upon completion of the diversion box work began on the open channel flume. This flume is designed to demonstrate and calibrate open channel water measurement devices. The flume is three feet wide by four feet deep and one hundred and forty feet long. The fall from high end to low end is .083 inches per foot. It is divided into ten foot sections by two inch aluminum channels imbedded in the concrete wall allowing for the placement of control gates and check structures. The flume discharges into the inlet channel allowing for recirculation of water. There are also four, eight inch discharge pipes placed along the outside of the flume for canal turn out simulation.

Flume inlet with Sharp Crested Weir

Flume Discharge with Broad Crested Ramp

Water flowing over Sharp Crested Weir at a rate of 6.5cfs

Water over Broad Crested Ramp at a rate of 6.5 cfs

Closed Pipe Manifold

The closed pipe manifold was designed to calibrate insertion type meters for pipe sizes ranging from twenty-four inches to six inches in diameter. The manifold was built by Morrill Industries and assembled by District personnel. At the inlet of the manifold are two Siemens certified 6000 Mag flow meters. A twenty-four inch meter for high flows and a twelve inch meter for low flows. The manifold is designed to allow for inter-changeable pipe diameters and many flow meter configurations.

Calibration Tank

In addition to the Mag Meters the District has constructed a calibration tank to measure the flow of water volume over time. Water can be diverted from the open channel flume as well as the closed pipe manifold into the tank for a more precise flow measurement. The tank is built on a twelve inch thick one hundred and forty four square foot foundation topped with two ten by ten concrete boxes and a four foot poured concrete wall. The tank has a fifteen inch discharge that is controlled by an air operated flush valve.

Calibration tank and discharge/flume foundation /drain pipe.

Calibration tank 15" discharge pipe.

Calibration tank poured wall and flume end.

Manifold discharge and calibration tank

Catwalk and Viewing Platform

For easier access and viewing of the demonstration area the District constructed a catwalk and viewing platform. This structure allows for the mounting of electrical conduit and data cable conduit as well as access to both sides of the flume and pipe manifold.

Control and Automation

The District has purchased a rack mounted pc for control and automation of the Flow Meter Calibration Facility. The pc and related software will allow the facility operators to control and demonstrate many methods of total canal automation and control as well as perform calibration on meters. The system consists of the rack mounted pc, one SCADA system for data acquisition and control, a 48 to 24 channel patch panel to route data in and out of the control room and a wireless interface for communication with external devices such as laptop computers. The installation and programming of this system as well as installation of flow measurement devices is the majority of the work left to complete at the facility. We expect to have this work completed in May of this year.

The District has solicited many flow measurement device manufactures for donations of devices for demonstration and automation of the facility. To date we have received positive responses from Rubicon Systems America, Siemens, Sontec and Seametrics. Over the next several months the District will be working with these companies to install their devices for demonstration and evaluation purposes as well as aids in the automation of the facility. We have also begun contacting all the irrigation districts in the Rio Grande Valley to survey the needs of the individual districts to better prepare for the type of meters we will calibrating.

Use of Facilities

Since the completion of the meeting room facilities in November, the District has had the opportunity to host several workshops and grower information meetings. In December of 2006 the District hosted a USDA-NRCS EQIP information meeting. This meeting was well attended by growers and agency personnel alike. Also in December we held an ADI managers meeting to discuss data collection and the building of the irrigation information database.

In February the District in conjunction with Cameron County Extension, Texas A&M Extension and USDA-NRCS held its second water management workshop at the new Flow Meter Calibration Facility meeting room. The workshop was attended by approximately 20 growers and agency personnel. We have planned another Water Management workshop for May 2007.

Enrigue Perez , Cameron County Extension Agent, addressing the attendees of the Water Management Workshop

Annual Progress Report for 2006

March 1, 2006 through February 28, 2007

for Work Under

Maximization of On-Farm Surface
Water Use Efficiency by Integration of On-Farm
Application and District Delivery Systems

Texas Water Development Board
Agricultural Water Conservation
Demonstration Initiative Grant

Submitted to:

Harlingen Irrigation District
Cameron County No. 1
Harlingen, Texas

February 28, 2007

AXIOM-BLAIR
ENGINEERING

P.O. Box 150069
Austin, Texas 78715
www.axiomblair.com

Table of Contents

LIST OF TABLES

1. Introduction and Overview

This report contains the annual progress report for the Agricultural Demonstration Initiative Project as indicated in the Scope of Work contained in the contract between Harlingen Irrigation District – Cameron County No. 1 (HIDCC1 or the District) and Axiom-Blair Engineering, L.P. (ABE). A description of the overall progress, description of any problems encountered that have any effect on the study, delay of the timely completion of work or change in the deliverables or objectives of the contract are discussed, as well as any corrective actions necessary.

During the year 2006, ABE was tasked to provide the following general support to the project:

- Subcontracting Contract Execution: The Subcontractor will assist the District in preparing and executing the subcontracts with Delta Lake Irrigation District, Texas A&M University Kingsville, and others to provide support and services to the District on the primary contract.
- District and On-Farm Flow Meter Calibration and Demonstration Facility: The Subcontractor will provide civil engineering services to: 1) diagram the flow meter pipe and placement layout; 2) diagram the test canal configuration depicting weir and test gate locations and layout; and 3) PLC programming; and 4) other technical support as necessary to conclude the design and implementation of the facility.
- Demonstration of Internet Based Information Real-Time Flow, Weather, and Water User Accounting System: The Subcontractor will assist the District in finalizing the development of the real-time flow, weather, and water user information system (RTIS), with computer programming services to extend the current SCADA software to display flow rate and other information from the District's secondary On-farm flow measurement telemetry system, and incorporate portions of the existing water use accounting system into the internet display application. The Subcontractor will also develop new RTIS software to collect real-time rainfall measurements at five telemetry sites along with software to collect weather station information at two of those sites, for display within the current Internet display application. The two weather station sites will be incorporated into two of the existing primary telemetry sites. The District shall make the District's water user accounting system and any programming consultant for the system available to the Subcontractor and such programming consultant may be retained by the Subcontractor for the purposes of providing the necessary software interface between the water user accounting system and the RTIS. The Subcontractor will assist the District in documenting the features and capabilities of the RTIS.

- Technical Support: The Subcontractor will provide engineering and other technical support to the District, as directed, regarding efforts to sustain the primary contract task or support other subcontract activities.
- Variable Speed Pump Control and Optimization of Delivery of On-Farm Demands: The Subcontractor will provide assistance to Delta Lake Irrigation District (DLID) in the design, implementation, and purchase of the pump controller/PLC to use with DLID pump equipment to demonstrate the use of internal combustion engines in matching the quantity of water diverted from the district canal for meeting irrigation demands. A technical workshop and the associated training materials will be prepared for training district managers in the proper design, installation, and cost of installing and operating variable speed drives, and the associated pumping and pipeline systems.

The following sections address the specific Scope of Work between the District and ABE, and the work completed on each task during March 2006 through February 2007.

2. Scope of Work

The Task Descriptions and work provided for each Task is discussed below.

2.1 Subcontracting Contract Execution

2.1.1 Task 1 Description

The Subcontractor will assist the District in preparing and executing the subcontracts with Delta Lake Irrigation District, Texas A&M University Kingsville, Texas Cooperative Extension, and others to provide support and services to perform the work task.

2.1.2 Work Completed

The subcontracts for Delta Lake Irrigation District, Texas A & M University Kingsville, Texas Cooperative Extension, and others were completed. Contract modification work requested by TWDB has been completed.

2.2 District and On-Farm Flow Meter and Demonstration Facilities

2.2.1 Task 2 Description

The Subcontractor will provide civil engineering services for the design of the facilities, including but not limited to preparing site plan drawings, pump and piping system layout, open channel flow measurement system, pump and remote control specifications, construction bid and contracting documents, and preparation of environmental summary reports for submittal by the District to Texas Historical Commission, Texas Parks and Wildlife Department, and the US Army Corps of Engineers.

2.2.2 Work Completed

A Flow Meter Calibration and Demonstration Facility was constructed in 2006 and early 2007. The primary work in 2006 consisted of site review of construction, design and bidding of the flow meter manifold system, and design of the SCADA control system. Engineering drawings for the manifold system are available from the district.

The remaining design work for the Calibration Facility includes flow meter pipe The only engineering work remaining for the Calibration Facility consists of wiring in the SCADA control system and development, installation of the automatic gate and variable speed motor controllers, and software development for the control system

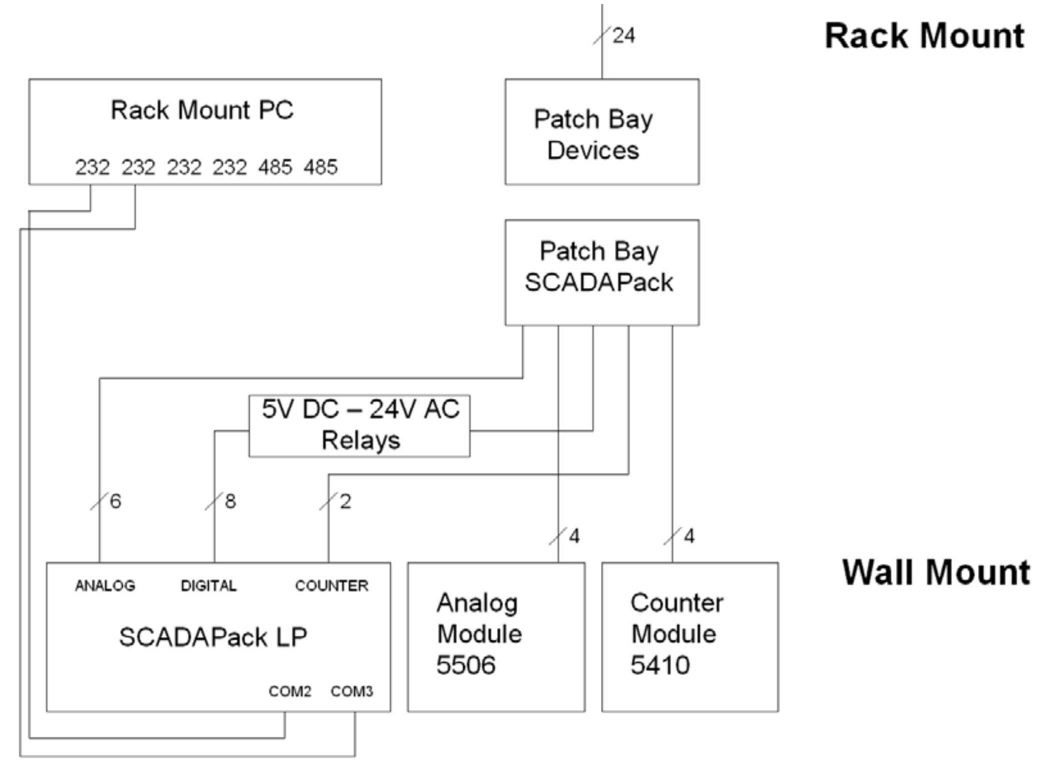


Figure 1 – Block Diagram of Flow Meter Calibration Facilty SCADA System

. Figure 2 – Flow Measurement Manifold System

2.3 Demonstration of Internet Based Information and Real-Time Flow, Weather and Water User Information (RTIS)

2.3.1 Task 3 Description

The Subcontractor shall assist the District in developing the real-time flow, weather, and water user information system (RTIS), including computer programming services such as those necessary to develop the software to display specific District information from the District's existing flow measurement telemetry system and existing water use accounting system on the internet. The Subcontractor shall develop the necessary software to collect real-time rainfall data from five locations selected by the district and co-located at existing flow measurement telemetry nodes and display such rainfall data on the District's web site. The Subcontractor will assist the District in preparing a document that defines the features and capabilities of the RTIS, and the Subcontractor shall use this document in developing the RTIS software. The Subcontractor shall make use of the District's water user accounting system and any programming consultant for the system and such programming consultant shall be retained by the Subcontractor for the purposes of providing the necessary software interface between the water user accounting system and the RTIS.

2.3.2 Work Completed

The initial phase consisted of development of a general website for HIDCC. This task was completed on August 15, 2005. The second phase consists of developing the computer programming necessary to display flow measurement data from HIDCC telemetry server in real-time over the Internet. This phase was completed in November of 2005 and the system is operational. Additional meters and rain gauges are being added to the web display system as such devices become operational.

The third phase consists of development of software for secure access to on-farm flow meter records, water use charges, and water billing by interfacing the Internet server with the District's existing accounting system computer. The District water accounting software is being updated by a third-party at the District's expense, and this software update needs to be completed before significant progress can be made in this phase. Initial work on this phase addresses the accounting and water ticket database fields related to user information such as property identification, crops, requested water amounts, times, etc.

The following is an initial release of the information that outlines the features and uses of the Internet accessed real-time flow, weather, and water user information system (RTIS). The following details how to locate and use the RTIS website, and how to select a pumphouse and water deliveries to view as an example of navigating the website. The source code for this part of the RTIS software system is attached as Appendix F.

2.3.2.1 HID Internet Website RTIS Reporting User Guide – Part I

Welcome to the Harlingen Irrigation District Agricultural Water Conservation Demonstration Initiative Internet Based Information project! This documentation outlines the features of the Internet accessed Real-Time flow, weather and water user Information System (RTIS) and how to use it. The web interface to the system is available on the district's website, which is located at http://www.hidcc1.org. After navigating to the district website, select Telemetry as shown below in Figure 2.1.

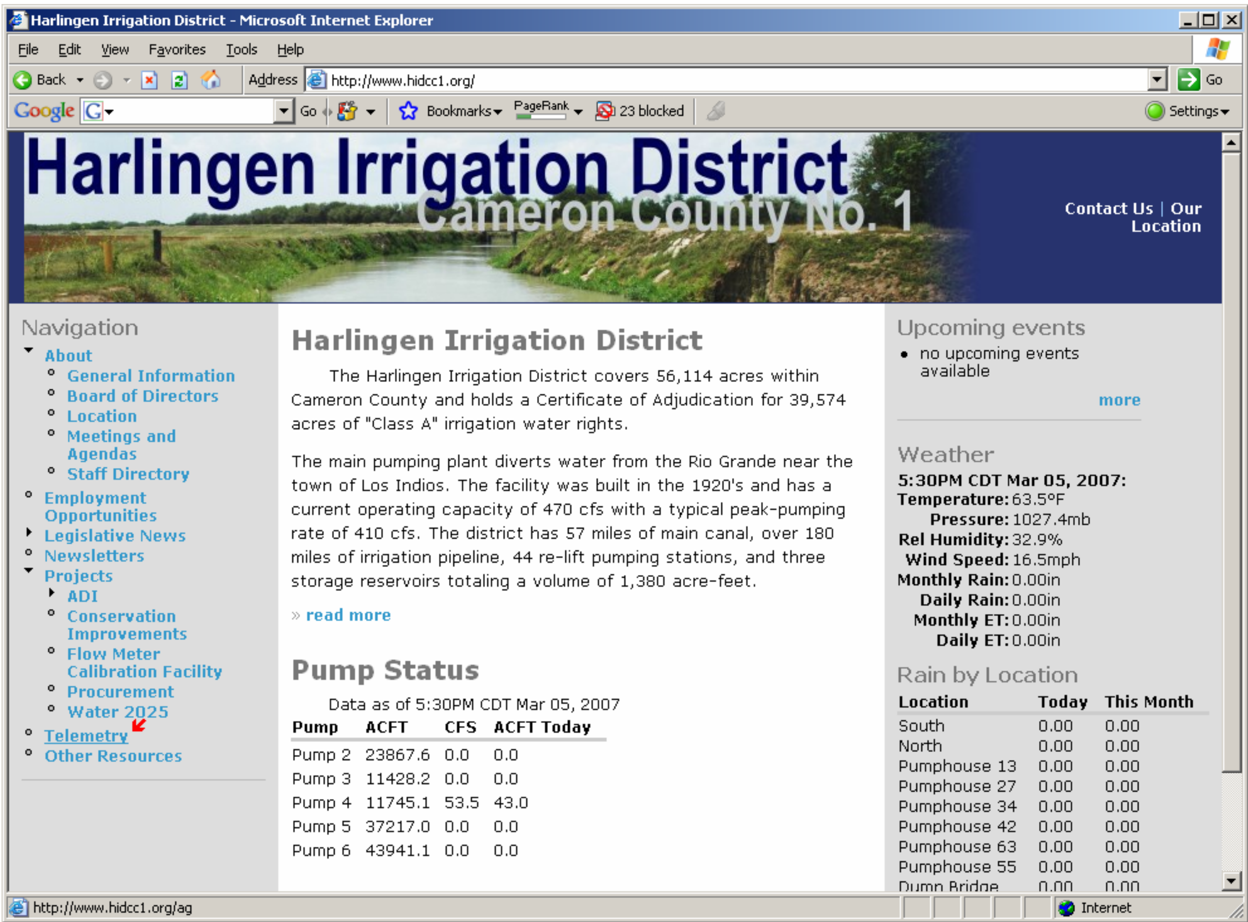


Figure 2.3.2.1.1: Harlingen Irrigation District Web Site Main Screen

Now at the Telemetry Main Page, you are shown a list of site groups which may be expanded to reveal sites and data points.

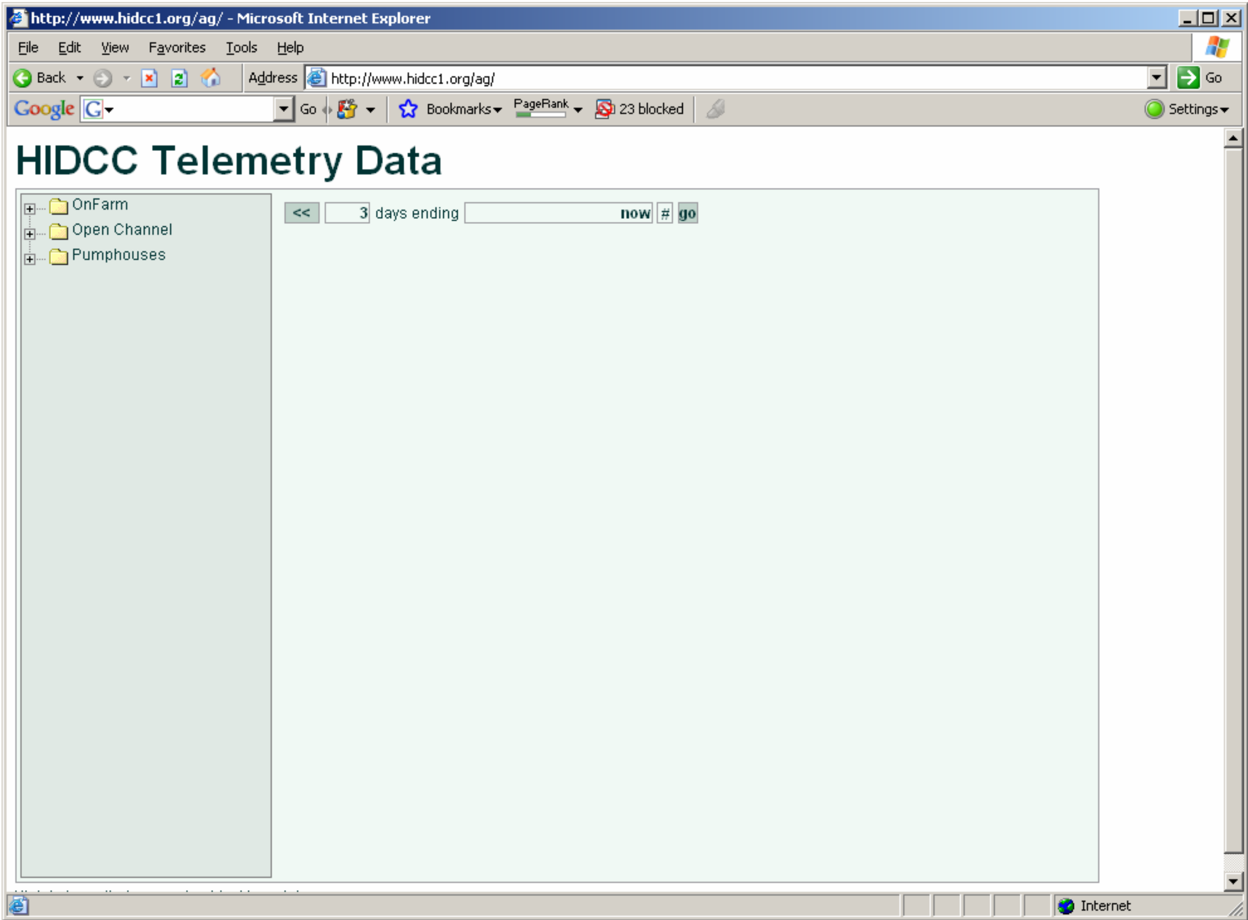


Figure 2.3.2.1.2: Telemetry Main Page

Once at the Telemetry Main Page, you may expand the desired section by clicking the Plus sign (+) to the left of the folder you wish to examine, then select a specific site by clicking on that site's text label or expand the site to display a single graph from the site.

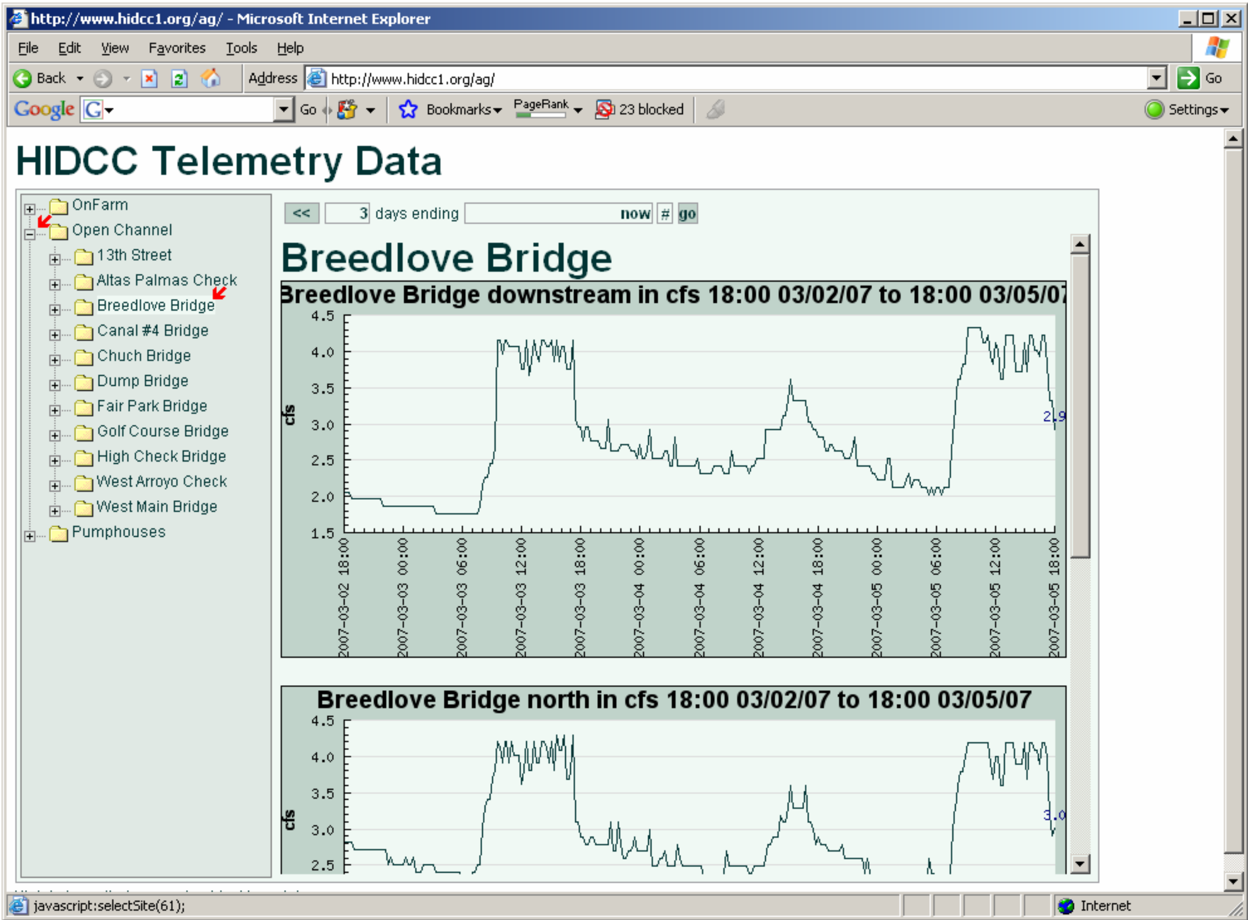


Figure 2.3.2.1.3: Telemetry Data Display

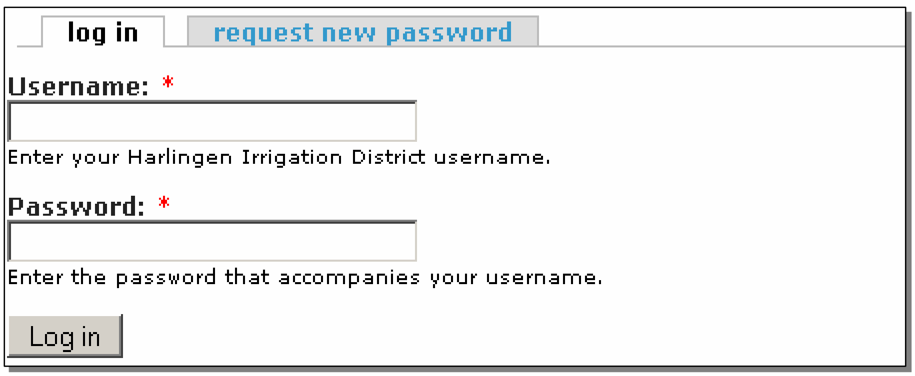
2.3.2.2 Website CMS (Content Management System)

2.3.2.2.1 System Overview

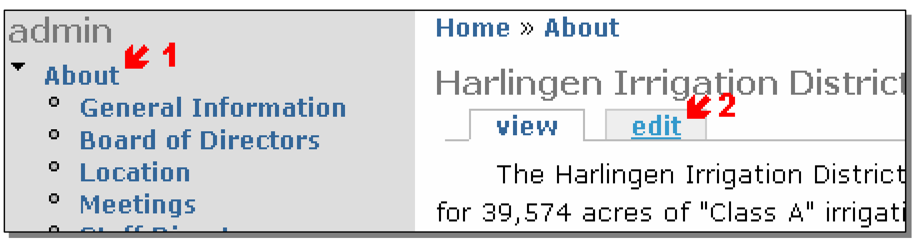
This brief users' guide provided a basic reference to editing, adding, and removing documents from the hidcc1.org website using the Content Management System. Using the CMS, you will be able to make changes to the website using our completely web-based interface.

2.3.2.2.2 Logging in

To log in to the Content Management System, point your web browser to http://www.hidcc1.org/user and enter your username and password.

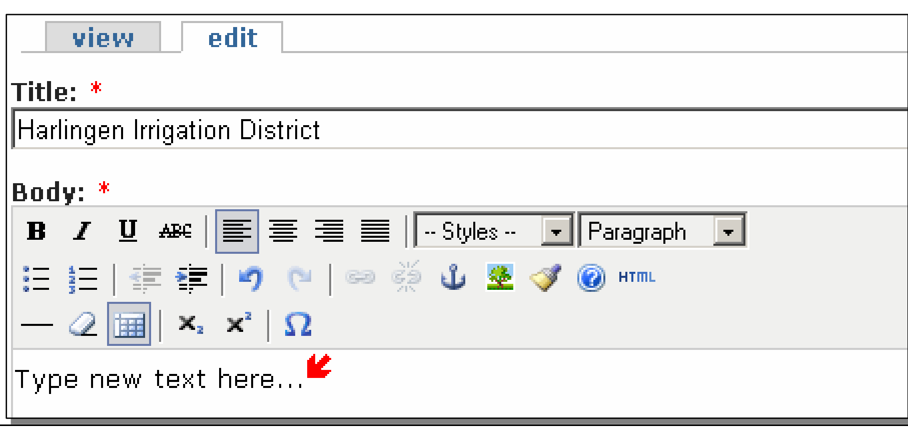


2.3.2.2.3 Updating Existing Content



To update existing content, log in and select the page you would like to edit from the grey menu on the left (1), and then click the 'edit' tab at the top of the page (2).

Next, edit the page as desired in the Body field.

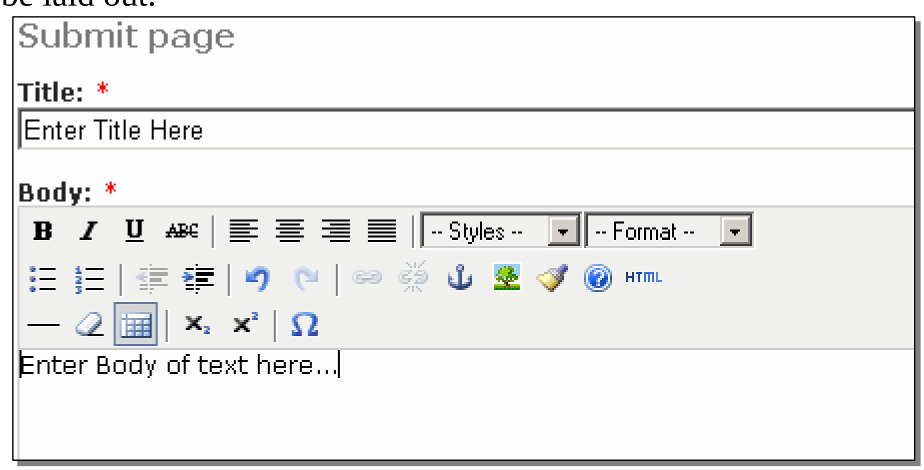


You may also alter how the page is listed in the site menu under 'Menu settings' or add/remove file attachments under 'File attachments'. Finally, remember to click 'Submit' when you are pleased with the changes that you've made.

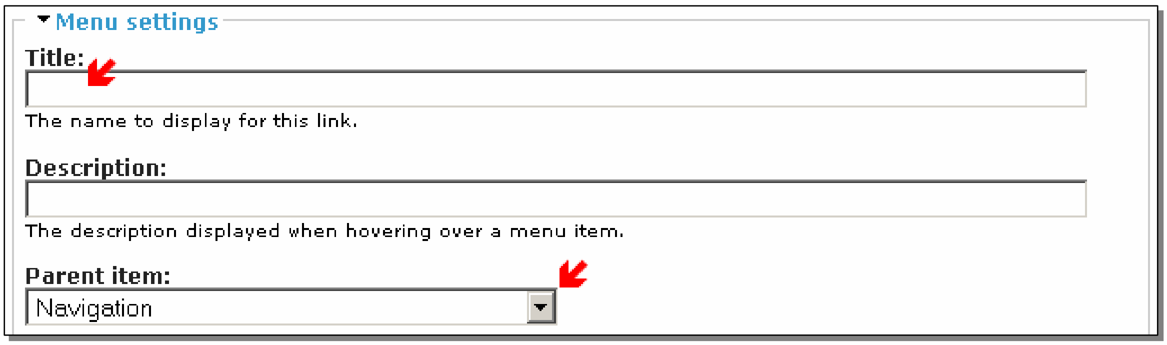
2.3.2.2.4 Creating New Content

If you would like to add a new page, log in and under the grey menu on the left, select 'create content'. You will then have a choice of what type of item you would like to create. For general web pages, select 'page', to add an item to the upcoming events calendar, select 'event'.

You must enter something for both the Title and Body of every item that you create. You may use the formatting toolbar above the Body section to select how you wish your item to be laid out.



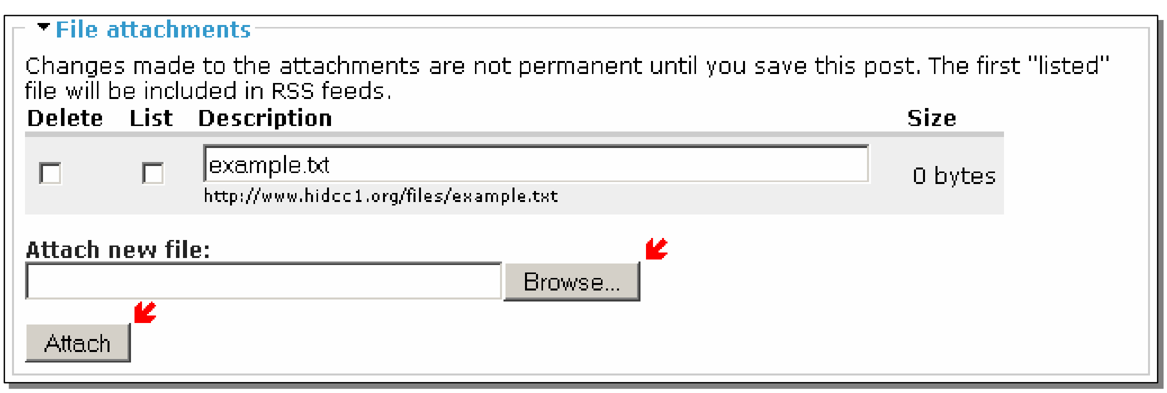
If you would like the item to be listed in the Navigation menu on the left so that users will be able to find it, you will need to specify how and where it should be listed. You will do this by expanding the ‘Menu settings’ section and entering the label you would like to appear in the menu in the ‘Title’ box and selecting the menu section under which you would like the item to appear.



If you would like this item to be displayed on the front page when users visit the site, select ‘Promoted to front page’ under ‘Publishing options’.

2.3.2.2.5 Posting Files

To post a file, you will use the ‘File attachments’ section. Click on ‘File attachments’ to expand the section. Next click ‘Browse’ to bring up the file selection dialog and select the file that you wish to post. Use the ‘Browse’ button instead of typing the filename directly. Do not alter the contents of the ‘Attach new File’ box; if you would like to label the file differently you will have a chance to do so later. After using the ‘Browse’ button to select the desired file, click ‘Attach’. Wait for the file to upload, then you will see it listed along with any other files currently attached to the page. If you would like the file to be listed for users to find and download, select the ‘List’ box next to the file. If you are uploading an image to be displayed on the page (as described later), leave the ‘List’ box unchecked. If you would like to give the file a label besides its filename, you may enter it in the box below ‘Description’ after Browsing and Attaching it. As always, be sure to click ‘Submit’ at the bottom of the page after making changes. You must do this before the files will become available to you or anyone else. If you need to post an attachment type that is not currently allowed, contact your system administrator.

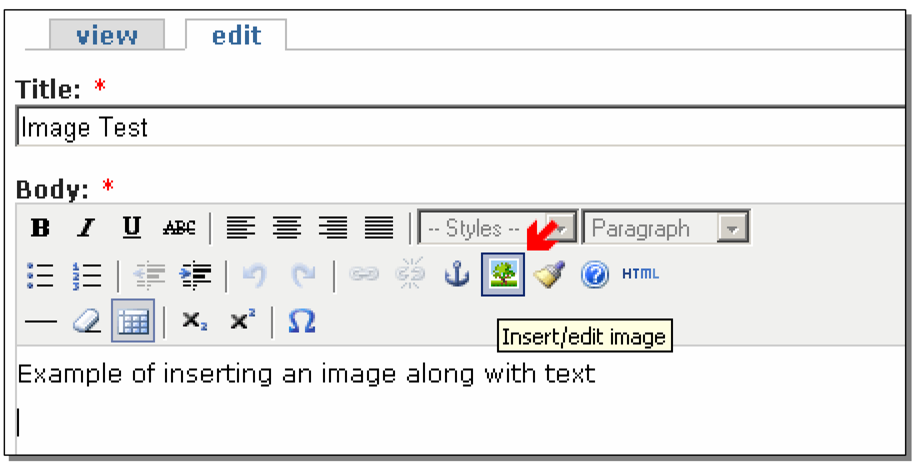


Remember to click Submit

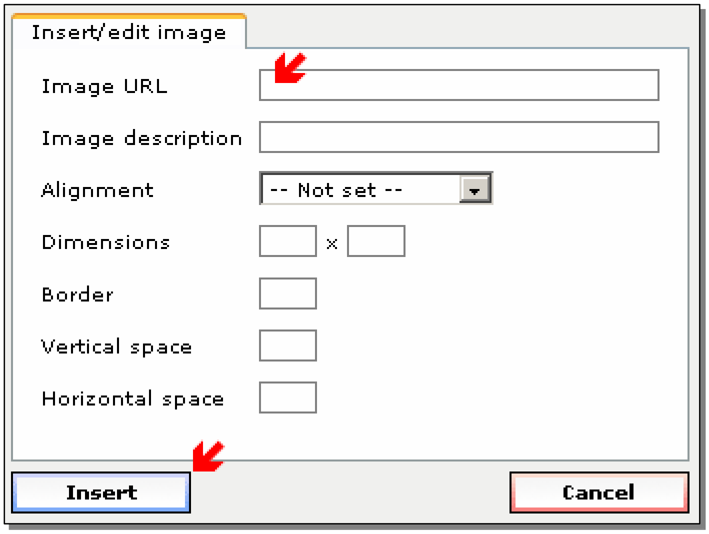
2.3.2.2.6 Inserting Images

To display an image, you will need to first attach the image file as described in the **Posting Files** section above and Submit the changes. When you have attached the file and Submitted the changes, return to the edit tab and you may then insert the file into the body of your text. You will need to look at the url text listed below the file description of the desired file. It will begin with http://www.hidcc1.org/files/. Copy this string, you will need to enter this text later.

After positioning the text cursor within the body text where you would like the image to be displayed, click the Insert/edit image button in the toolbar above to bring up the image properties dialog box.



In the 'Image URL' box, paste the exact text described above, then click 'Insert'.



You should now see the image displayed inline with the body text.

This task will extend into 2007 with the primary work being associated with providing a internet based data entry system for the field demonstration projects and the linking of the district's water ordering/account database with the real-time on-farm flow measurement telemetry system.

2.4 On-Farm Demonstration of Surge and Center Pivot Irrigation Systems

2.4.1 Task 4 Description

The Subcontractor shall provide technical assistance to the District, as requested in writing by the District, in the design and specification of any surge or center pivot irrigation systems used for demonstration projects and assist the District in developing the type of data and methods of data collection need for determining the irrigation efficiency and other water use data of the demonstration project.

2.4.2 Work Completed

No requests for support have been made other than attending technical meetings and advising on the need for detailed specifications for data collection.

2.5 Variable Speed Pump Control and Optimization of Delivery of On-Farm Demands

2.5.1 Task 4 Description

The Subcontractor will provide assistance to Delta Lake Irrigation District (DLID) in the design, implementation, and purchase of the pump controller/PLC to use with DLID pump equipment to demonstrate the use of internal combustion engines in matching the quantity of water diverted from the district canal for meeting irrigation demands. A technical workshop and the associated training materials will be prepared for training district managers in the proper design, installation, and cost of installing and operating variable speed drives, and the associated pumping and pipeline systems.

2.5.2 Work Completed

Work in 2006 primarily consisted of prepartion and giving of a training course on variable speed pumping plants and hydraulic modeling. This course was giving in March of 2006. Training manuals, software, and course review forms are available from the district. The SCADA PLC control specifications were developed for a diesel powered pumping plant and two locations were evaulated for the demonstration project. Delta Lake Irrigation District relift station 45 and HIDCC's Flow Measurement Calbration Facilities Rio Grande Lift pump # 7.

The project will continue in 2007 with the installation of the PLC at one or more sites and the addition of the site to the field demonstration day.

3. Project Task Budget

Table 3.1 indicates the budget and expenditures for each of the four tasks discussed. 58% of the budget has been expended with approximately the same amount of task work being completed.

Table 3.1: Project Task Budget

Task Budget March 1, 2006 through February 28, 2007 (4th Quarter Expenses)

	Task Budget	Expenses This Period	Previous Expenses	Accumulated Expenses	Balance Remaining	Percent Remaining
Task 1 Administration/Contracts	$ 5,020.00	$ 1,200.00	$ 190.00	$ 1,390.00	$ 3,630.00	72%
Task 2 Calibration Facility	$ 20,000.00	$ 1,365.00	$ 11,495.69	$ 12,860.69	$ 7,139.31	36%
Task 3 Internet User Info	$ 144,600.00	$ 5,032.50	$ 67,737.67	$ 72,770.17	$ 71,829.83	50%
Task 4 Technical Support	$ 4,800.00	$ -	$ -	$ -	$ 4,800.00	100%
Task 5 Variable Speed Pump	$ 45,800.00	$ -	$ 9,080.93	$ 9,080.93	$ 36,719.07	80%
Total	$ 220,220.00	$ 7,597.50	$ 88,504.29	$ 96,101.79	$ 124,118.21	56%

Expense Budget	Total Budget	Expenses This Period	Previous Total Expenses	Total Expenses Incurred	Balance Remaining	Percent Remaining
Salary and Wages [1]	$ 205,420.00	$ 7,097.50	$ 85,686.23	$ 92,783.73	$ 112,636.27	55%
Fringe[2] (20% of Salary)		$ -	$ -	$ -	$ -	
Travel (estimated)	$ 5,000.00	$ 500.00	$ 2,656.05	$ 3,156.05	$ 1,843.95	37%
Expendable Supplies (estimated)	$ 1,800.00	$ -	$ -	$ -	$ 1,800.00	100%
Capital Equipment		$ -	$ -	$ -	$ -	
Subcontracting Services	$ 8,000.00	$ -	$ -	$ -	$ 8,000.00	100%
Technical/Computer		$ -	$ -	$ -	$ -	0%
Reproduction	$ -	$ -	$ 162.01	$ 162.01	$ (162.01)	0%
Overhead		$ -	$ -	$ -	$ -	0%
Profit		$ -	$ -	$ -	$ -	0%
Profit					$ -	0%
Total	$ 220,220.00	$ 7,597.50	$ 88,504.29	$ 96,101.79	$ 124,118.21	56%

*amends quarterly reports. February. 2006 expense were accidentally included in the quarterly reports for the March 2006 through February 2007 time period.

Annual Progress Report

For the

Texas Water Development Board - Agricultural Water Conservation Demonstration Initiative Grant

Maximization of On-Farm Surface Water Use Efficiency by Integration of On-Farm Application and District Delivery Systems

On-Farm Flow Measurement Data Collection

Delta Lake Irrigation District

Submitted by
Delta Lake Irrigation District
General Manager:
Troy Allen

Appendix "A"

Executive Summary

The Delta Lake Irrigation District (DLID) has been contracted to collect manual on-farm metering information to be used for comparison with the automated metering system being installed in the Harlingen Irrigation District. The manual collection of data is in the third year of a three year process. Upon competition of the three year period DLID will have collected data to help determine the cost and effectiveness of manual meter reading as compared to the automated system used in Harlingen.

Scope of Work

The Delta Lake Irrigation District (DLID) has been monitoring on farm irrigation sites via manual meter readings for the past seven years. These sites encompass a variety of crops including, but not limited to carrots, onions, watermelons, cabbage, sugar cane, cotton, grain, citrus, and pastures. Data collected consists of Field ID, Grower Name, Start and Ending Times, Dates, and Meter Readings, Hours of Irrigation, Gallons per Minute, and Total Acre-Feet.

After collection and tabulation of the data, the numbers can be used to calculate information vital to the efficiency and well being of the water district.

There are a variety of meters that the field technician must become accustomed to reading. Some meters use acre-feet, and some use gallons as their unit of measure. Another challenge faced by the meter reader is to locate the meter, which can vary from field to field. For example, Pictures 1 and 2 For example, Pictures 1 and 2 show a meter that is affixed in the most common location, near the valve. Pictures 3, and 4 however illustrate a meter that has been affixed to the top of a drip pump filtration system, on which the meter reader must climb on top of to get the daily readings.

Picture 1

Picture 2

Picture 3

Picture 4

Picture 5

Picture 6

Pictures 5 shows the meter installed on a permanent drip pump site. Picture 6 is a meter installed on to of a pipeline incased in a concrete pipe for protection. An example of a meter that measures in acre-feet can be seen in picture 7

Picture 7

Pictures 8 and 9 demonstrate the progression of the watering process in a cabbage field. Picture 8 is in the early morning when the farmer began watering and picture 9 is in the afternoon approximately 6 hours after the water was started. Pictures 1 and 2 show the meter setup used for flood irrigation in this cabbage field.

Picture 8

Picture 9

A major step in the evaluation of manual meter readings vs. automated systems is the budget. Without this, it would be impossible to compare and contrast the validity of the opposing methods.

One field technician can efficiently read 5 to 7 meters per hour with an average of 5 to 8 miles per meter. Once a week the technician will input the data collected from the daily readings… this will generally take 1 to 3 hours depending on the number of sites that are in operation.

The District will generally have 40 to 80 meters running under normal irrigation, which can be handled by the technician and canal riders for backup if needed. When heavy irrigation starts we have to add technicians to read the additional meters, which in the past has been as many as 230 meter running at one time, this usually last for a few weeks at a time, two to three times a year. We have estimated a cost of $6.50 to $8.00 per meter to read the meter and input the data in to the system.

Below is an example of the data collected during irrigation. These tables represent the data collected on each metering site as well as an example of miles traveled and hours required to read meter.

9and10Blk3
Meter # 99-7915-5
Ticket#61200158
72Acres 60% of field watered = 43 Acres
Cantaloupe

DATE	*Start Time*	*Start Reading*	*End Time*	*End Reading*	GPM	*Ac/Ft*	*Gallons*	*Inches*	*Info*
1/19/2007	10:30A.M.	148.141			300				
1/20/2007	9:54A.M	151.631			300				
1/21/2007	8:38A.M.	153.183			300				
1/22/2007	2:55P.M.	155.926			300				
1/23/2007			3:00P.M.	157.186	300	9.045	2947322	2.52	

Date	Start Mileage	End Mileage	ADI Miles	DLID Miles	Hours
1/19/2007	5536	5653	46	71	1Hour30Min
1/20/2007	5650	5704	41	10	1Hour30Min
1/21/2007	5704	5745	21	20	30Min
1/22/2007	5745	5850	28	77	30Min
1/23/2007	5850	5945	18	77	30Min

Another part of our project was for the District to set up a Variable Speed Pump Site. The District has installed the pumps and motors for Re-lift Station No. 45 (the Variable Speed Pump Site), as well as the security fencing and trash rake. This site will ultimate be equipped with automatic start, shutdown, remote throttle control and any other hardware necessary to provide remote control of these pumps. The components for total automation will be ordered within the upcoming months. The District's expense to-date for the Variable Speed Pump System is $131,102.26. This expense is for the Pumps, Motors, security fence and trash rake.

The District is in the process of ordering all the components to complete the Variable Speed Pump project. The pumps are installed and currently in service. We hope to get the automated system online within the next few months. Below are pictures of the Pumps and Motors.




The above pictures were taken shortly after installation; we have since finished the catwalk and painting.

AGRICULTURAL DEMONSTRATION INITIATIVE
Texas Cooperative Extension, FARM Assistance Sub-Contract with Harlingen Irrigation
TCE Account # 422460 - Harlingen Irrigation District

Annual Contract Report for the period ending Feb 15, 2007

Scope of Work Task B.5
Economic Evaluation of Demonstrated Technologies, FARM Assistance Program

Activities and continual progress regarding the FARM Assistance task of the ADI project of the Harlingen Irrigation District revolves around two primary objectives. The first is collaborating with project management team and coordinating the FARM Assistance program into the project concepts, including participation in management team meetings, planning sessions, producer meetings, and contributions to project promotional materials. TCE faculty also supported the overall project effort of recruiting project demonstrators. The second objective is the completion of the economic analysis for project demonstrations. Economic analyses for individual demonstrators range from conducting an evaluation of the site demonstration to providing the complete FARM Assistance strategic analysis service for the demonstration participant. Analyses of the 2006 site demonstrations are included. A summary of the contact, status, and analysis conducted for 2006 demonstrators and potential 2007 demonstrators follows:

2005 Demonstrations

- Site 41A-B (cotton, surge irrigation)
  Completed volumetric irrigation cost Analysis—*Impact of Volumetric Water Pricing for Cotton Comparing Furrow vs. Surge Irrigation in the Lower Rio Grande Valley*. Farm Assistance *Focus* Series 2006-3, Texas Cooperative Extension, Texas A&M University System. http//:farmassistance.tamu.edu.

- Site 46A-B (sugarcane, surge irrigation)
  Completed volumetric irrigation cost Analysis—*Impact of Volumetric Water Pricing for Sugarcane Comparing Furrow vs. Surge Irrigation in the Lower Rio Grande Valley*. Farm Assistance *Focus* Series 2006-4, Texas Cooperative Extension, Texas A&M University System. http//:farmassistance.tamu.edu.

- *Water Conservation and Water Pricing in the Lower Rio Grande Valley*. Poster presented at the Southern Agricultural Economics Association 2007 Annual Meeting, Mobile, Alabama, February 4-6, 2007.

2006 Demonstrations

- Sites 1A-E (1A: Rio Red grapefruit, narrow border flood; 1B: Valencia oranges; narrow border flood; 1C: Rio Red grapefruit, narrow border flood; 1E: onions, 1-line drip)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Sites 28A-D (28A: Valencia Oranges, micro-jet spray; 28C: Rio Red grapefruit, micro-jet spray; 28D: early oranges, 2-line drip
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 41A-B (cotton, surge irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 42A-B (42A: grain sorghum, surge; 42B: cotton, surge irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 43A-B (43A: cotton, drip; 43B: cotton, furrow irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 44A (cotton, surge irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Site 45A (sugar cane, furrow irrigation)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (included)

- Oscar Alvarez (Tifton grass, LEP center pivot)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (not included)

- Bruce Gamble (corn & vegetables, drip)
  Conducted initial data collection, and developed preliminary analysis
  Conducted verification/validation meeting
  Completed and delivered FARM Assistance Strategic Analysis
  Completed demonstration site evaluation (not included)

2006 Potential Demonstrators

- Fernando Vieto, Sharyland Orchards
  Held introductory meeting with cooperator and provided information requirements
  Several attempts to conduct initial data collection have been cancelled by client.

- Levi Burns
  Held introductory meeting with cooperator and provided information requirements
  Several attempts to conduct initial data collection have been cancelled by client.

- Don & Tom Wetegrove
  Held introductory meeting with cooperator and provided information requirements
  Attempts to conduct initial data collection have not been successful.

- Mark Fryer
  Held introductory meeting with cooperator and provided information requirements
  Attempts in 2006 to conduct initial data collection were not successful.

- Richard Treadaway, Duda
  Held introductory meeting with cooperator and provided information requirements
  Attempts to conduct initial data collection have not been successful.

- Juan Ramirez
  Attempts to conduct initial data collection have not been successful.

2007 Potential Demonstrators

- Bruce Gamble
  Initial data collection meeting scheduled for early March

- Mark Fryer
  Initial data collection meeting scheduled for late February

- Jim Hoffmann
  Initial data collection meeting scheduled for late February

- Jim Pawlik
  Initial data collection meeting scheduled for early March

- Sam Morrow
  Initial data collection meeting scheduled for March

- B S Farms
  Initial data collection meeting scheduled for March

- Sharyland Orchards
  Initial data collection meeting scheduled for February or March

- Leonard Simmons
  Initial data collection meeting scheduled for April

- Tom McLemore
  Initial data collection meeting scheduled for September

- Chris Allen
  Initial data collection meeting scheduled for September

Water Conservation and Water Pricing in the Lower Rio Grande Valley

Melissa Jupe, Mac Young, Steven Klose, Greg Kaase & Jason Morris
Department of Agricultural Economics, Texas A&M University

Abstract:

The recent droughts in Texas have exacerbated the need for investigating water conservation methods to be used in the Lower Rio Grande Valley. This analysis illustrates the financial incentives to conserve water that may exist under volumetric water pricing. The Harlingen Irrigation District along with the Texas Water Development Board have recently implemented a project demonstrating water conserving practices. Initial demonstrations, for two 38-acre water sites, suggest the possibility of conserving water through the use of surge irrigation instead of traditional flood. However, the current abundance of surface water from the Rio Grande and existing pricing structures create no incentives for producers to invest in water conservation.

Introduction:

Surface water in the Texas Lower Rio Grande Valley is managed by the local irrigation districts. Historically, water usage in this area is paid for by access rather than volume. This pricing structure works well at times, but provides no financial incentive for the individual producer to conserve water. Existing state laws indicate that water is to be sold by volume. However, lack of metering equipment, tradition and the current availability of water makes these laws unenforceable. The potential of volumetric pricing structure is critical to financial viability and adoption of water conserving practices and systems.

Data:

Two specific 38-acre site demonstrations were linked to the Harlingen Irrigation District and the Texas Water Development Board demonstration projects in the Lower Rio Grande Valley. The 38-acre sites compare the use of surge irrigation to traditional flood in the production of cotton and sugarcane.

Methodology:

10 year financial simulation of returns for a specific enterprise using stochastic commodity prices and yields. Scenarios compare the financial performance of the enterprise under the existing water price structure and two volumetric pricing structures.

Results:

The implementation of surge irrigation appears to save water, but requires an initial investment of new equipment. With current water pricing the purchase of a surge irrigation valve is a losing proposition. However, if the current availability of low cost and plentiful irrigation water changes or if water districts switch to volumetric pricing, the profitability of both cotton and sugarcane production could be affected and the economic incentives to switch to surge irrigation systems will increase.

Cotton

Table 1: Irrigation Application and Cost Information for 38 acre Cotton site, Volumetric Pricing

Irrigation Method	Acre Inches Applied	Cost Per Acre Inch	Water Cost Per Acre	Polypipe & Irrigation Labor Per Acre	Irrigation Cost per Acre	Surge Valve
Furrow-1	19.53	$1	$19.53	$18.00	$37.53	
Surge-2	13.48	$1	$13.48	$18.00	$31.48	$1,800
Furrow-3	19.53	$5	$97.65	$18.00	$115.65	
Surge-4	13.48	$5	$67.40	$18.00	$85.40	$1,800

Table 2: 10-year Average Financial Indicators for 38 acre Cotton site, Volumetric Pricing

Irrigation Method	Net Cash Farm Income ($1,000)	Prob Net Cash Income < 0 (%)	Avg Annual Operating Expense/Receipts
Furrow-1	8.28	1.00	0.74
Surge-2	8.35	1.00	0.74
Furrow-3	5.09	8.30	0.85
Surge-4	6.15	3.90	0.81

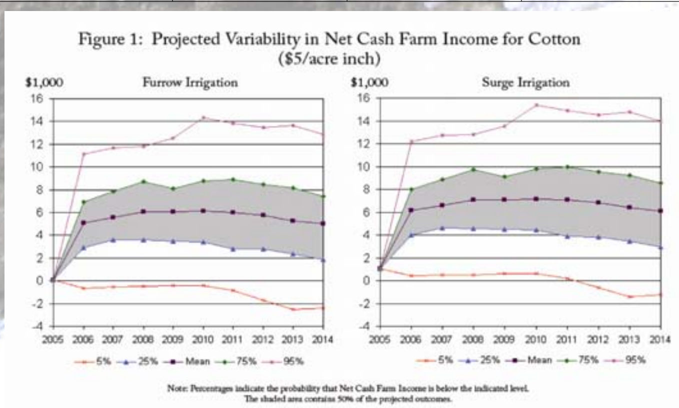
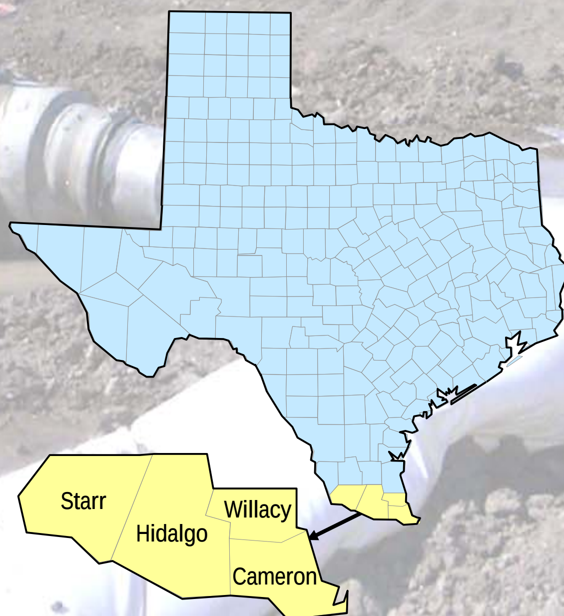


Figure 1: Projected Variability in Net Cash Farm Income for Cotton ($5/acre inch)

Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level. The shaded area contains 50% of the projected outcomes.



Sugarcane

Table 3: Irrigation Application and Cost Information for 38-acre Sugarcane site, Volumetric Pricing

Irrigation Method	Acre Inches Applied	Cost Per Acre Inch	Water Cost Per Acre	Polypipe & Irrigation Labor Per Acre	Irrigation Cost per Acre	Surge Valve
Furrow-1	30.68	$1	$30.68	$26.00	$56.68	
Surge-2	14.64	$1	$14.64	$26.00	$40.64	$1,800
Furrow-3	30.68	$5	$153.40	$26.00	$179.40	
Surge-4	14.64	$5	$73.20	$26.00	$99.20	$1,800

Table 4: 10-year Average Financial Indicators for 38-acre Sugarcane site, Volumetric Pricing

Irrigation Method	Net Cash Farm Income ($1,000)	Prob Net Cash Income < 0 (%)	Avg Annual Operating Expense/Receipts
Furrow-1	4.99	23.60	0.67
Surge-2	5.36	22.40	0.65
Furrow-3	0.70	46.30	0.84
Surge-4	3.33	30.90	0.73

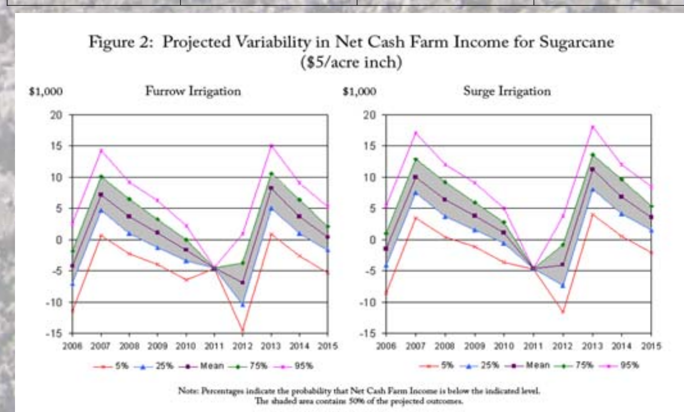


Figure 2: Projected Variability in Net Cash Farm Income for Sugarcane ($5/acre inch)

Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level. The shaded area contains 50% of the projected outcomes.

Conducted in Partnership with:

Agricultural Water Conservation Demonstration Initiative (ADI)

Harlingen Irrigation District

Texas Water Development Board

Demonstration Site 1A: Rio Red Grapefruit, Narrow Border Flood Irrigation

The basic costs of production assumptions for the Rio Red grapefruit demonstration are given in Table 1A-1. For the purpose of presenting economic viability and outlook for the 73-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 73 acres of narrow border flood irrigation Rio Red grapefruit production. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $200/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the narrow border flood irrigation is provided in Table 1A-2-A, followed by a cash flow summary (Table 1A-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1A-3 and Figure 1A-1. Table 1A-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $263,210 over the 10-year period and cash costs average $92,010. NCFI averages $171,200 due largely to the price being held at a constant $200/ton (Table 1A-3).

The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $20,000 to $354,000 for the site (Figure 1A-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $1.84 million by 2015 (Table 1A-3). The average cash flow balances (Table 1A-3) are intended to illustrate the cash requirements or flows generated using the narrow border flood irrigation method.

Table 1A-1. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Narrow Border Flood
PLANTED ACRES	73
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	18
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	200
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	0
HERBICIDES	0
INSECTICIDES	425
FUNGICIDES	0
CUSTOM APPLICATION	470
SCOUTING / OTHER	0
IRRIGATION FUEL	100
TILLAGE/HARVST FUEL	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	0
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	210
PREMIUM RATE ($/ACRE)	93.1
PREMIUM COSTS	6796.2998

Table 1A - 2 - A. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800	262,800
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**	**262,800**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	0	0	0	0	0	0	0	0	0	0
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	31,025	30,584	29,835	30,265	30,791	31,290	31,769	32,220	32,529	32,695
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	34,310	33,840	31,881	30,841	29,996	29,354	29,034	29,380	29,850	30,295
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	7,300	7,200	6,783	6,562	6,382	6,246	6,178	6,251	6,351	6,446
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	6,796	6,796	6,796	7,377	7,377	7,377	7,377	7,377	7,377	7,377
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	79,431	78,421	75,295	75,045	74,546	74,267	74,357	75,228	76,107	76,812
CASH RENT FOR CROPLAND	16,060	16,060	16,060	16,060	16,060	16,060	16,060	16,060	16,060	16,060
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	95,491	94,481	91,355	91,105	90,606	90,327	90,417	91,288	92,167	92,872
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**95,491**	**94,481**	**91,355**	**91,105**	**90,606**	**90,327**	**90,417**	**91,288**	**92,167**	**92,872**
NET CASH FARM INCOME	**167,309**	**168,319**	**171,445**	**171,695**	**172,194**	**172,473**	**172,383**	**171,512**	**170,633**	**169,928**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**167,309**	**168,319**	**171,445**	**171,695**	**172,194**	**172,473**	**172,383**	**171,512**	**170,633**	**169,928**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
CASH EXPENSES ($/ACRE)	1,308	1,294	1,251	1,248	1,241	1,237	1,239	1,251	1,263	1,272
NET CASH INCOME ($/ACRE)	2,292	2,306	2,349	2,352	2,359	2,363	2,361	2,349	2,337	2,328

Table 1A - 2 - B. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**167,309**	**338,188**	**514,672**	**694,242**	**877,057**	**1,063,124**	**1,252,304**	**1,444,104**	**1,638,709**
PLUS:										
NET CASH FARM INCOME	167,309	168,319	171,445	171,695	172,194	172,473	172,383	171,512	170,633	169,928
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	2,560	5,039	7,874	10,622	13,594	16,797	20,287	23,972	27,858
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**167,309**	**338,188**	**514,672**	**694,242**	**877,057**	**1,063,124**	**1,252,304**	**1,444,104**	**1,638,709**	**1,836,495**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	167,309	338,188	514,672	694,242	877,057	1,063,124	1,252,304	1,444,104	1,638,709	1,836,495
ENDING YEAR CASH RESERVE	**167,309**	**338,188**	**514,672**	**694,242**	**877,057**	**1,063,124**	**1,252,304**	**1,444,104**	**1,638,709**	**1,836,495**

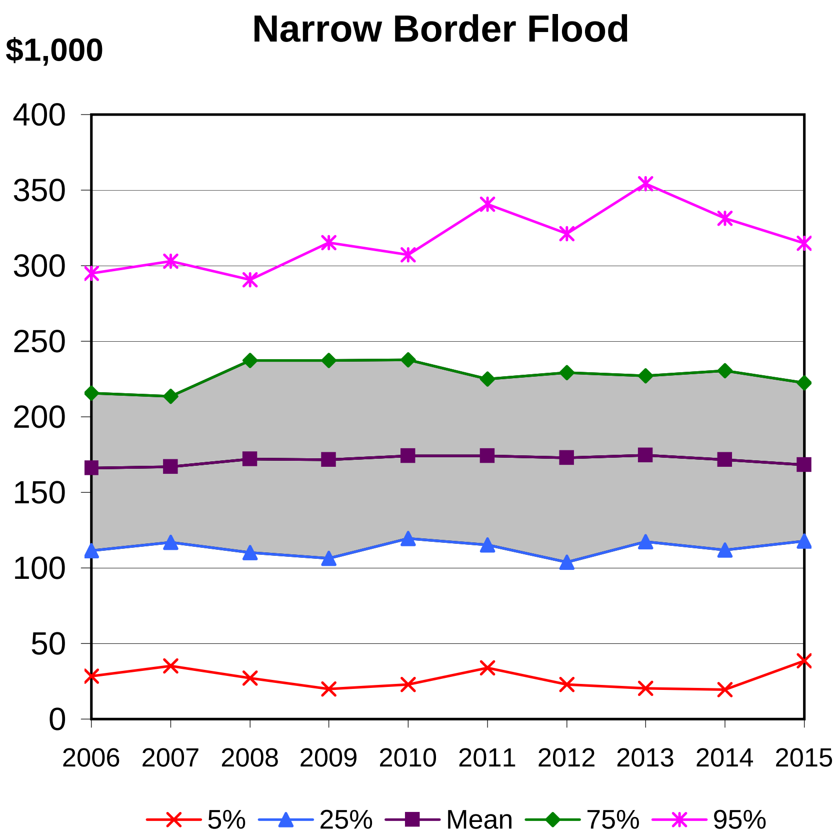
Table 1A-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Total Cash Receipts ($1000)	
2006	261.49
2007	261.65
2008	263.27
2009	262.52
2010	264.74
2011	264.30
2012	263.41
2013	265.74
2014	263.86
2015	261.15
2006-2015 Average	**263.21**
Total Cash Costs ($1000)	
2006	95.49
2007	94.49
2008	91.36
2009	91.10
2010	90.61
2011	90.33
2012	90.42
2013	91.29
2014	92.17
2015	92.87
2006-2015 Average	**92.01**
Net Cash Farm Income ($1000)	
2006	166.00
2007	167.16
2008	171.91
2009	171.42
2010	174.13
2011	173.97
2012	172.99
2013	174.45
2014	171.69
2015	168.28
2006-2015 Average	**171.20**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	2.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	2.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 1A-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Ending Cash Reserves ($1000)	
2006	166.00
2007	335.70
2008	512.61
2009	691.87
2010	876.59
2011	1,064.14
2012	1,253.95
2013	1,448.71
2014	1,644.45
2015	1,840.69
2006-2015 Average	**983.47**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.41
2007	0.40
2008	0.40
2009	0.39
2010	0.39
2011	0.39
2012	0.39
2013	0.40
2014	0.40
2015	0.40
2006-2015 Average	**0.40**

Figure 1A-1. Projected Variability in Net Cash Farm Income for Rio Red Grapefruit, Narrow Border Flood Irrigation.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

Demonstration Site 1B: Valencia Oranges, Narrow Border Flood Irrigation

The basic costs of production assumptions for the Valencia oranges demonstration are given in Table 1B-1. For the purpose of presenting economic viability and outlook for the 15-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 15 acres of narrow border flood irrigation Valencia oranges production. The orchard was assumed to be five years old. The Valencia orange price is held constant at $150/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the narrow border flood irrigation is provided in Table 1B-2-A, followed by a cash flow summary (Table 1B-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1B-3 and Figures 1B-1 and 1B-2. Table 1B-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $31,540 over the 10-year period and cash costs average $17,980. NCFI averages $13,560 due largely to the price being held at a constant $150/ton and increasing yields as trees mature (Table 1B-3). The risk associated with prices and yields suggests a 17.3% chance of negative NCFI. In a normal production year, NCFI could range as much as -$11,000 to $45,000 for the site (Figure 1B-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $144,460 by 2015 (Table 1B-3). The average cash flow balances (Table 1B-3) are intended to illustrate the cash requirements or flows generated using the narrow border flood irrigation method. Figure 1B-2 depicts the growth in cash reserves, and the risk associated with the ending cash balance by reflecting the probability of carryover debt over the 10-year projection. The probability of carryover is 41% in 2006 and then declines to 2% or less by 2013.

Table 1B-1. Valencia Oranges, Narrow Border Flood Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Yr5	Yr6	Yr7
PLANTED ACRES	15	15	15
BASE ACRES	0	0	0
YIELD UNITS	ton	ton	ton
BUDGETING YIELD	8	12	15
FARM PROG YLD DIR	0	0	0
FARM PROG YLD CCP	0	0	0
PRICES/YIELD UNIT	150	150	150
VARIABLE PRODUCTION COSTS ($/ACRE)			
SEED	0	0	0
FERTILIZER	0	0	0
HERBICIDES	0	0	0
INSECTICIDES	350	375	375
FUNGICIDES	0	0	0
CUSTOM APPLICATION	370	470	470
SCOUTING / OTHER	0	0	0
IRRIGATION FUEL	100	100	100
TILLAGE/HARVST FUEL	0	0	0
HARVESTING, HAULING, DRYING & CHECKOFF:			
$/YIELD UNIT	0	0	0
HARVEST COST/ACRE	0	0	0
BOLL WEEVIL COST/ACRE	0	0	0
LABOR COST /ACRE	0	0	0
CROP INSURANCE			
YIELD ELECTION (FRACTION)	0.5	0.5	0.5
YIELD COVERAGE GUARANTEE	0	0	0
PRICE ELECTION (FRACTION)	1	1	1
PRICE GUARANTEE	210	0	0
PREMIUM RATE ($/ACRE)	61.71	80.33	93.1
PREMIUM COSTS	925.65	0	0

Table 1B - 2 - A. Valencia Oranges, Narrow Border Flood Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	18,000	27,000	33,750	33,750	33,750	33,750	33,750	33,750	33,750	33,750
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**18,000**	**27,000**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**	**33,750**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	0	0	0	0	0	0	0	0	0	0
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	5,250	5,545	5,409	5,487	5,583	5,673	5,760	5,842	5,898	5,928
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	5,550	6,953	6,551	6,337	6,164	6,032	5,966	6,037	6,134	6,225
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,500	1,479	1,394	1,348	1,311	1,283	1,269	1,284	1,305	1,324
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	926	1,205	1,396	1,516	1,516	1,516	1,516	1,516	1,516	1,516
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	13,226	15,183	14,750	14,689	14,573	14,504	14,511	14,679	14,852	14,993
CASH RENT FOR CROPLAND	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	16,526	18,483	18,050	17,989	17,873	17,804	17,811	17,979	18,152	18,293
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**16,526**	**18,483**	**18,050**	**17,989**	**17,873**	**17,804**	**17,811**	**17,979**	**18,152**	**18,293**
NET CASH FARM INCOME	**1,474**	**8,517**	**15,700**	**15,761**	**15,877**	**15,946**	**15,939**	**15,771**	**15,598**	**15,457**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**1,474**	**8,517**	**15,700**	**15,761**	**15,877**	**15,946**	**15,939**	**15,771**	**15,598**	**15,457**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	1,200	1,800	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250
CASH EXPENSES ($/ACRE)	1,102	1,232	1,203	1,199	1,192	1,187	1,187	1,199	1,210	1,220
NET CASH INCOME ($/ACRE)	98	568	1,047	1,051	1,058	1,063	1,063	1,051	1,040	1,030

Table 1B - 2 - B. Valencia Oranges, Narrow Border Flood Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**1,474**	**10,014**	**25,863**	**42,020**	**58,539**	**75,393**	**92,523**	**109,793**	**127,214**
PLUS:										
NET CASH FARM INCOME	1,474	8,517	15,700	15,761	15,877	15,946	15,939	15,771	15,598	15,457
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	23	149	396	643	907	1,191	1,499	1,823	2,163
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**1,474**	**10,014**	**25,863**	**42,020**	**58,539**	**75,393**	**92,523**	**109,793**	**127,214**	**144,833**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	1,474	10,014	25,863	42,020	58,539	75,393	92,523	109,793	127,214	144,833
ENDING YEAR CASH RESERVE	**1,474**	**10,014**	**25,863**	**42,020**	**58,539**	**75,393**	**92,523**	**109,793**	**127,214**	**144,833**

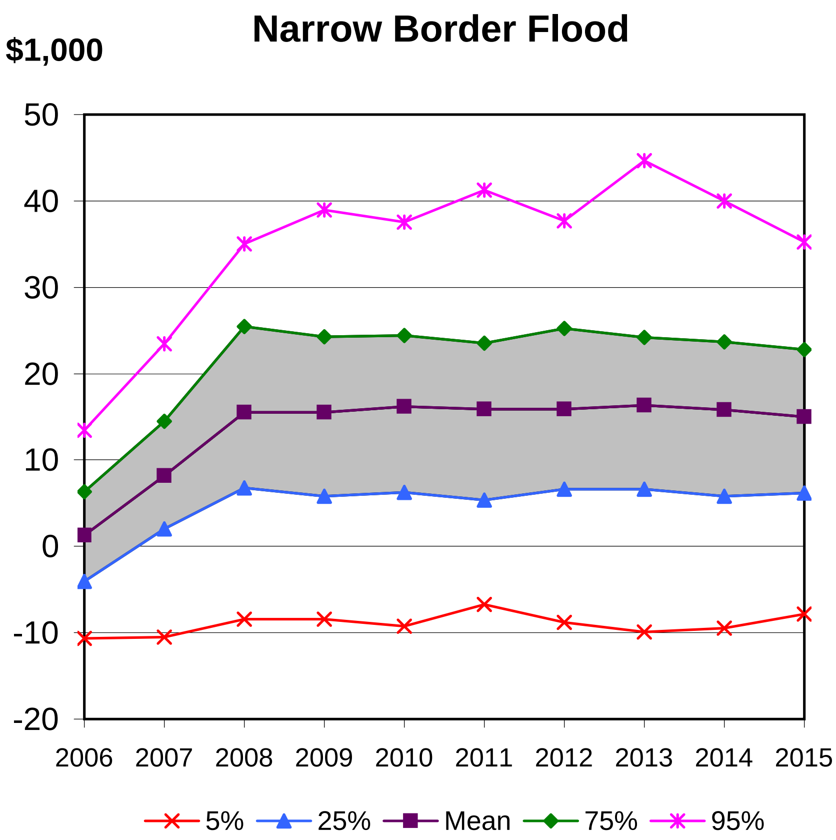
Table 1B-3. Valencia Oranges, Narrow Borde Flood Irrigation Demonstration

	Narrow Border Flood
Total Cash Receipts ($1000)	
2006	17.82
2007	26.84
2008	33.68
2009	33.62
2010	34.15
2011	33.75
2012	33.77
2013	34.42
2014	34.02
2015	33.36
2006-2015 Average	**31.54**
Total Cash Costs ($1000)	
2006	16.53
2007	18.68
2008	18.18
2009	18.09
2010	17.94
2011	17.87
2012	17.88
2013	18.05
2014	18.24
2015	18.39
2006-2015 Average	**17.98**
Net Cash Farm Income ($1000)	
2006	1.29
2007	8.16
2008	15.49
2009	15.53
2010	16.21
2011	15.87
2012	15.89
2013	16.37
2014	15.78
2015	14.98
2006-2015 Average	**13.56**
Prob. Net Cash Income < Zero (%)	
2006	41.00
2007	19.00
2008	14.00
2009	12.00
2010	15.00
2011	14.00
2012	14.00
2013	14.00
2014	14.00
2015	16.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**17.30**

Table 1B-3. Valencia Oranges, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Ending Cash Reserves ($1000)	
2006	1.29
2007	9.51
2008	25.16
2009	41.10
2010	57.95
2011	74.73
2012	91.81
2013	109.68
2014	127.30
2015	144.46
2006-2015 Average	**68.30**
Prob. of Ending Cash Reserves < Zero (%)	
2006	41.00
2007	22.00
2008	9.00
2009	4.00
2010	5.00
2011	4.00
2012	3.00
2013	2.00
2014	2.00
2015	2.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**9.40**
Average Annual Operating Expense/Receipts	
2006	1.18
2007	0.86
2008	0.69
2009	0.68
2010	0.69
2011	0.67
2012	0.68
2013	0.69
2014	0.70
2015	0.69
2006-2015 Average	**0.75**

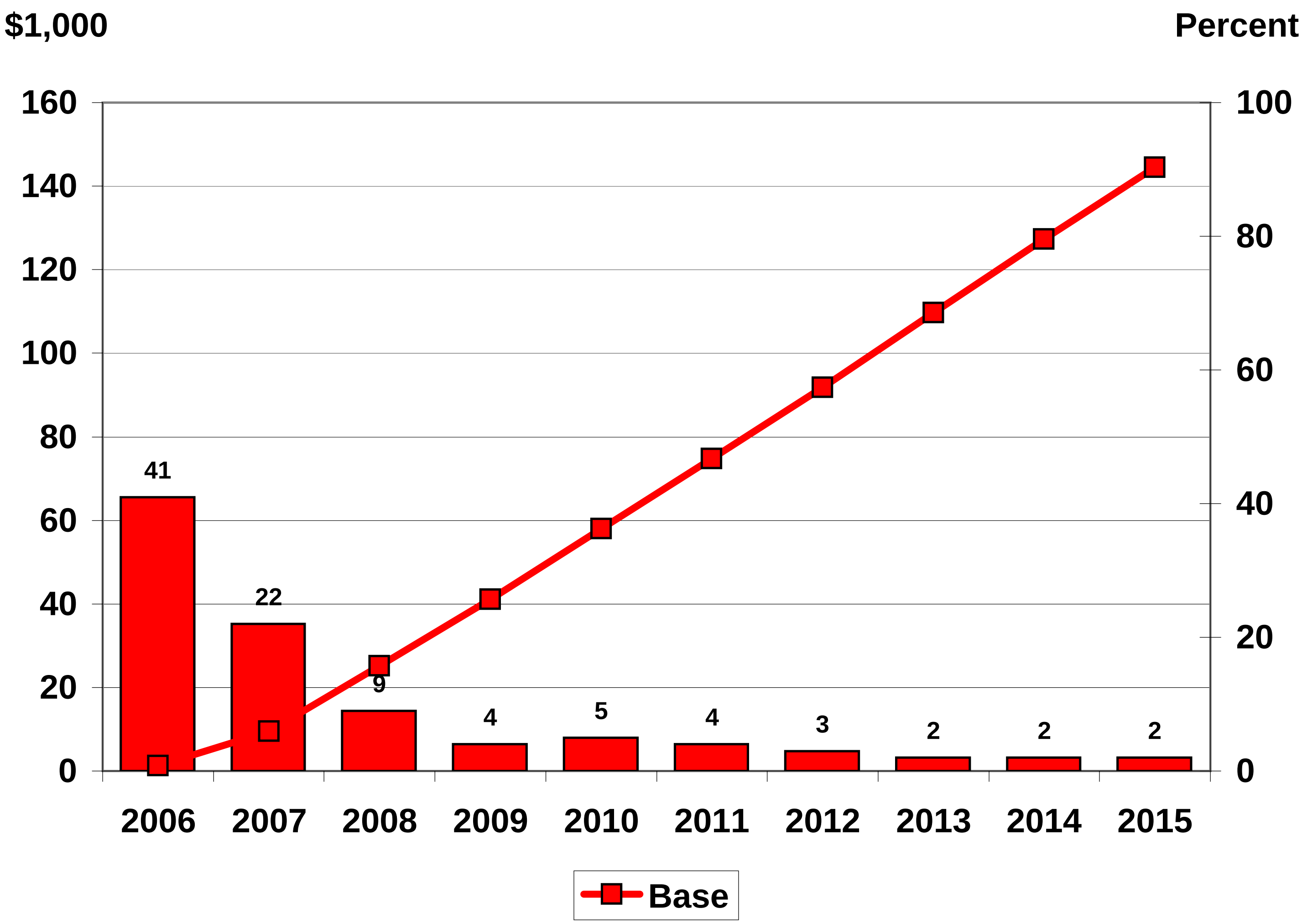
Figure 1B-1. Projected Variability in Net Cash Farm Income for Valencia Oranges, Narrow Border Flood Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 1B-2. Ending Cash Reserves and Probability of Having to Refinance Operating Note for Valencia Oranges, Narrow Borde Flood Irrigation Demonstration.



FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 1C: Rio Red Grapefruit, Narrow Border Flood Irrigation

The basic costs of production assumptions for the Rio Red grapefruit demonstration are given in Table 1C-1. For the purpose of presenting economic viability and outlook for the 85-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 85 acres of narrow border flood irrigation Rio Red grapefruit production. The orchard was assumed to be 5 years old. The Rio Red grapefruit price is held constant at $200/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the narrow border flood irrigation is provided in Table 1C-2-A, followed by a cash flow summary (Table 1C-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1C-3 and Figure 1C-1. Table 1C-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $376,220 over the 10-year period and cash costs average $102,350. NCFI averages $273,870 due largely to the price being held at a constant $200/ton and increasing yields for maturing trees (Table 1C-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $33,000 to $561,000 for the site (Figure 1C-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $2.9 million by 2015 (Table 1C-3). The average cash flow balances (Table 1C-3) are intended to illustrate the cash requirements or flows generated using the narrow border flood spray irrigation method.

Table 1C-1. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Yr5	Yr6	Yr7
PLANTED ACRES	85	85	85
BASE ACRES	0	0	0
YIELD UNITS	ton	ton	ton
BUDGETING YIELD	17	20	23
FARM PROG YLD DIR	0	0	0
FARM PROG YLD CCP	0	0	0
PRICES/YIELD UNIT	200	200	200
VARIABLE PRODUCTION COSTS ($/ACRE)			
SEED	0	0	0
FERTILIZER	0	0	0
HERBICIDES	0	0	0
INSECTICIDES	350	375	375
FUNGICIDES	0	0	0
CUSTOM APPLICATION	470	470	470
SCOUTING / OTHER	0	0	0
IRRIGATION FUEL	100	100	100
TILLAGE/HARVST FUEL	0	0	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0	0	0
HARVEST COST/ACRE	0	0	0
BOLL WEEVIL COST/ACRE	0	0	0
LABOR COST /ACRE	0	0	0
CROP INSURANCE			
YIELD ELECTION (FRACTION)	0.5	0.5	0.5
YIELD COVERAGE GUARANTEE	0	0	0
PRICE ELECTION (FRACTION)	1	1	1
PRICE GUARANTEE	210	0	0
PREMIUM RATE ($/ACRE)	71.7	80.83	93.1
PREMIUM COSTS	6094.4995	0	0

Table 1C - 2 - A. Rio Red Grapefruit, Narrrow Border Flood Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	289,000	340,000	391,000	391,000	391,000	391,000	391,000	391,000	391,000	391,000
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**289,000**	**340,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**	**391,000**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	0	0	0	0	0	0	0	0	0	0
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	29,750	31,422	30,653	31,094	31,635	32,147	32,639	33,103	33,421	33,591
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	39,950	39,403	37,121	35,911	34,927	34,180	33,807	34,209	34,757	35,275
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	8,500	8,384	7,898	7,641	7,431	7,272	7,193	7,279	7,395	7,505
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	6,094	6,871	7,914	8,589	8,589	8,589	8,589	8,589	8,589	8,589
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	84,294	86,079	83,585	83,235	82,583	82,189	82,229	83,180	84,162	84,960
CASH RENT FOR CROPLAND	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700	18,700
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	102,994	104,779	102,285	101,935	101,283	100,889	100,929	101,880	102,862	103,660
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**102,994**	**104,779**	**102,285**	**101,935**	**101,283**	**100,889**	**100,929**	**101,880**	**102,862**	**103,660**
NET CASH FARM INCOME	**186,006**	**235,221**	**288,715**	**289,065**	**289,717**	**290,111**	**290,071**	**289,120**	**288,138**	**287,340**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**186,006**	**235,221**	**288,715**	**289,065**	**289,717**	**290,111**	**290,071**	**289,120**	**288,138**	**287,340**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	3,400	4,000	4,600	4,600	4,600	4,600	4,600	4,600	4,600	4,600
CASH EXPENSES ($/ACRE)	1,212	1,233	1,203	1,199	1,192	1,187	1,187	1,199	1,210	1,220
NET CASH INCOME ($/ACRE)	2,188	2,767	3,397	3,401	3,408	3,413	3,413	3,401	3,390	3,380

Table 1C - 2 - B. Rio Red Crapefruit, Narrow Border Flood Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**186,006**	**424,072**	**719,105**	**1,019,173**	**1,324,484**	**1,635,124**	**1,951,030**	**2,271,757**	**2,597,606**
PLUS:										
NET CASH FARM INCOME	186,006	235,221	288,715	289,065	289,717	290,111	290,071	289,120	288,138	287,340
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	2,846	6,319	11,002	15,593	20,529	25,835	31,607	37,711	44,159
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**186,006**	**424,072**	**719,105**	**1,019,173**	**1,324,484**	**1,635,124**	**1,951,030**	**2,271,757**	**2,597,606**	**2,929,106**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	186,006	424,072	719,105	1,019,173	1,324,484	1,635,124	1,951,030	2,271,757	2,597,606	2,929,106
ENDING YEAR CASH RESERVE	**186,006**	**424,072**	**719,105**	**1,019,173**	**1,324,484**	**1,635,124**	**1,951,030**	**2,271,757**	**2,597,606**	**2,929,106**

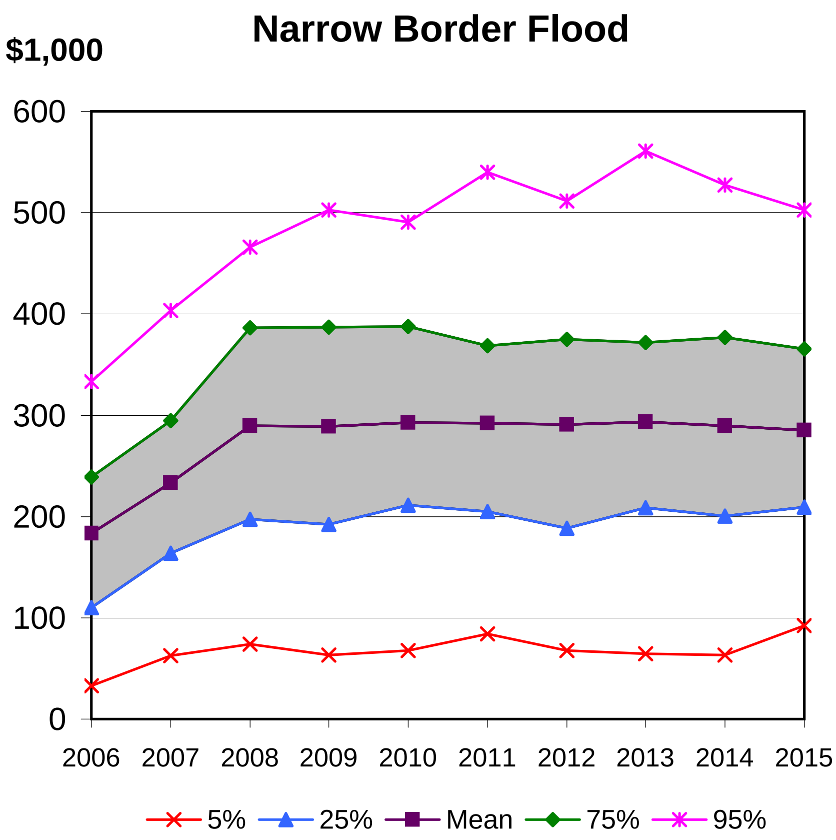
Table 1C-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Total Cash Receipts ($1000)	
2006	286.31
2007	338.14
2008	391.69
2009	390.59
2010	393.88
2011	393.23
2012	391.90
2013	395.37
2014	392.58
2015	388.54
2006-2015 Average	**376.22**
Total Cash Costs ($1000)	
2006	102.99
2007	104.79
2008	102.29
2009	101.93
2010	101.28
2011	100.89
2012	100.93
2013	101.88
2014	102.86
2015	103.66
2006-2015 Average	**102.35**
Net Cash Farm Income ($1000)	
2006	183.32
2007	233.35
2008	289.41
2009	288.65
2010	292.60
2011	292.34
2012	290.98
2013	293.49
2014	289.72
2015	284.88
2006-2015 Average	**273.87**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 1C-3. Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration

	Narrow Border Flood
Ending Cash Reserves ($1000)	
2006	183.32
2007	419.47
2008	715.13
2009	1,014.73
2010	1,322.85
2011	1,635.69
2012	1,952.51
2013	2,277.63
2014	2,605.16
2015	2,934.33
2006-2015 Average	**1,506.08**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.40
2007	0.35
2008	0.30
2009	0.30
2010	0.30
2011	0.29
2012	0.29
2013	0.30
2014	0.30
2015	0.30
2006-2015 Average	**0.31**

Figure 1C-1. Projected Variability in Net Cash Farm Income for Rio Red Grapefruit, Narrow Border Flood Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance

Helping Agriculture Make Informed Decisions

Demonstration Site 1E: Yellow Onions, 1-Line Drip Irrigation

The basic costs of production assumptions for the yellow onions demonstration are given in Table 1E-1. For the purpose of presenting economic viability and outlook for the 52-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 52 acres of 1-line drip irrigation yellow onions production. The onions were planted on 80-inch beds. The yellow onions cash receipts were calculated on a $1,150/acre basis and held constant during the 10-year projection. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a 1-line drip irrigation system at a cost of $1,550 per acre, including projected drip tape replacement. The 1-line drip system expense is evenly distributed ($155/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the 1-line irrigation is provided in Table 1E-2-A, followed by a cash flow summary (Table 1E-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 1E-3 and Figure 1E-1. Table 1E-3

presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $60,040 over the 10-year period and cash costs average $54,420. NCFI averages $5,620 due largely to gross receipts per acre being held at a constant $1,150 per acre (Table 1E-3). The risk associated with prices and yields suggests a 29.1% chance of negative NCFI. In a normal production year, NCFI could range as much as -$20,000 to $27,000 for the site (Figure 1E-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $59,260 by 2015 (Table 1E-3). The average cash flow balances (Table 1E-3) are intended to illustrate the cash requirements or flows generated using the 1-line drip irrigation method.

Table 1E-1. Yellow Onions, 1-Line Drip Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Onion
PLANTED ACRES	52
BASE ACRES	0
YIELD UNITS	$$$
BUDGETING YIELD	1150
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	1
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	150
FERTILIZER	100.5
HERBICIDES	0
INSECTICIDES	167.55
FUNGICIDES	0
CUSTOM APPLICATION	41
SCOUTING / OTHER	0
IRRIGATION FUEL	90
TILLAGE/HARVST FUEL	39.75
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	120
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	0
PREMIUM RATE ($/ACRE)	70
PREMIUM COSTS	3640

Table 1E - 2 - A. Yellow Onions, 1-Line Drip Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	59,800	59,800	59,800	59,800	59,800	59,800	59,800	59,800	59,800	59,800
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**	**59,800**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	7,800	7,914	7,811	7,887	8,000	8,132	8,206	8,302	8,385	8,452
FERTILIZER COSTS	5,226	5,256	5,198	5,138	5,208	5,254	5,287	5,377	5,459	5,515
HERBICIDE COSTS	0	0	0	0	0	0	0	0	0	0
INSECTICIDE COSTS	8,713	8,589	8,378	8,499	8,647	8,787	8,922	9,048	9,135	9,182
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	2,132	2,103	1,981	1,916	1,864	1,824	1,804	1,826	1,855	1,882
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	4,680	4,616	4,349	4,207	4,092	4,004	3,960	4,008	4,072	4,132
FUEL & LUBE COSTS	2,067	2,039	1,921	1,858	1,807	1,768	1,749	1,770	1,798	1,825
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640	3,640
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	6,240	6,430	6,638	6,823	6,988	7,171	7,356	7,527	7,707	7,885
SUB-TOTAL OF PROD COSTS	40,498	40,586	39,916	39,967	40,246	40,581	40,924	41,498	42,050	42,514
CASH RENT FOR CROPLAND	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900	3,900
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Drip Sys	8,060	8,060	8,060	8,060	8,060	8,060	8,060	8,060	8,060	8,060
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	52,458	52,546	51,876	51,927	52,206	52,541	52,884	53,458	54,010	54,474
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	2,229	2,040	1,760	1,517	1,251	994	734	483	235	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**54,687**	**54,585**	**53,636**	**53,444**	**53,456**	**53,535**	**53,618**	**53,940**	**54,245**	**54,474**
NET CASH FARM INCOME	**5,113**	**5,215**	**6,164**	**6,356**	**6,344**	**6,265**	**6,182**	**5,860**	**5,555**	**5,326**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**5,113**	**5,215**	**6,164**	**6,356**	**6,344**	**6,265**	**6,182**	**5,860**	**5,555**	**5,326**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150
CASH EXPENSES ($/ACRE)	1,052	1,050	1,031	1,028	1,028	1,030	1,031	1,037	1,043	1,048
NET CASH INCOME ($/ACRE)	98	100	119	122	122	120	119	113	107	102

Table 1E - 2 - B. Yellow Onions, 1-Line Drip Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**5,113**	**10,367**	**16,608**	**23,090**	**29,611**	**36,105**	**42,573**	**48,777**	**54,737**
PLUS:										
NET CASH FARM INCOME	5,113	5,215	6,164	6,356	6,344	6,265	6,182	5,860	5,555	5,326
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	39	77	127	177	229	285	345	405	468
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**5,113**	**10,367**	**16,608**	**23,090**	**29,611**	**36,105**	**42,573**	**48,777**	**54,737**	**60,531**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	5,113	10,367	16,608	23,090	29,611	36,105	42,573	48,777	54,737	60,531
ENDING YEAR CASH RESERVE	**5,113**	**10,367**	**16,608**	**23,090**	**29,611**	**36,105**	**42,573**	**48,777**	**54,737**	**60,531**

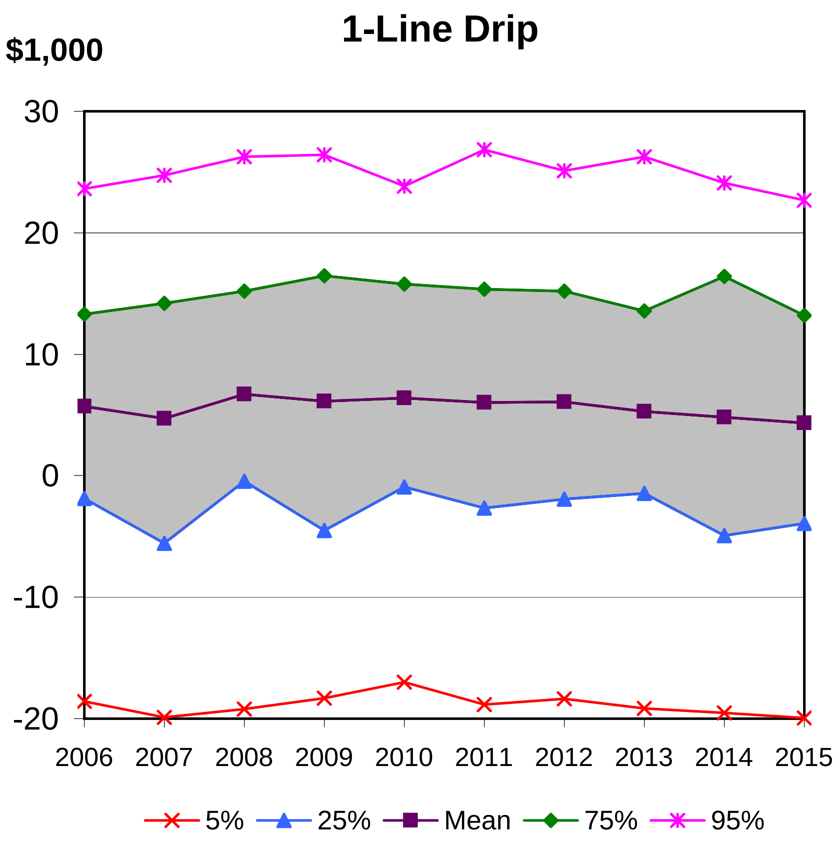
Table 1E-3. Yellow Onions, 1-Line Drip Irrigation Demonstration

	1-Line Drip
Total Cash Receipts ($1000)	
2006	60.41
2007	59.38
2008	60.52
2009	59.75
2010	60.16
2011	59.96
2012	60.28
2013	59.93
2014	60.00
2015	60.04
2006-2015 Average	**60.04**
Total Cash Costs ($1000)	
2006	54.69
2007	54.68
2008	53.80
2009	53.64
2010	53.75
2011	53.94
2012	54.21
2013	54.66
2014	55.18
2015	55.69
2006-2015 Average	**54.42**
Net Cash Farm Income ($1000)	
2006	5.72
2007	4.71
2008	6.72
2009	6.11
2010	6.42
2011	6.02
2012	6.07
2013	5.28
2014	4.82
2015	4.35
2006-2015 Average	**5.62**
Prob. Net Cash Income < Zero (%)	
2006	31.00
2007	32.00
2008	28.00
2009	28.00
2010	26.00
2011	27.00
2012	28.00
2013	31.00
2014	32.00
2015	28.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**29.10**

Table 1E-3. Yellow Onions, 1-Line Drip Irrigation Demonstration

	1-Line Drip
Ending Cash Reserves ($1000)	
2006	5.72
2007	10.49
2008	17.32
2009	23.61
2010	30.26
2011	36.59
2012	43.06
2013	48.82
2014	54.22
2015	59.26
2006-2015 Average	**32.94**
Prob. of Ending Cash Reserves < Zero (%)	
2006	31.00
2007	27.00
2008	24.00
2009	22.00
2010	21.00
2011	18.00
2012	18.00
2013	17.00
2014	15.00
2015	17.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**21.00**
Average Annual Operating Expense/Receipts	
2006	0.91
2007	0.94
2008	0.91
2009	0.93
2010	0.92
2011	0.93
2012	0.93
2013	0.94
2014	0.96
2015	0.96
2006-2015 Average	**0.93**

Figure 1E-1. Projected Variability in Net Cash Farm Income for the Yellow Onions, 1-Line Drip Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 28A: Valencia Oranges, Microjet Spray Irrigation

The basic costs of production assumptions for the Valencia orange microjet spray demonstration are given in Table 28A-1. For the purpose of presenting economic viability and outlook for the 8-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 8 acres of microjet spray irrigation Valencia orange production. The orchard trees were assumed to be 3 years old. The Valencia orange price is held constant at $140/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the microjet spray irrigation is provided in Table 28A-2-A, followed by a cash flow summary (Table 28A-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 28A-3 and Figures 28A-1 and 28A-2. Table 28A-3 presents the average outcomes for selected financial projections,

while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $15,480 over the 10-year period and cash costs average just under $8,000. NCFI is negative in 2006-2008 reflecting lower levels of production from immature trees. It then increases from $2,880 in 2009 to about $16,000 in 2015 (Table 28A-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI after 2011 when the trees reach maturity. In a normal production year and mature trees (2011-2015), NCFI could range as much as $3,500 to $34,000 for the site (Figure 28A-1). Cash reserves are expected to be negative in 2006-2009 and then grow throughout the remaining years of the projection period and reach $78,060 by 2015 (Table 28A-3). The average cash flow balances (Table 28A-3) are intended to illustrate the cash requirements or flows generated using the microjet spray irrigation method in a maturing orchard. Figure 28A-2 depicts the growth in cash reserves, and the risk associated with the ending cash balance by reflecting the probability of carryover operating debt in the early years of the projection. The probability of carryover debt is 99% or greater during 2006-2008 and then declines to 1% or less in 2013 as the trees reach maturity and annual production increases.

Table 28A-1. Valencia Oranges, Microjet Spray Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Valencia YR4	Valencia YR5	Valencia YR6	Valencia Yr7	Valencia YR8
PLANTED ACRES	8	0	0	0	0
BASE ACRES	0	0	0	0	0
YIELD UNITS	ton	ton	ton	ton	ton
BUDGETING YIELD	0.5	3	5	10	15
FARM PROG YLD DIR	0	0	0	0	0
FARM PROG YLD CCP	0	0	0	0	0
PRICES/YIELD UNIT	140	140	140	140	140
VARIABLE PRODUCTION COSTS ($/ACRE)					
SEED	0	0	0	0	0
FERTILIZER	25	35	45	55	85
HERBICIDES	50	63	75	88	100
INSECTICIDES	75	126	148	179	210
FUNGICIDES	0	0	40	40	40
CUSTOM APPLICATION	42.5	46	49	52	55
SCOUTING / OTHER	0	0	0	0	0
IRRIGATION FUEL	55	69	83	96	110
TILLAGE/HARVST FUEL	0	0	0	0	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0	0	0	0	0
HARVEST COST/ACRE	0	0	0	0	0
BOLL WEEVIL COST/ACRE	0	0	0	0	0
LABOR COST /ACRE	94	94	94	94	94
CROP INSURANCE					
YIELD ELECTION (FRACTION)	0.5	0.5	0.5	0.5	0.5
YIELD COVERAGE GUARANTEE	0	0	0	0	0
PRICE ELECTION (FRACTION)	1	1	1	1	1
PRICE GUARANTEE	150	0	0	0	0
PREMIUM RATE ($/ACRE)	35	95	95	105	110
PREMIUM COSTS	280	0	0	0	0

Table 28A - 2 - A. Valencia Oranges, Microjet Spray Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	560	3,360	5,600	11,200	16,800	20,160	23,520	24,640	24,640	24,640
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**560**	**3,360**	**5,600**	**11,200**	**16,800**	**20,160**	**23,520**	**24,640**	**24,640**	**24,640**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	200	282	358	433	678	684	688	700	710	718
HERBICIDE COSTS	400	502	591	700	803	811	819	830	838	844
INSECTICIDE COSTS	600	994	1,139	1,397	1,667	1,694	1,720	1,745	1,761	1,770
FUNGICIDE COSTS	0	0	324	329	333	337	341	345	349	352
CUSTOM APPLICATION	340	363	364	374	385	376	372	377	383	389
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	440	544	617	690	769	753	745	754	766	777
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	280	760	760	840	880	880	880	880	880	880
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	752	775	800	822	842	864	886	907	929	950
SUB-TOTAL OF PROD COSTS	3,012	4,220	4,953	5,585	6,357	6,400	6,452	6,537	6,616	6,680
CASH RENT FOR CROPLAND	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Microjet Sys	800	800	800	800	800	800	800	800	800	800
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	5,012	6,220	6,953	7,585	8,357	8,400	8,452	8,537	8,616	8,680
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	343	580	737	516	0	0	0	0	0
TOTAL CASH EXPENSES	**5,012**	**6,563**	**7,533**	**8,322**	**8,873**	**8,400**	**8,452**	**8,537**	**8,616**	**8,680**
NET CASH FARM INCOME	**-4,452**	**-3,203**	**-1,933**	**2,878**	**7,927**	**11,760**	**15,068**	**16,103**	**16,024**	**15,960**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**-4,452**	**-3,203**	**-1,933**	**2,878**	**7,927**	**11,760**	**15,068**	**16,103**	**16,024**	**15,960**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	70	420	700	1,400	2,100	2,520	2,940	3,080	3,080	3,080
CASH EXPENSES ($/ACRE)	626	820	942	1,040	1,109	1,050	1,056	1,067	1,077	1,085
NET CASH INCOME ($/ACRE)	-557	-400	-242	360	991	1,470	1,884	2,013	2,003	1,995

Table 28A - 2 - B. Valencia Oranges, Microjet Spray Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**0**	**0**	**0**	**0**	**1,217**	**12,996**	**28,270**	**44,831**	**61,600**
PLUS:										
NET CASH FARM INCOME	-4,452	-3,203	-1,933	2,878	7,927	11,760	15,068	16,103	16,024	15,960
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	0	0	0	0	19	205	458	744	1,047
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**-4,452**	**-3,203**	**-1,933**	**2,878**	**7,927**	**12,996**	**28,270**	**44,831**	**61,600**	**78,607**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	4,452	7,655	9,588	6,710	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**4,452**	**7,655**	**9,588**	**6,710**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	-4,452	-7,655	-9,588	-6,710	1,217	12,996	28,270	44,831	61,600	78,607
ENDING YEAR CASH RESERVE	**0**	**0**	**0**	**0**	**1,217**	**12,996**	**28,270**	**44,831**	**61,600**	**78,607**

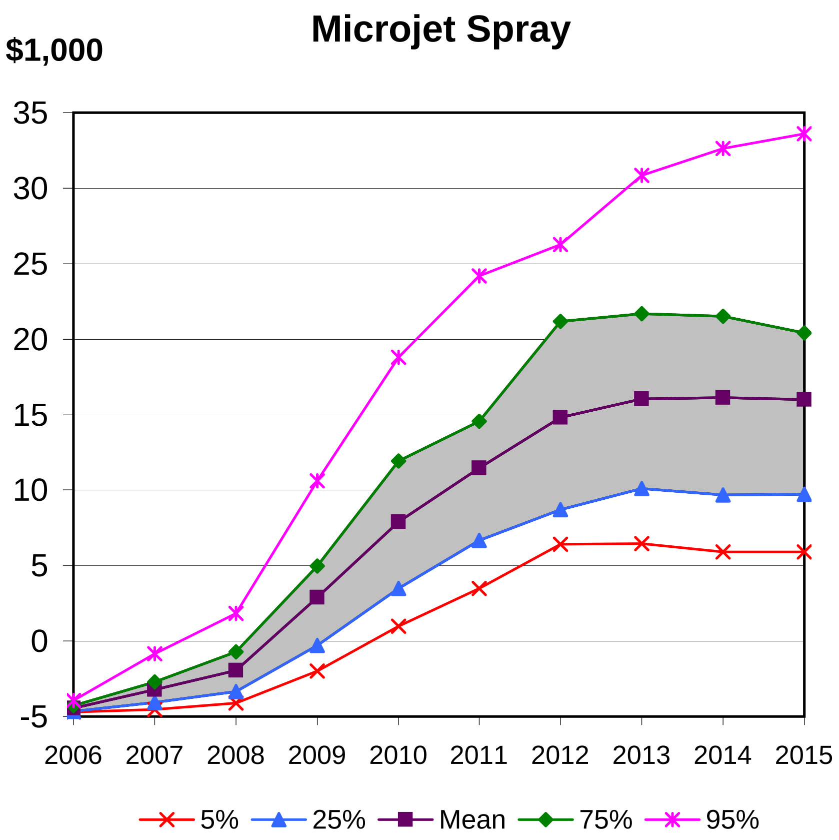
Table 28A-3. Valencia Oranges, Microjet Spray Irrigation Demonstration

	Microjet Spray
Total Cash Receipts ($1000)	
2006	0.56
2007	3.34
2008	5.60
2009	11.20
2010	16.79
2011	20.05
2012	23.31
2013	24.56
2014	24.74
2015	24.67
2006-2015 Average	**15.48**
Total Cash Costs ($1000)	
2006	5.01
2007	6.56
2008	7.53
2009	8.32
2010	8.90
2011	8.61
2012	8.48
2013	8.54
2014	8.62
2015	8.68
2006-2015 Average	**7.93**
Net Cash Farm Income ($1000)	
2006	-4.45
2007	-3.22
2008	-1.93
2009	2.88
2010	7.90
2011	11.44
2012	14.83
2013	16.02
2014	16.13
2015	15.99
2006-2015 Average	**7.56**
Prob. Net Cash Income < Zero (%)	
2006	99.00
2007	98.00
2008	84.00
2009	30.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**31.20**

Table 28A-3. Valencia Oranges, Microjet Spray Irrigation Demonstration

	Microjet Spray
Ending Cash Reserves ($1000)	
2006	-4.45
2007	-7.68
2008	-9.61
2009	-6.73
2010	1.17
2011	12.67
2012	27.71
2013	44.17
2014	61.03
2015	78.06
2006-2015 Average	**19.63**
Prob. of Ending Cash Reserves < Zero (%)	
2006	99.00
2007	99.00
2008	99.00
2009	91.00
2010	48.00
2011	10.00
2012	2.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**45.10**
Average Annual Operating Expense/Receipts	
2006	10.29
2007	2.05
2008	1.37
2009	0.76
2010	0.55
2011	0.46
2012	0.39
2013	0.38
2014	0.39
2015	0.39
2006-2015 Average	**1.70**

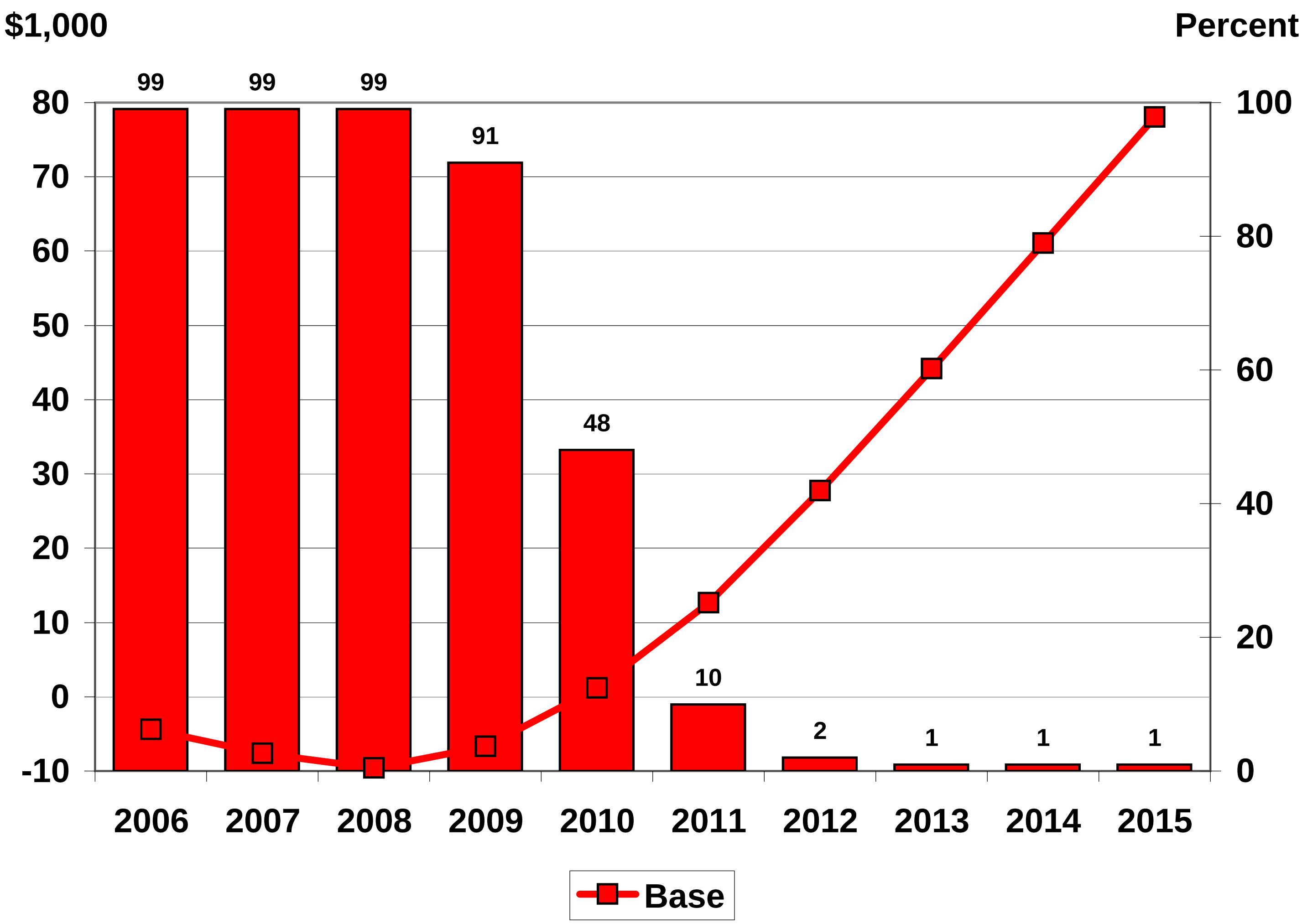
Figure 28A-1. Projected Variability in Net Cash Farm Income for Valencia Oranges, Microjet Spray Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 28A-2. Ending Cash Reserves and Probability of Having to Refinance Operating Note for Valencia Oranges, Microjet Spray Irrigation Demonstration.



Demonstration Site 28C: Rio Red Grapefruit, Microjet Spray Irrigation

The basic costs of production assumptions for the Rio Red grapefruit demonstration are given in Table 28C-1. For the purpose of presenting economic viability and outlook for the 8-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 8 acres of microjet spray irrigation Rio Red grapefruit production. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $150/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the microjet spray irrigation is provided in Table 28C-2-A, followed by a cash flow summary (Table 28C-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 28C-3 and Figure

28C-1. Table 28C-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $26,370 over the 10-year period and cash costs average $9,380. NCFI averages $17,000 due largely to the price being held at a constant $150/ton (Table 28C-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $6,000 to $35,000 for the site (Figure 28C-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $182,860 by 2015 (Table 28C-3). The average cash flow balances (Table 28C-3) are intended to illustrate the cash requirements or flows generated using the microjet spray irrigation method.

Table 28C-1. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Rio Red Grapefruit
PLANTED ACRES	8
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	22
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	150
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	85
HERBICIDES	100
INSECTICIDES	310
FUNGICIDES	40
CUSTOM APPLICATION	90
SCOUTING / OTHER	0
IRRIGATION FUEL	110
TILLAGE/HARVST FUEL	0
HARVESTING, HAULING, DRYING & CHECKOFF:	
$/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	79
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	150
PREMIUM RATE ($/ACRE)	110
PREMIUM COSTS	880

Table 28C - 2 - A. Rio Red Grapefruit, Microjet Spray Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	26,400	26,400	26,400	26,400	26,400	26,400	26,400	26,400	26,400	26,400
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**	**26,400**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	680	684	676	669	678	684	688	700	710	718
HERBICIDE COSTS	800	798	788	795	803	811	819	830	838	844
INSECTICIDE COSTS	2,480	2,445	2,385	2,419	2,461	2,501	2,539	2,576	2,600	2,614
FUNGICIDE COSTS	320	324	324	329	333	337	341	345	349	352
CUSTOM APPLICATION	720	710	669	647	629	616	609	617	626	636
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	880	868	818	791	769	753	745	754	766	777
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	880	880	880	880	880	880	880	880	880	880
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	632	651	672	691	708	726	745	762	781	799
SUB-TOTAL OF PROD COSTS	7,392	7,360	7,213	7,221	7,262	7,308	7,366	7,462	7,550	7,619
CASH RENT FOR CROPLAND	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Microjet Sys	800	800	800	800	800	800	800	800	800	800
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	9,392	9,360	9,213	9,221	9,262	9,308	9,366	9,462	9,550	9,619
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**9,392**	**9,360**	**9,213**	**9,221**	**9,262**	**9,308**	**9,366**	**9,462**	**9,550**	**9,619**
NET CASH FARM INCOME	**17,008**	**17,040**	**17,187**	**17,179**	**17,138**	**17,092**	**17,034**	**16,938**	**16,850**	**16,781**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**17,008**	**17,040**	**17,187**	**17,179**	**17,138**	**17,092**	**17,034**	**16,938**	**16,850**	**16,781**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
CASH EXPENSES ($/ACRE)	1,174	1,170	1,152	1,153	1,158	1,164	1,171	1,183	1,194	1,202
NET CASH INCOME ($/ACRE)	2,126	2,130	2,148	2,147	2,142	2,136	2,129	2,117	2,106	2,098

Table 28C - 2 - B. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**17,008**	**34,308**	**52,007**	**69,982**	**88,191**	**106,650**	**125,368**	**144,337**	**163,583**
PLUS:										
NET CASH FARM INCOME	17,008	17,040	17,187	17,179	17,138	17,092	17,034	16,938	16,850	16,781
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	260	511	796	1,071	1,367	1,685	2,031	2,396	2,781
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**17,008**	**34,308**	**52,007**	**69,982**	**88,191**	**106,650**	**125,368**	**144,337**	**163,583**	**183,145**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	17,008	34,308	52,007	69,982	88,191	106,650	125,368	144,337	163,583	183,145
ENDING YEAR CASH RESERVE	**17,008**	**34,308**	**52,007**	**69,982**	**88,191**	**106,650**	**125,368**	**144,337**	**163,583**	**183,145**

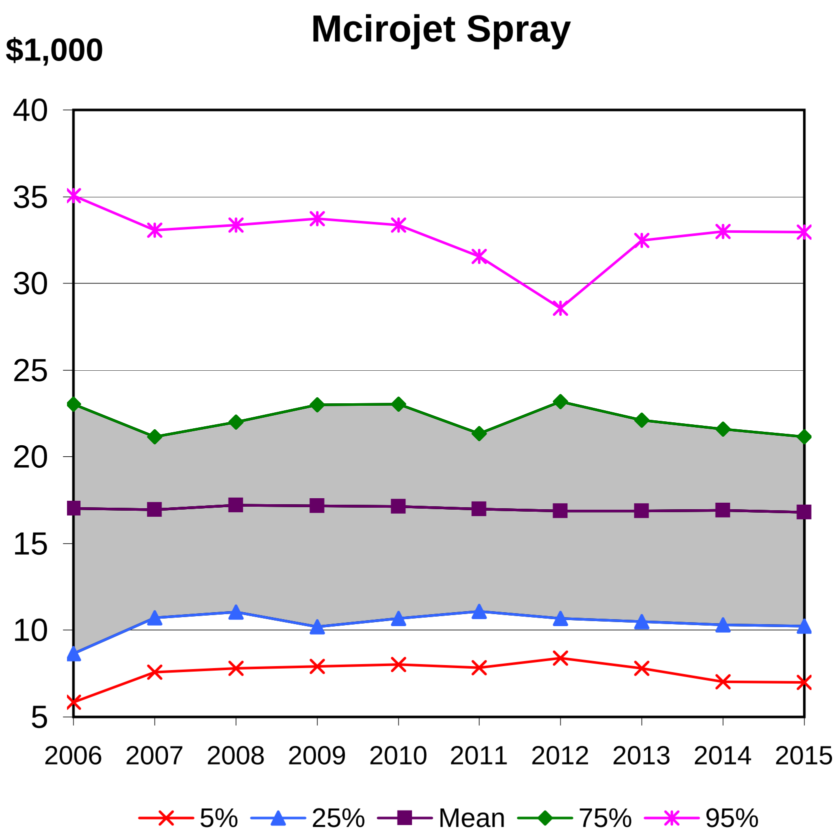
Table 28C-3. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

	Microjet Spray
Total Cash Receipts ($1000)	
2006	26.43
2007	26.31
2008	26.41
2009	26.39
2010	26.40
2011	26.30
2012	26.26
2013	26.34
2014	26.47
2015	26.42
2006-2015 Average	**26.37**
Total Cash Costs ($1000)	
2006	9.39
2007	9.36
2008	9.21
2009	9.22
2010	9.26
2011	9.31
2012	9.37
2013	9.46
2014	9.55
2015	9.62
2006-2015 Average	**9.38**
Net Cash Farm Income ($1000)	
2006	17.04
2007	16.95
2008	17.20
2009	17.17
2010	17.13
2011	16.99
2012	16.89
2013	16.88
2014	16.92
2015	16.80
2006-2015 Average	**17.00**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 28C-3. Rio Red Grapefruit, Microjet Spray Irrigation Demonstration

	Microjet Spray
Ending Cash Reserves ($1000)	
2006	17.04
2007	34.25
2008	51.96
2009	69.92
2010	88.12
2011	106.48
2012	125.05
2013	143.96
2014	163.28
2015	182.86
2006-2015 Average	**98.29**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.40
2007	0.38
2008	0.38
2009	0.38
2010	0.38
2011	0.38
2012	0.38
2013	0.39
2014	0.39
2015	0.40
2006-2015 Average	**0.39**

Figure 28C-1. Projected Variability in Net Cash Farm Income for Rio Red Grapefruit, Microjet Spray Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 28D: Early Oranges (Marrs & Navel), 2-Line Drip Irrigation

The basic costs of production assumptions for the early orange (Marrs & Navel) 2-line drip demonstration are given in Table 28D-1. For the purpose of presenting economic viability and outlook for the 7-acre site (3.5 acres of Marrs & 3.5 acres Navel), production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 7 acres of 2-line drip irrigation early orange production. The orchard was assumed to have mature trees. The early orange price is held constant at $115/ton. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a 2-line drip system at a cost of $1,000 per acre. The 2-line drip system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the 2-line drip irrigation is provided in Table 28D-2-A, followed by a cash flow summary (Table 28D-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 28D-3 and Figure

28D-1. Table 28D-3 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $12,850 over the 10-year period and cash costs average $6,460. NCFI averages $6,390 due largely to the price being held at a constant $115/ton (Table 28D-3). The risk associated with prices and yields suggests a small chance of negative NCFI. In a normal production year, NCFI could range as much as -$1,000 to $18,000 for the site (Figure 28D-1). Cash reserves are expected to grow throughout the 10-year projection period and reach $68,770 by 2015 (Table 28D-3). The average cash flow balances (Table 28D-3) are intended to illustrate the cash requirements or flows generated using the 2-line drip irrigation method.

Table 28D-1. Early Season Oranges (Marrs & Navel), 2-Line Drip Irrrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Early Orange
PLANTED ACRES	7
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	16
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	115
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	85
HERBICIDES	100
INSECTICIDES	210
FUNGICIDES	40
CUSTOM APPLICATION	25
SCOUTING / OTHER	0
IRRIGATION FUEL	110
TILLAGE/HARVST FUEL	0
HARVESTING, HAULING, DRYING & CHECKOFF:	
$/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	0
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.5
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	150
PREMIUM RATE ($/ACRE)	110
PREMIUM COSTS	770

Table 28D - 2 - A. Early Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	12,880	12,880	12,880	12,880	12,880	12,880	12,880	12,880	12,880	12,880
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**	**12,880**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	595	598	592	585	593	598	602	612	621	628
HERBICIDE COSTS	700	698	690	696	702	710	717	726	733	739
INSECTICIDE COSTS	1,470	1,449	1,414	1,434	1,459	1,483	1,505	1,527	1,541	1,549
FUNGICIDE COSTS	280	284	284	288	292	295	298	302	305	308
CUSTOM APPLICATION	175	173	163	157	153	150	148	150	152	155
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	770	759	715	692	673	659	652	659	670	680
FUEL & LUBE COSTS	0	0	0	0	0	0	0	0	0	0
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	770	770	770	770	770	770	770	770	770	770
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF PROD COSTS	4,760	4,731	4,627	4,622	4,642	4,664	4,692	4,746	4,793	4,828
CASH RENT FOR CROPLAND	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Drip 2 lines	700	700	700	700	700	700	700	700	700	700
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	6,510	6,481	6,377	6,372	6,392	6,414	6,442	6,496	6,543	6,578
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**6,510**	**6,481**	**6,377**	**6,372**	**6,392**	**6,414**	**6,442**	**6,496**	**6,543**	**6,578**
NET CASH FARM INCOME	**6,370**	**6,399**	**6,503**	**6,508**	**6,488**	**6,466**	**6,438**	**6,384**	**6,337**	**6,302**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**6,370**	**6,399**	**6,503**	**6,508**	**6,488**	**6,466**	**6,438**	**6,384**	**6,337**	**6,301**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840
CASH EXPENSES ($/ACRE)	930	926	911	910	913	916	920	928	935	940
NET CASH INCOME ($/ACRE)	910	914	929	930	927	924	920	912	905	900

Table 28D - 2 - B. Early Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**6,370**	**12,866**	**19,561**	**26,368**	**33,260**	**40,241**	**47,316**	**54,466**	**61,707**
PLUS:										
NET CASH FARM INCOME	6,370	6,399	6,503	6,508	6,488	6,466	6,438	6,384	6,337	6,302
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	97	192	299	403	516	636	767	904	1,049
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**6,370**	**12,866**	**19,561**	**26,368**	**33,260**	**40,241**	**47,316**	**54,466**	**61,707**	**69,058**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	6,370	12,866	19,561	26,368	33,260	40,241	47,316	54,466	61,707	69,058
ENDING YEAR CASH RESERVE	**6,370**	**12,866**	**19,561**	**26,368**	**33,260**	**40,241**	**47,316**	**54,466**	**61,707**	**69,058**

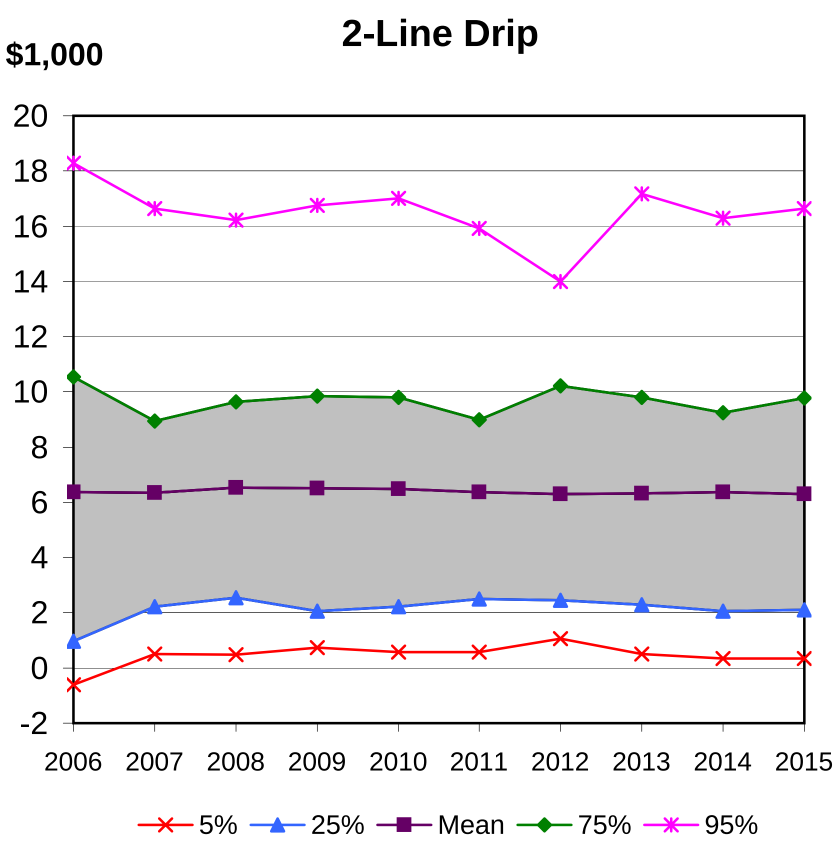
Table 28D-3. Early Season Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration

	2-Line Drip
Total Cash Receipts ($1000)	
2006	12.89
2007	12.83
2008	12.90
2009	12.87
2010	12.88
2011	12.79
2012	12.74
2013	12.83
2014	12.92
2015	12.88
2006-2015 Average	**12.85**
Total Cash Costs ($1000)	
2006	6.51
2007	6.49
2008	6.38
2009	6.37
2010	6.39
2011	6.41
2012	6.44
2013	6.50
2014	6.54
2015	6.58
2006-2015 Average	**6.46**
Net Cash Farm Income ($1000)	
2006	6.38
2007	6.35
2008	6.52
2009	6.50
2010	6.49
2011	6.38
2012	6.30
2013	6.33
2014	6.38
2015	6.31
2006-2015 Average	**6.39**
Prob. Net Cash Income < Zero (%)	
2006	15.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	2.00
2014	4.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**2.60**

Table 28D-3. Early Season Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration

	2-Line Drip
Ending Cash Reserves ($1000)	
2006	6.38
2007	12.83
2008	19.54
2009	26.34
2010	33.23
2011	40.12
2012	47.05
2013	54.15
2014	61.42
2015	68.77
2006-2015 Average	**36.98**
Prob. of Ending Cash Reserves < Zero (%)	
2006	15.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.60**
Average Annual Operating Expense/Receipts	
2006	0.63
2007	0.58
2008	0.57
2009	0.57
2010	0.57
2011	0.57
2012	0.57
2013	0.58
2014	0.59
2015	0.59
2006-2015 Average	**0.58**

Figure 28D-1. Projected Variability in Net Cash Farm Income for Early Season Oranges (Marrs & Navel), 2-Line Drip Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 41: Cotton, Surge Irrigation

The basic costs of production assumptions for the cotton surge demonstration are given in Table 41-1. For the purpose of presenting economic viability and outlook for the 38.5-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38.5 acres of surge irrigation cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.59/lb., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a surge valve at a cost of $1,800. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the surge irrigation is provided in Table 41-2-A, followed by a cash flow summary (Table 41-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 41-3 and Figure 41-1. Table 41-3

presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $33,800 over the 10-year period and cash costs average just under $22,000. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. NCFI increases throughout the 10-year period from $8,790 in 2006 to over $14,000 in 2015 (Table 41-3). The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI (Figure 41-1) could range as much as $8,000 plus or minus the average expected NCFI for the site. Cash reserves are expected to grow throughout the 10-year projection period and reach $121,650 by 2015 (Table 41-3). The average cash flow balances (Table 41-3) are intended to illustrate the cash requirements or flows generated using the surge irrigation method.

Table 41-1. Cotton, Surge Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr
PLANTED ACRES	38.5	38.5
BASE ACRES	35	0
YIELD UNITS	lb	ton
BUDGETING YIELD	1047	0.79
FARM PROG YLD DIR	650	0
FARM PROG YLD CCP	650	0
PRICES/YIELD UNIT	0.51	95.81
VARIABLE PRODUCTION COSTS ($/ACRE)		
SEED	18	0
FERTILIZER	26	0
HERBICIDES	15	0
INSECTICIDES	65	0
FUNGICIDES	0	0
CUSTOM APPLICATION	3.5	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	53	0
TILLAGE/HARVST FUEL	36	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.13	0
HARVEST COST/ACRE	94	0
BOLL WEEVIL COST/ACRE	28	0
LABOR COST /ACRE	20	0
CROP INSURANCE		
YIELD ELECTION (FRACTION)	0.65	0
YIELD COVERAGE GUARANTEE	633.75	0
PRICE ELECTION (FRACTION)	1	0
PRICE GUARANTEE	0.5115	0
PREMIUM RATE ($/ACRE)	8.25	0
PREMIUM COSTS	317.625	0

Table 41-2-A. Cotton, Surge Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	23,472	24,726	26,198	26,732	27,205	28,131	28,576	28,992	29,428	29,838
DECOUPLED DIRECT PAYMENTS	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290
DECOUPLED CCPs	2,654	2,562	2,296	2,071	1,977	1,971	1,902	1,822	1,811	1,805
MARKETING LOAN PAYMENTS	3,848	3,150	2,729	2,491	2,562	2,511	2,345	2,333	2,395	2,348
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**31,264**	**31,727**	**32,513**	**32,584**	**33,033**	**33,904**	**34,112**	**34,437**	**34,924**	**35,281**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	693	703	694	701	711	722	729	738	745	751
FERTILIZER COSTS	1,001	1,007	996	984	998	1,006	1,013	1,030	1,046	1,056
HERBICIDE COSTS	578	576	569	574	580	585	591	599	605	610
INSECTICIDE COSTS	2,502	2,467	2,407	2,441	2,484	2,524	2,563	2,599	2,624	2,637
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	135	133	125	121	118	115	114	115	117	119
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	2,040	2,013	1,896	1,834	1,784	1,746	1,727	1,747	1,775	1,802
FUEL & LUBE COSTS	1,386	1,367	1,288	1,246	1,212	1,186	1,173	1,187	1,206	1,224
HARVESTING COSTS	8,859	8,818	8,384	8,186	8,036	7,938	7,926	8,096	8,305	8,509
CROP INSURANCE PREMIUMS	318	318	318	318	318	318	318	318	318	318
BOLL WEEVIL COSTS	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078	1,078
HIRED LABOR COSTS	770	793	819	842	862	885	908	929	951	973
SUB-TOTAL OF PROD COSTS	19,360	19,272	18,573	18,325	18,179	18,104	18,138	18,436	18,769	19,077
CASH RENT FOR CROPLAND	2,888	2,888	2,888	2,888	2,888	2,888	2,888	2,888	2,888	2,888
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Surge Valve	180	180	180	180	180	180	180	180	180	180
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	22,428	22,340	21,641	21,392	21,247	21,171	21,206	21,503	21,836	22,144
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	7	2	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**22,428**	**22,346**	**21,642**	**21,392**	**21,247**	**21,171**	**21,206**	**21,503**	**21,836**	**22,144**
NET CASH FARM INCOME	**8,836**	**9,381**	**10,871**	**11,192**	**11,787**	**12,732**	**12,906**	**12,934**	**13,087**	**13,137**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**8,836**	**9,381**	**10,871**	**11,192**	**11,787**	**12,732**	**12,906**	**12,934**	**13,087**	**13,136**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	812	824	844	846	858	881	886	894	907	916
CASH EXPENSES ($/ACRE)	583	580	562	556	552	550	551	559	567	575
NET CASH INCOME ($/ACRE)	230	244	282	291	306	331	335	336	340	341

Table 41-2-B. Cotton, Surge Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**8,836**	**18,218**	**29,092**	**40,289**	**52,085**	**64,838**	**77,788**	**90,802**	**104,017**
PLUS:										
NET CASH FARM INCOME	8,836	9,381	10,871	11,192	11,787	12,732	12,906	12,934	13,087	13,137
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	1	3	6	9	21	43	80	128	186
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**8,836**	**18,218**	**29,092**	**40,289**	**52,085**	**64,838**	**77,788**	**90,802**	**104,017**	**117,340**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	8,836	18,218	29,092	40,289	52,085	64,838	77,788	90,802	104,017	117,340
ENDING YEAR CASH RESERVE	**8,836**	**18,218**	**29,092**	**40,289**	**52,085**	**64,838**	**77,788**	**90,802**	**104,017**	**117,340**

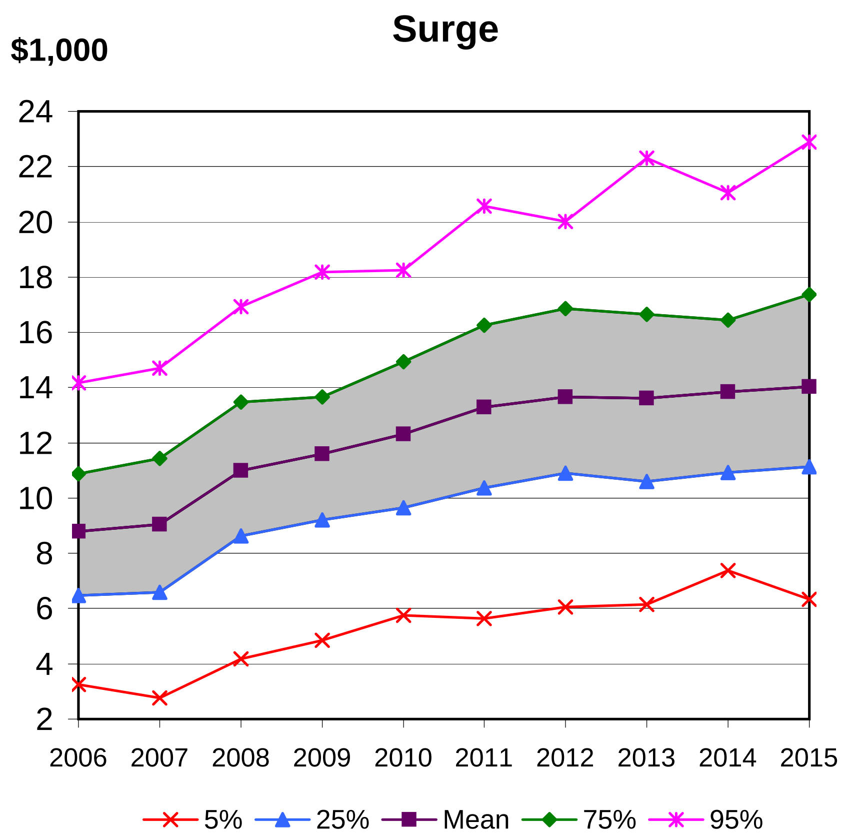
Table 41-3. Cotton, Surge Irrigation Demonstration

	Surge
Total Cash Receipts ($1000)	
2006	31.21
2007	31.38
2008	32.65
2009	33.00
2010	33.56
2011	34.44
2012	34.90
2013	35.09
2014	35.67
2015	36.20
2006-2015 Average	**33.81**
Total Cash Costs ($1000)	
2006	22.43
2007	22.34
2008	21.65
2009	21.40
2010	21.26
2011	21.17
2012	21.23
2013	21.48
2014	21.83
2015	22.16
2006-2015 Average	**21.69**
Net Cash Farm Income ($1000)	
2006	8.79
2007	9.04
2008	11.00
2009	11.60
2010	12.31
2011	13.28
2012	13.67
2013	13.61
2014	13.84
2015	14.04
2006-2015 Average	**12.12**
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**

Table 41-3. Cotton, Surge Irrigation Demonstration

	Surge
Ending Cash Reserves ($1000)	
2006	8.79
2007	17.83
2008	28.83
2009	40.43
2010	52.75
2011	66.05
2012	79.76
2013	93.45
2014	107.42
2015	121.65
2006-2015 Average	**61.69**
Prob. of Ending Cash Reserves < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.73
2007	0.72
2008	0.67
2009	0.66
2010	0.64
2011	0.63
2012	0.62
2013	0.62
2014	0.62
2015	0.62
2006-2015 Average	**0.65**

Figure 41-1. Projected Variability in Net Cash Farm Income for Cotton, Surge Irrigation Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Sites 42A & 42B: Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe

The basic costs of production assumptions for the cotton and grain sorghum surge irrigation with poly-pipe demonstration are given in Tables 42-1 and 42-2. For the purpose of presenting economic viability and outlook for the 94-acre cotton and 66-acre grain sorghum sites, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 94 acres of cotton and 66 acres of grain sorghum production. It is assumed the cotton and grain sorghum acreage is rotated annually. The analysis assumes a $1,800 cost for a surge valve. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing cost. The initial cotton price is $.56/lb. and the grain sorghum price is $5.00/cwt., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the baseline is provided in Table 42-3-A, followed by a cash flow summary (Table 42-3-B). The income and cash flow statement results from the simplistic (no risk) forecast assuming average prices and yields. Tables 42-4-1 and 42-4-2 give revenue and expense summaries for the two individual crops. A more comprehensive projection, including price and yield risk, is illustrated in Table 42-5 and Figures 42-1 & 42-2. Table 42-5 presents the average outcomes for selected financial projections, while the graphical presentations illustrate the full range of possibilities for Net Cash Farm Income (NCFI) and cash flow requirements. Total cash receipts average just over $92,000 initially and fluctuate from year-to-year as planted acreages rotate from cotton to grain sorghum production. Peak cash receipt years reflect those years where cotton plantings are the highest. In addition to market receipts, total receipts for the 160 acres include direct and counter-cyclical payments paid to base acres. Cash costs also reflect the cotton to grain sorghum rotation cycle, requiring roughly $65,270 in the initial year and $56,020 in 2007. NCFI generally follows the cotton to grain sorghum rotation cycle producing $27,690 profit in the initial year and averages $27,680 over the 10-year period. The risk associated with prices and yields suggests that, in a normal production year, NCFI (Figure 42-1) could range as much as $14,000 to $16,000 plus or minus the average expected NCFI. Cash reserves are expected to grow throughout the 10-year projection period Figure 42-2. The average cash flow balances (Figure 42-2) are intended to illustrate the cash requirements or positive flows generated by the crop enterprises.

Table 42-1. Cotton, Surge Irrigation with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr	Y Corn Irr
PLANTED ACRES	94	94	0
BASE ACRES	112.22	0	3.07
YIELD UNITS	lb	ton	bu
BUDGETING YIELD	1000	0.75	0
FARM PROG YLD DIR	668	0	96
FARM PROG YLD CCP	668	0	96
PRICES/YIELD UNIT	0.44	99.07	2.1
VARIABLE PRODUCTION COSTS ($/ACRE)			
SEED	22.5	0	0
FERTILIZER	88.13	0	0
HERBICIDES	5.07	0	0
INSECTICIDES	0	0	0
FUNGICIDES	0	0	0
CUSTOM APPLICATION	50.74	0	0
SCOUTING / OTHER	0	0	0
IRRIGATION FUEL	48.44	0	0
TILLAGE/HARVST FUEL	10.74	0	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.21	0	0
HARVEST COST/ACRE	13	0	0
BOLL WEEVIL COST/ACRE	28	0	0
LABOR COST /ACRE	38.89	0	0
CROP INSURANCE			
YIELD ELECTION (FRACTION)	0.65	0	0
YIELD COVERAGE GUARANTEE	664.625	0	0
PRICE ELECTION (FRACTION)	1	0	0
PRICE GUARANTEE	0.4788	0	0
PREMIUM RATE ($/ACRE)	12.3	0	0
PREMIUM COSTS	1156.2001	0	0

Table 42-2. Grain Sorghum, Surge Irrigaiton with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Sorghm Irr
PLANTED ACRES	66
BASE ACRES	11.2
YIELD UNITS	cwt
BUDGETING YIELD	60
FARM PROG YLD DIR	36.96
FARM PROG YLD CCP	36.96
PRICES/YIELD UNIT	4.68
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	13.26
FERTILIZER	48.87
HERBICIDES	3.85
INSECTICIDES	0
FUNGICIDES	0
CUSTOM APPLICATION	27.21
SCOUTING / OTHER	0
IRRIGATION FUEL	49.09
TILLAGE/HARVST FUEL	5.01
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.6
HARVEST COST/ACRE	8.3
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	34.18
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.65
YIELD COVERAGE GUARANTEE	39.1625
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	3.4373
PREMIUM RATE ($/ACRE)	9
PREMIUM COSTS	594

Table 42 - 3 - A. Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstratio

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	66,877	62,963	71,833	65,479	74,279	68,296	77,325	70,510	78,894	71,058
DECOUPLED DIRECT PAYMENTS	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540	4,540
DECOUPLED CCPs	9,003	8,967	8,921	8,811	8,447	7,796	7,147	6,541	6,182	6,109
MARKETING LOAN PAYMENTS	12,790	8,011	9,269	5,870	7,474	4,720	5,940	3,736	5,251	3,632
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**93,210**	**84,481**	**94,563**	**84,700**	**94,741**	**85,351**	**94,953**	**85,328**	**94,867**	**85,339**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	2,990	2,769	3,067	2,849	3,168	2,945	3,275	3,032	3,367	3,119
FERTILIZER COSTS	11,510	10,070	10,834	9,907	11,174	10,344	11,666	10,752	12,093	11,127
HERBICIDE COSTS	731	689	719	691	732	708	755	730	776	750
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	6,565	5,734	6,209	5,638	6,350	5,809	6,558	5,993	6,783	6,215
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	7,793	7,583	7,370	7,456	7,537	7,683	7,785	7,926	8,052	8,219
FUEL & LUBE COSTS	1,340	1,145	1,267	1,126	1,296	1,160	1,339	1,197	1,385	1,241
HARVESTING COSTS	23,886	18,387	22,732	18,195	23,397	18,868	24,320	19,588	25,316	20,444
CROP INSURANCE PREMIUMS	1,750	1,658	1,750	1,658	1,750	1,658	1,750	1,658	1,750	1,658
BOLL WEEVIL COSTS	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848
HIRED LABOR COSTS	5,912	5,932	6,231	6,244	6,551	6,576	6,913	6,941	7,299	7,342
SUB-TOTAL OF PROD COSTS	65,109	55,815	62,811	55,609	64,588	57,599	66,993	59,664	69,453	61,963
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
OTHEREXPENSE	180	180	180	180	180	180	180	180	180	180
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	65,289	55,995	62,991	55,789	64,768	57,779	67,173	59,844	69,633	62,143
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	11	6	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**65,289**	**56,006**	**62,997**	**55,789**	**64,768**	**57,779**	**67,173**	**59,844**	**69,633**	**62,143**
NET CASH FARM INCOME	**27,921**	**28,475**	**31,566**	**28,911**	**29,972**	**27,572**	**27,780**	**25,484**	**25,235**	**23,196**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**27,921**	**28,475**	**31,566**	**28,911**	**29,972**	**27,572**	**27,780**	**25,484**	**25,235**	**23,195**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	583	528	591	529	592	533	593	533	593	533
CASH EXPENSES ($/ACRE)	408	350	394	349	405	361	420	374	435	388
NET CASH INCOME ($/ACRE)	175	178	197	181	187	172	174	159	158	145

Table 42 - 3 - B. Cotton & Grain Sorghum, Surge Irrigaiton with Poly-Pipe Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**27,921**	**56,400**	**87,983**	**116,942**	**147,024**	**174,809**	**202,900**	**228,850**	**254,725**
PLUS:										
NET CASH FARM INCOME	27,921	28,475	31,566	28,911	29,972	27,572	27,780	25,484	25,235	23,196
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	4	17	48	110	213	311	467	640	872
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**27,921**	**56,400**	**87,983**	**116,942**	**147,024**	**174,809**	**202,900**	**228,850**	**254,725**	**278,794**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	27,921	56,400	87,983	116,942	147,024	174,809	202,900	228,850	254,725	278,794
ENDING YEAR CASH RESERVE	**27,921**	**56,400**	**87,983**	**116,942**	**147,024**	**174,809**	**202,900**	**228,850**	**254,725**	**278,794**

Table 42 - 4 - 1. Cotton, Surge Irrigation with Poly-Pipe Demonstration

REVENUE AND EXPENSE SUMMARY.

Cotton

YEARS 2006 - 2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
UNIT 1. INCOME (NET OF SHARE LEASE)										
VALUE OF CROPS PRODUCED	48,344	35,900	52,281	36,898	53,774	38,636	56,300	40,337	57,627	40,597
DIRECT PAYMENTS	4,320	4,320	4,320	4,320	4,320	4,320	4,320	4,320	4,320	4,320
COUNTER-CYCLICAL PAYMENTS	8,833	8,805	8,786	8,715	8,388	7,765	7,134	6,538	6,182	6,109
MARKETING LOAN PAYMENTS	11,524	6,745	8,790	5,761	7,474	4,720	5,940	3,736	5,251	3,632
CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
OTHER ANNUAL FARM INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL UNIT REVENUE	**73,022**	**55,770**	**74,177**	**55,694**	**73,956**	**55,441**	**73,695**	**54,931**	**73,380**	**54,658**
UNIT EXPENSES (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	2,115	1,506	2,169	1,549	2,241	1,601	2,317	1,648	2,381	1,696
FERTILIZER COSTS	8,284	5,626	7,798	5,535	8,043	5,780	8,396	6,007	8,704	6,217
HERBICIDE COSTS	477	331	469	332	478	340	492	350	506	360
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATIONS	4,770	3,251	4,510	3,196	4,613	3,294	4,764	3,398	4,928	3,524
SCOUTING / OTHER COSTS	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	4,553	3,103	4,306	3,051	4,404	3,144	4,548	3,244	4,704	3,364
FUEL & LUBE COSTS	1,010	688	955	677	976	697	1,008	719	1,043	746
HARVESTING COSTS	20,962	14,333	19,950	14,183	20,534	14,708	21,345	15,271	22,219	15,939
CROP INSURANCE PREMIUMS	1,156	812	1,156	812	1,156	812	1,156	812	1,156	812
BOLL WEEVIL PROGRAM COSTS	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848	2,632	1,848
HIRED LABOR	3,656	2,635	3,853	2,773	4,051	2,920	4,275	3,082	4,514	3,261
SUB-TOTAL CROP EXPENSES	49,614	34,132	47,798	33,956	49,128	35,145	50,935	36,380	52,788	37,766
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT STATE/PRIVATE PASTURE	0	0	0	0	0	0	0	0	0	0
RENT STOCKER PASTURE	0	0	0	0	0	0	0	0	0	0
UNIT EXPENSES	**49,614**	**34,132**	**47,798**	**33,956**	**49,128**	**35,145**	**50,935**	**36,380**	**52,788**	**37,766**
UNIT CONTRIBUTION TO UNALLOCATED OVERHEAD/FIXED COSTS	**23,407**	**21,638**	**26,378**	**21,739**	**24,828**	**20,296**	**22,760**	**18,551**	**20,592**	**16,893**
ALLOCATION OF OVERHEAD EXPENSES										
HIRED LABOR	0	0	0	0	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
OTHER FARM EXPENSES	141	119	141	118	141	117	140	116	139	115
CROP STORAGE COSTS	0	0	0	0	0	0	0	0	0	0
CONSERVATION & ENVIRONMENT	0	0	0	0	0	0	0	0	0	0
INTEREST COST LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST COST INTERMEDIATE	0	0	0	0	0	0	0	0	0	0
INTEREST COST OPERATING DEBT	0	7	5	0	0	0	0	0	0	0
INTEREST COST CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	0	0	0	0	0	0
TOTAL ALLOCATED EXPENSES	**141**	**126**	**146**	**118**	**141**	**117**	**140**	**116**	**139**	**116**
UNIT NET INCOME	**23,266**	**21,512**	**26,233**	**21,620**	**24,688**	**20,179**	**22,620**	**18,435**	**20,453**	**16,777**

Table 42 - 4 - 2. Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstration

REVENUE AND EXPENSE SUMMARY.

Grain Sorghum

YEARS 2006 - 2015	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
UNIT 2. INCOME (NET OF SHARE LEASE)										
VALUE OF CROPS PRODUCED	18,533	27,063	19,553	28,581	20,506	29,660	21,025	30,173	21,268	30,461
DIRECT PAYMENTS	220	220	220	220	220	220	220	220	220	220
COUNTER-CYCLICAL PAYMENTS	170	162	135	95	59	30	13	3	0	0
MARKETING LOAN PAYMENTS	1,266	1,266	478	109	0	0	0	0	0	0
CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
OTHER ANNUAL FARM INCOME	0	0	0	0	0	0	0	0	0	0
TOTAL UNIT REVENUE	**20,189**	**28,711**	**20,386**	**29,006**	**20,785**	**29,911**	**21,258**	**30,396**	**21,488**	**30,681**
UNIT EXPENSES (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	875	1,264	898	1,300	927	1,344	959	1,384	985	1,423
FERTILIZER COSTS	3,225	4,444	3,036	4,372	3,131	4,565	3,269	4,744	3,389	4,910
HERBICIDE COSTS	254	358	250	359	255	368	263	379	270	390
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATIONS	1,796	2,483	1,698	2,441	1,737	2,516	1,794	2,595	1,855	2,691
SCOUTING / OTHER COSTS	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	3,240	4,479	3,064	4,404	3,133	4,538	3,236	4,682	3,347	4,855
FUEL & LUBE COSTS	331	457	313	449	320	463	330	478	342	496
HARVESTING COSTS	2,924	4,055	2,782	4,012	2,863	4,159	2,975	4,317	3,097	4,505
CROP INSURANCE PREMIUMS	594	846	594	846	594	846	594	846	594	846
BOLL WEEVIL PROGRAM COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR	2,256	3,298	2,378	3,471	2,500	3,656	2,638	3,858	2,786	4,082
SUB-TOTAL CROP EXPENSES	15,495	21,683	15,012	21,654	15,460	22,454	16,058	23,284	16,665	24,198
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT STATE/PRIVATE PASTURE	0	0	0	0	0	0	0	0	0	0
RENT STOCKER PASTURE	0	0	0	0	0	0	0	0	0	0
UNIT EXPENSES	**15,495**	**21,683**	**15,012**	**21,654**	**15,460**	**22,454**	**16,058**	**23,284**	**16,665**	**24,198**
UNIT CONTRIBUTION TO UNALLOCATED										
OVERHEAD/FIXED COSTS	**4,694**	**7,028**	**5,373**	**7,352**	**5,324**	**7,456**	**5,200**	**7,113**	**4,823**	**6,484**
ALLOCATION OF OVERHEAD EXPENSES										
HIRED LABOR	0	0	0	0	0	0	0	0	0	0
MANAGEMENT	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
OTHER FARM EXPENSES	39	61	39	62	39	63	40	64	41	65
CROP STORAGE COSTS	0	0	0	0	0	0	0	0	0	0
CONSERVATION & ENVIRONMENT	0	0	0	0	0	0	0	0	0	0
INTEREST COST LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST COST INTERMEDIATE	0	0	0	0	0	0	0	0	0	0
INTEREST COST OPERATING DEBT	0	4	1	0	0	0	0	0	0	0
INTEREST COST CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	0	0	0	0	0	0	0
TOTAL ALLOCATED EXPENSES	**39**	**65**	**40**	**62**	**39**	**63**	**40**	**64**	**41**	**65**
UNIT NET INCOME	**4,655**	**6,963**	**5,333**	**7,290**	**5,285**	**7,393**	**5,160**	**7,049**	**4,782**	**6,419**

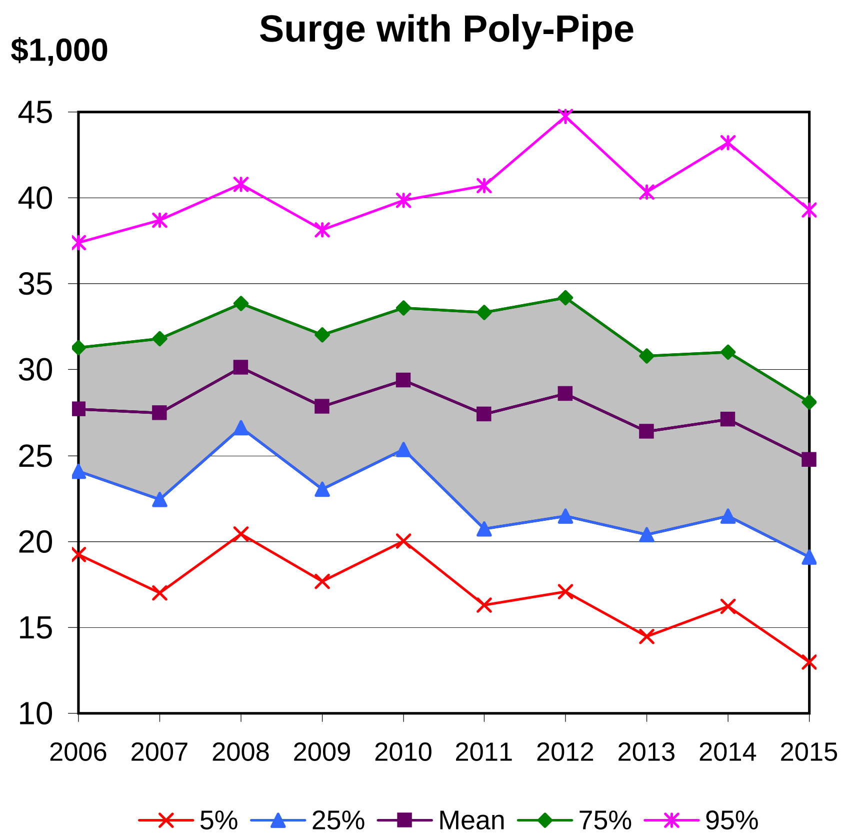
Table 42-5. Cotton & Grain Sorghum, Surge Irrigation Demonstration

	Surge
Total Crop Receipts ($1000)	
2006	92.96
2007	83.49
2008	93.12
2009	83.65
2010	94.16
2011	85.17
2012	95.79
2013	86.21
2014	96.73
2015	86.95
2006-2015 Average	**89.82**
Total Cash Costs ($1000)	
2006	65.27
2007	56.02
2008	62.98
2009	55.78
2010	64.76
2011	57.76
2012	67.20
2013	59.80
2014	69.62
2015	62.19
2006-2015 Average	**62.14**
Net Cash Farm Income ($1000)	
2006	27.69
2007	27.47
2008	30.14
2009	27.87
2010	29.39
2011	27.40
2012	28.59
2013	26.41
2014	27.11
2015	24.76
2006-2015 Average	**27.68**
Ending Cash Reserves ($1000)	
2006	27.69
2007	55.16
2008	85.32
2009	113.24
2010	142.74
2011	170.35
2012	199.24
2013	226.10
2014	253.84
2015	279.47
2006-2015 Average	**155.31**

Table 42-5. Cotton & Grain Sorghum, Surge Irrigation Demonstration

	Surge
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**
Average Annual Operating Expense/Receipts	
2006	0.70
2007	0.67
2008	0.68
2009	0.67
2010	0.69
2011	0.68
2012	0.71
2013	0.70
2014	0.73
2015	0.72
2006-2015 Average	**0.70**

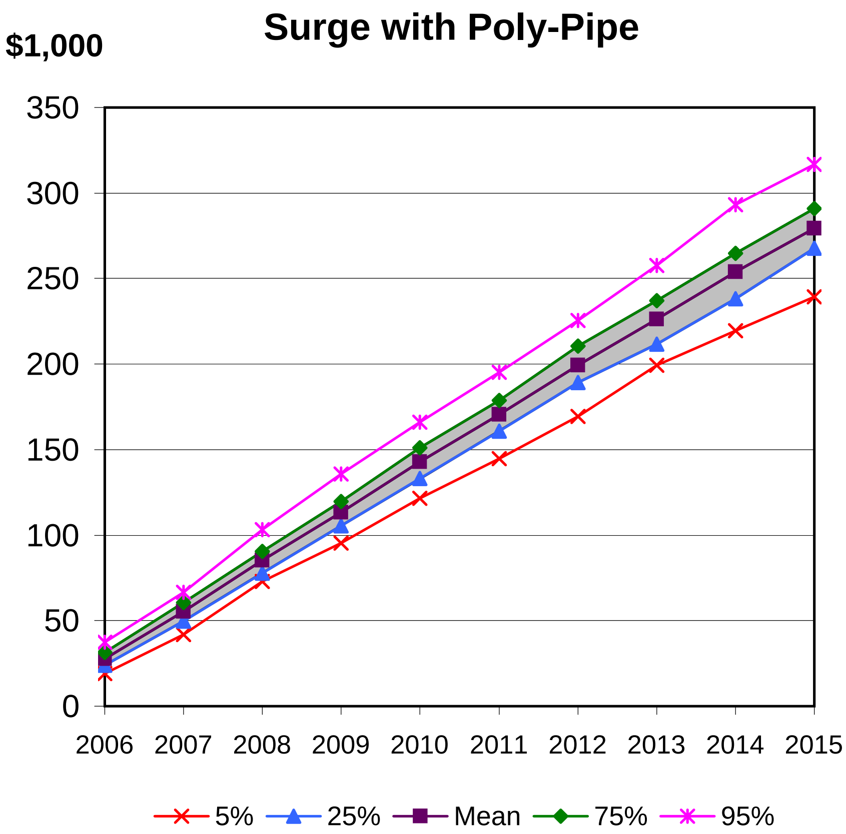
Figure 42-1. Projected Variability in Net Cash Farm Income for Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 42-2. Projected Variability in Ending Cash Reserves for Cotton & Grain Sorghum, Surge Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Sites 43A & 43B: Cotton, Furrow with Poly-Pipe vs. Drip Irrigation

The basic costs of production assumptions for the cotton furrow with poly-pipe vs. drip demonstration are given in Tables 43-1 and 43-2. For the purpose of presenting economic viability and outlook for the 38-acre furrow and 17-acre drip sites, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38 acres of furrow and 17 acres of drip cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.56/lb., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the furrow irrigation is provided in Table 43-3-A, followed by a cash flow summary (Table 43-3-B). Drip results are provided in Tables 43-4-A and 43-4-B. These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 43-5 and Figures 43-1. Table 43-5 presents the average outcomes for selected financial projections, while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Because the furrow and drip plots were not equal in acreages, a per-acre analysis reflects a more accurate comparison of key indicators. Total cash receipts average about $590 per acre for both irrigation methods. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Due primarily to the required replacement of drip tape every two years, cash costs average $530 per acre fro the drip compared to $400 per acre for the furrow irrigation. Peak cash cost years reflect those years where drip tape is replaced. NCFI on a per acre for the furrow plot averages $190 per acre, over three times higher than for the drip plot. The risk associated with prices and yields suggests that, in a normal production year, NCFI (Figure 43-1) could range as much as $5,000 ($132 per acre) plus or minus the average expected NCFI for the furrow site. However, for the drip site, NCFI is projected to be highly volatile with a higher probability of being negative. Cash reserves are expected to grow throughout the 10-year projection period for the furrow site (Table 43-5). Ending cash reserves for the furrow site are projected to reach $70,960, substantially higher than the $5,560 for the drip site. The average cash flow balances (Table 43-5) are intended to illustrate the cash requirements or flows generated by the two irrigation methods.

Table 43-1. Cotton, Furrow Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr
PLANTED ACRES	38	38
BASE ACRES	29.91	0
YIELD UNITS	lb	ton
BUDGETING YIELD	1000	0.75
FARM PROG YLD DIR	959	0
FARM PROG YLD CCP	959	0
PRICES/YIELD UNIT	0.44	99.07
VARIABLE PRODUCTION COSTS ($/ACRE)		
SEED	31.29	0
FERTILIZER	36.05	0
HERBICIDES	15	0
INSECTICIDES	40	0
FUNGICIDES	0	0
CUSTOM APPLICATION	30	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	51	0
TILLAGE/HARVST FUEL	17.77	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.15	0
HARVEST COST/ACRE	10	0
BOLL WEEVIL COST/ACRE	28	0
LABOR COST /ACRE	30	0
LANDLORDS SHARE FRACTIONS		
CROP PRODUCTION	0.25	0.25
SEED	0	0
FERTILIZER	0.25	0
HERBICIDES	0	0
INSECTICIDES	0.25	0
FUNGICIDES	0	0
CUSTOM APPLICATION	0	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	0	0
TILL/HARVEST FUEL	0	0
HARVEST, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.25	0
HARVEST COST/ACRE	0	0
BOLL WEEVIL COST/ACRE	0	0
LABOR COST /ACRE	0	0
CROP INSURANCE		
YIELD ELECTION (FRACTION)	0.65	0
YIELD COVERAGE GUARANTEE	505.57	0
PRICE ELECTION (FRACTION)	1	0
PRICE GUARANTEE	0.4788	0
PREMIUM RATE ($/ACRE)	11.1	0
PREMIUM COSTS	421.8	0

Table 43-2. Cotton, Drip Irrigation Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	Cotton Irr	Cotton SdIrr
PLANTED ACRES	17	17
BASE ACRES	13.44	0
YIELD UNITS	lb	ton
BUDGETING YIELD	1000	0.75
FARM PROG YLD DIR	959	0
FARM PROG YLD CCP	959	0
PRICES/YIELD UNIT	0.44	99.07
VARIABLE PRODUCTION COSTS ($/ACRE)		
SEED	31.29	0
FERTILIZER	36.05	0
HERBICIDES	15	0
INSECTICIDES	40	0
FUNGICIDES	0	0
CUSTOM APPLICATION	30	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	60	0
TILLAGE/HARVST FUEL	17.77	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.15	0
HARVEST COST/ACRE	10	0
BOLL WEEVIL COST/ACRE	28	0
LABOR COST /ACRE	30	0
LANDLORDS SHARE FRACTIONS		
CROP PRODUCTION	0.25	0.25
SEED	0	0
FERTILIZER	0.25	0
HERBICIDES	0	0
INSECTICIDES	0.25	0
FUNGICIDES	0	0
CUSTOM APPLICATION	0	0
SCOUTING / OTHER	0	0
IRRIGATION FUEL	0	0
TILL/HARVEST FUEL	0	0
HARVEST, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.25	0
HARVEST COST/ACRE	0	0
BOLL WEEVIL COST/ACRE	0	0
LABOR COST /ACRE	0	0
CROP INSURANCE		
YIELD ELECTION (FRACTION)	0.65	0
YIELD COVERAGE GUARANTEE	505.57	0
PRICE ELECTION (FRACTION)	1	0
PRICE GUARANTEE	0.4788	0
PREMIUM RATE ($/ACRE)	11.1	0
PREMIUM COSTS	188.7	0

Table 43 - 3 - A. Cotton, Furrow Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	14,658	15,502	15,851	15,933	16,304	16,684	17,070	17,418	17,472	17,530
DECOUPLED DIRECT PAYMENTS	1,401	1,401	1,401	1,401	1,401	1,401	1,401	1,401	1,401	1,401
DECOUPLED CCPs	2,685	2,649	2,616	2,563	2,441	2,243	2,054	1,878	1,774	1,753
MARKETING LOAN PAYMENTS	3,494	2,912	2,665	2,488	2,266	2,038	1,801	1,613	1,592	1,568
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**22,237**	**22,465**	**22,533**	**22,385**	**22,412**	**22,366**	**22,326**	**22,311**	**22,239**	**22,253**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	1,189	1,206	1,220	1,240	1,260	1,282	1,302	1,320	1,339	1,358
FERTILIZER COSTS	1,027	994	967	978	997	1,021	1,041	1,061	1,079	1,098
HERBICIDE COSTS	570	564	561	565	571	580	589	597	605	614
INSECTICIDE COSTS	1,140	1,135	1,137	1,153	1,172	1,194	1,218	1,240	1,262	1,284
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	1,140	1,107	1,078	1,088	1,103	1,121	1,139	1,157	1,178	1,199
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,938	1,881	1,833	1,850	1,874	1,906	1,936	1,966	2,002	2,039
FUEL & LUBE COSTS	675	655	639	645	653	664	675	685	698	711
HARVESTING COSTS	4,655	4,533	4,430	4,485	4,559	4,650	4,738	4,827	4,931	5,037
CROP INSURANCE PREMIUMS	422	422	422	422	422	422	422	422	422	422
BOLL WEEVIL COSTS	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064
HIRED LABOR COSTS	1,140	1,170	1,202	1,231	1,263	1,297	1,333	1,369	1,408	1,448
SUB-TOTAL OF PROD COSTS	14,961	14,730	14,551	14,720	14,938	15,201	15,457	15,708	15,988	16,274
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	14,961	14,730	14,551	14,720	14,938	15,201	15,457	15,708	15,988	16,274
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	3	0	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**14,961**	**14,733**	**14,551**	**14,720**	**14,938**	**15,201**	**15,457**	**15,708**	**15,988**	**16,274**
NET CASH FARM INCOME	**7,277**	**7,732**	**7,982**	**7,665**	**7,474**	**7,165**	**6,869**	**6,603**	**6,251**	**5,979**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	-1
NET FARM INCOME	**7,277**	**7,732**	**7,982**	**7,665**	**7,474**	**7,165**	**6,869**	**6,603**	**6,251**	**5,978**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	585	591	593	589	590	589	588	587	585	586
CASH EXPENSES ($/ACRE)	394	388	383	387	393	400	407	413	421	428
NET CASH INCOME ($/ACRE)	191	203	210	202	197	189	181	174	165	157

Table 43 - 3 - B. Cotton, Furrow Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**7,277**	**15,010**	**22,997**	**30,675**	**38,179**	**45,399**	**52,351**	**59,074**	**65,493**
PLUS:										
NET CASH FARM INCOME	7,277	7,732	7,982	7,665	7,474	7,165	6,869	6,603	6,251	5,979
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	1	5	13	30	55	83	120	169	224
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**7,277**	**15,010**	**22,997**	**30,675**	**38,179**	**45,399**	**52,351**	**59,074**	**65,493**	**71,696**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	7,277	15,010	22,997	30,675	38,179	45,399	52,351	59,074	65,493	71,696
ENDING YEAR CASH RESERVE	**7,277**	**15,010**	**22,997**	**30,675**	**38,179**	**45,399**	**52,351**	**59,074**	**65,493**	**71,696**

Table 43 - 4 - A. Cotton, Drip Irrigation Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	6,557	6,935	7,091	7,128	7,294	7,464	7,636	7,792	7,816	7,843
DECOUPLED DIRECT PAYMENTS	630	630	630	630	630	630	630	630	630	630
DECOUPLED CCPs	1,206	1,190	1,175	1,152	1,097	1,008	923	844	797	788
MARKETING LOAN PAYMENTS	1,563	1,303	1,192	1,113	1,014	912	806	722	712	702
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**9,956**	**10,058**	**10,088**	**10,022**	**10,034**	**10,013**	**9,995**	**9,988**	**9,955**	**9,962**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	532	539	546	555	564	573	583	590	599	607
FERTILIZER COSTS	460	445	433	437	446	457	466	475	483	491
HERBICIDE COSTS	255	252	251	253	256	259	264	267	271	275
INSECTICIDE COSTS	510	508	509	516	524	534	545	555	565	574
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	510	495	482	487	493	502	509	517	527	537
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,020	990	965	974	986	1,003	1,019	1,035	1,054	1,073
FUEL & LUBE COSTS	302	293	286	288	292	297	302	307	312	318
HARVESTING COSTS	2,082	2,028	1,982	2,006	2,039	2,080	2,120	2,160	2,206	2,254
CROP INSURANCE PREMIUMS	189	189	189	189	189	189	189	189	189	189
BOLL WEEVIL COSTS	476	476	476	476	476	476	476	476	476	476
HIRED LABOR COSTS	510	523	538	551	565	580	596	612	630	648
SUB-TOTAL OF PROD COSTS	6,846	6,738	6,654	6,731	6,831	6,951	7,068	7,183	7,311	7,442
CASH RENT FOR CROPLAND	0	0	0	0	0	0	0	0	0	0
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Drip Tape	4,080	0	4,080	0	4,080	0	4,080	0	4,080	0
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	10,926	6,738	10,734	6,731	10,911	6,951	11,148	7,183	11,391	7,442
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	3	10	8	19	17	26	21	32	23
INTEREST ON CARRYOVER DEBT	0	4	3	5	0	0	0	0	0	0
TOTAL CASH EXPENSES	**10,926**	**6,745**	**10,747**	**6,745**	**10,930**	**6,968**	**11,174**	**7,203**	**11,422**	**7,464**
NET CASH FARM INCOME	**-969**	**3,314**	**-658**	**3,277**	**-896**	**3,045**	**-1,179**	**2,784**	**-1,467**	**2,497**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	-288	-533	-453	-385	-336	-336	-336	-336	-336	-336
NET FARM INCOME	**-1,257**	**2,781**	**-1,111**	**2,892**	**-1,231**	**2,709**	**-1,515**	**2,449**	**-1,802**	**2,161**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	586	592	593	590	590	589	588	588	586	586
CASH EXPENSES ($/ACRE)	643	397	632	397	643	410	657	424	672	439
NET CASH INCOME ($/ACRE)	-57	195	-39	193	-53	179	-69	164	-86	147

Table 43 - 4 - B. Cotton, Drip Irrigation Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**0**	**0**	**0**	**1,123**	**228**	**3,273**	**2,098**	**4,885**	**3,426**
PLUS:										
NET CASH FARM INCOME	-969	3,314	-658	3,277	-896	3,045	-1,179	2,784	-1,467	2,497
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	0	0	0	1	0	4	3	8	7
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**-969**	**3,314**	**-658**	**3,277**	**228**	**3,273**	**2,098**	**4,885**	**3,426**	**5,930**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	3,840	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	4,809	1,496	2,154	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**3,840**	**4,809**	**1,496**	**2,154**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	-4,809	-1,496	-2,154	1,123	228	3,273	2,098	4,885	3,426	5,930
ENDING YEAR CASH RESERVE	**0**	**0**	**0**	**1,123**	**228**	**3,273**	**2,098**	**4,885**	**3,426**	**5,930**

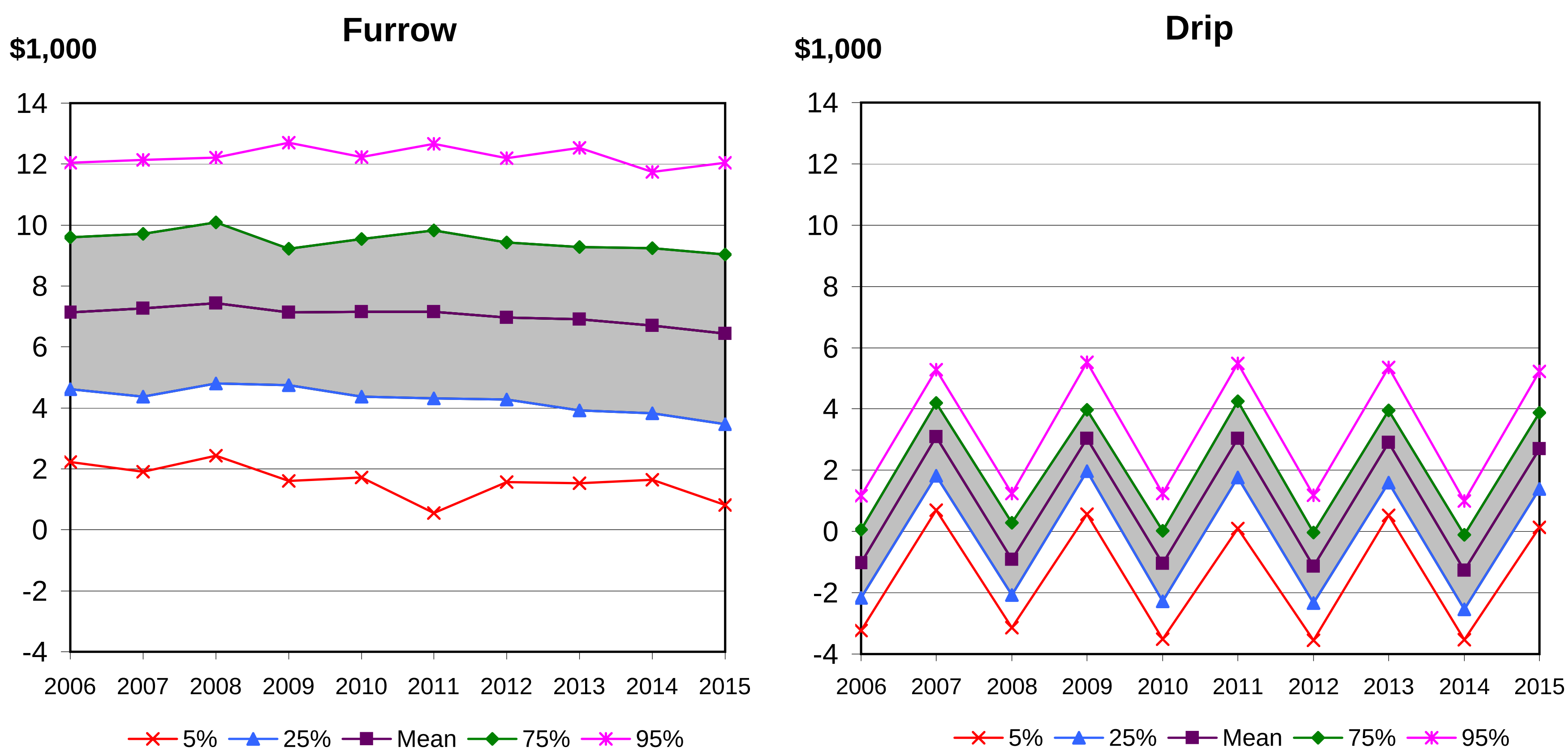
Table 43-5. Cotton, Furrow & Drip Irrigation Demonstration

	Furrow		Drip	
	Total (38 acres)	**Per Acre**	**Total (17 acres)**	**Per Acre**
Total Cash Receipts ($1000)				
2006	22.11	0.58	9.90	0.58
2007	22.00	0.58	9.85	0.58
2008	21.98	0.58	9.84	0.58
2009	21.86	0.58	9.79	0.58
2010	22.10	0.58	9.89	0.58
2011	22.37	0.59	10.01	0.59
2012	22.42	0.59	10.04	0.59
2013	22.61	0.60	10.12	0.60
2014	22.69	0.60	10.16	0.60
2015	22.70	0.60	10.16	0.60
2006-2015 Average	**22.28**	0.59	**9.98**	0.59
Total Cash Costs ($1000)				
2006	14.96	0.39	10.93	0.64
2007	14.74	0.39	6.75	0.40
2008	14.55	0.38	10.75	0.63
2009	14.72	0.39	6.75	0.40
2010	14.94	0.39	10.93	0.64
2011	15.21	0.40	6.98	0.41
2012	15.45	0.41	11.18	0.66
2013	15.71	0.41	7.21	0.42
2014	16.00	0.42	11.43	0.67
2015	16.27	0.43	7.47	0.44
2006-2015 Average	**15.25**	0.40	**9.04**	0.53
Net Cash Farm Income ($1000)				
2006	7.14	0.19	-1.03	-0.06
2007	7.26	0.19	3.10	0.18
2008	7.43	0.20	-0.91	-0.05
2009	7.14	0.19	3.04	0.18
2010	7.16	0.19	-1.04	-0.06
2011	7.16	0.19	3.03	0.18
2012	6.97	0.18	-1.14	-0.07
2013	6.91	0.18	2.91	0.17
2014	6.70	0.18	-1.27	-0.07
2015	6.43	0.17	2.69	0.16
2006-2015 Average	**7.03**	0.19	**0.94**	0.06
Ending Cash Reserves ($1000)				
2006	7.14	0.19	-4.87	-0.29
2007	14.40	0.38	-1.77	-0.10
2008	21.83	0.57	-2.68	-0.16
2009	28.99	0.76	0.36	0.02
2010	36.18	0.95	-0.68	-0.04
2011	43.39	1.14	2.36	0.14
2012	50.43	1.33	1.22	0.07
2013	57.46	1.51	4.14	0.24
2014	64.31	1.69	2.87	0.17
2015	70.96	1.87	5.56	0.33
2006-2015 Average	**39.51**	1.04	**0.65**	0.04

Table 5. Cotton, Furrow & Drip Irrigation Demonstration

	Furrow (38 acres)	Drip (17 acres)
Prob. Net Cash Income < Zero (%)		
2006	1.00	70.00
2007	1.00	1.00
2008	1.00	70.00
2009	1.00	1.00
2010	1.00	73.00
2011	1.00	2.00
2012	1.00	76.00
2013	1.00	1.00
2014	1.00	78.00
2015	2.00	3.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**1.00**	**37.40**
Average Annual Operating Expense/Receipts		
2006	0.69	1.13
2007	0.69	0.70
2008	0.68	1.12
2009	0.69	0.71
2010	0.69	1.14
2011	0.70	0.72
2012	0.71	1.15
2013	0.71	0.73
2014	0.72	1.16
2015	0.74	0.75
2006-2015 Average	**0.70**	**0.93**

Figure 43-1. Projected Variability in Net Cash Farm Income for Furrow vs. Drip Irrrigated Cotton.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Demonstration Site 44A: Cotton, Surge Irrigation with Poly-Pipe

The basic costs of production assumptions for the cotton surge with poly-pipe demonstration are given in Table 44A-1. For the purpose of presenting economic viability and outlook for the 38-acre site, production costs and overhead charges are producer estimated rates and may not reflect all producers but should be reasonable for the region. The first year of the financial projection is 2006. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38 acres of surge irrigation with poly-pipe cotton production. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.529/lb., including marketing loan deficiency payments. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

The analysis also includes the purchase and use of a surge valve at a cost of $2,200. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

A detail of the income and expense projection for the surge irrigation with poly-pipe is provided in Table 44A-2-A, followed by a cash flow summary (Table 44A-2-B). These income and cash flow statements result from the simplistic (no risk) forecast assuming average prices and yields. A more comprehensive projection, including price and yield risk, is illustrated in Table 44A-3 and Figures 44A-1 and 44A-2. Table 44A-3 presents the average outcomes for selected financial projections,

while the graphical presentation illustrates the full range of possibilities for Net Cash Farm Income (NCFI).

Total cash receipts average $22,490 over the 10-year period and cash costs average just under $17,370. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. NCFI increases throughout the 10-year period from $2,870 in 2006 to $6,440 in 2015 (Table 44A-3). The risk associated with prices and yields suggests some chances of negative NCFI. In a normal production year, NCFI (Figure 44A-1) could range as much as $6,000 plus or minus the average expected NCFI for the site. Cash reserves are expected to grow throughout the 10-year projection period and reach $51,680 by 2015 (Table 44A-3). The average cash flow balances (Table 44A-3) are intended to illustrate the cash requirements or flows generated using the surge irrigation method. Figure 44A-2 depicts the growth in cash reserves, and the risk associated with the ending cash balance by reflecting the probability of carryover debt in the early years of the projection. The probability of carryover debt is 18% or greater in 2006 and then declines to 1% of less by 2011.

Table 44A-1. Cotton, Surge Irrigation with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS IN 2006.

	SprCorn	Sorghm Irr	Cotton Irr	Cotton SdIrr
PLANTED ACRES	0	0	38	38
BASE ACRES	6.27	4.89	22.42	0
YIELD UNITS	bu	cwt	lb	ton
BUDGETING YIELD	83	45	750	0.63
FARM PROG YLD DIR	79	35.28	550	0
FARM PROG YLD CCP	79	35.28	550	0
PRICES/YIELD UNIT	2.46	3.62	0.45	106.62
VARIABLE PRODUCTION COSTS ($/ACRE)				
SEED	45	16	45	0
FERTILIZER	30	24	31	0
HERBICIDES	15	5	20	0
INSECTICIDES	0	0	0	0
FUNGICIDES	0	0	0	0
CUSTOM APPLICATION	0	0	30	0
SCOUTING / OTHER	0	0	0	0
IRRIGATION FUEL	42	18	40	0
TILLAGE/HARVST FUEL	0	0	21	0
HARVESTING, HAULING, DRYING & CHECKOFF: $/YIELD UNIT	0.152	0.27	0.12	0
HARVEST COST/ACRE	0	0	0	0
BOLL WEEVIL COST/ACRE	0	0	28	0
LABOR COST /ACRE	0	0	57	0
CROP INSURANCE				
YIELD ELECTION (FRACTION)	0.65	0.5	0.65	0
YIELD COVERAGE GUARANTEE	0	0	383.305	0
PRICE ELECTION (FRACTION)	1	1	1	0
PRICE GUARANTEE	0	0	0.5115	0
PREMIUM RATE ($/ACRE)	9.16	5.38	10.1	0
PREMIUM COSTS	0	0	383.8	0

Table 44A - 2 - A. Cotton, Surge with Poly-Pipe Demonstratior

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	15,377	16,401	17,349	17,683	17,991	18,618	18,937	19,291	19,621	19,973
DECOUPLED DIRECT PAYMENTS	909	909	909	909	909	909	909	909	909	909
DECOUPLED CCPs	1,581	1,409	1,245	1,123	1,071	1,068	1,031	988	982	978
MARKETING LOAN PAYMENTS	2,720	2,229	1,933	1,766	1,818	1,783	1,667	1,660	1,706	1,673
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**20,588**	**20,948**	**21,435**	**21,480**	**21,789**	**22,379**	**22,543**	**22,847**	**23,217**	**23,534**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	1,710	1,735	1,712	1,729	1,754	1,783	1,799	1,820	1,838	1,853
FERTILIZER COSTS	1,178	1,185	1,172	1,158	1,174	1,184	1,192	1,212	1,230	1,243
HERBICIDE COSTS	760	758	749	755	763	770	778	788	796	802
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
MAINTENANCE & EQUIPMENT	1,140	1,124	1,059	1,025	997	975	965	976	992	1,007
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION FUEL COSTS	1,520	1,520	1,520	1,534	1,555	1,581	1,606	1,631	1,661	1,691
FUEL & LUBE COSTS	798	787	741	717	698	683	675	683	694	705
HARVESTING COSTS	3,420	3,428	3,283	3,228	3,191	3,174	3,191	3,282	3,389	3,496
CROP INSURANCE PREMIUMS	384	384	384	384	384	384	384	384	384	384
BOLL WEEVIL COSTS	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064	1,064
HIRED LABOR COSTS	2,166	2,232	2,304	2,368	2,426	2,489	2,553	2,613	2,675	2,737
SUB-TOTAL OF PROD COSTS	14,140	14,217	13,989	13,963	14,004	14,087	14,206	14,453	14,723	14,982
CASH RENT FOR CROPLAND	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660	2,660
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
Surge Valve	220	220	220	220	220	220	220	220	220	220
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	17,020	17,097	16,869	16,843	16,884	16,967	17,086	17,333	17,603	17,862
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	638	538	397	244	78	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	0	0	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**17,658**	**17,635**	**17,266**	**17,086**	**16,962**	**16,967**	**17,086**	**17,333**	**17,603**	**17,862**
NET CASH FARM INCOME	**2,930**	**3,312**	**4,170**	**4,394**	**4,827**	**5,411**	**5,457**	**5,514**	**5,613**	**5,672**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**2,930**	**3,312**	**4,170**	**4,394**	**4,827**	**5,411**	**5,457**	**5,514**	**5,613**	**5,672**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	542	551	564	565	573	589	593	601	611	619
CASH EXPENSES ($/ACRE)	465	464	454	450	446	447	450	456	463	470
NET CASH INCOME ($/ACRE)	77	87	110	116	127	142	144	145	148	149

Table 44A - 2 - B. Cotton, Surge Irrigation with Poly-Pipe Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**2,930**	**6,246**	**10,423**	**14,831**	**19,680**	**25,124**	**30,636**	**36,231**	**41,957**
PLUS:										
NET CASH FARM INCOME	2,930	3,312	4,170	4,394	4,827	5,411	5,457	5,514	5,613	5,672
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	4	7	15	21	34	55	81	112	149
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**2,930**	**6,246**	**10,423**	**14,831**	**19,680**	**25,124**	**30,636**	**36,231**	**41,957**	**47,778**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	0	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	0	0	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	2,930	6,246	10,423	14,831	19,680	25,124	30,636	36,231	41,957	47,778
ENDING YEAR CASH RESERVE	**2,930**	**6,246**	**10,423**	**14,831**	**19,680**	**25,124**	**30,636**	**36,231**	**41,957**	**47,778**

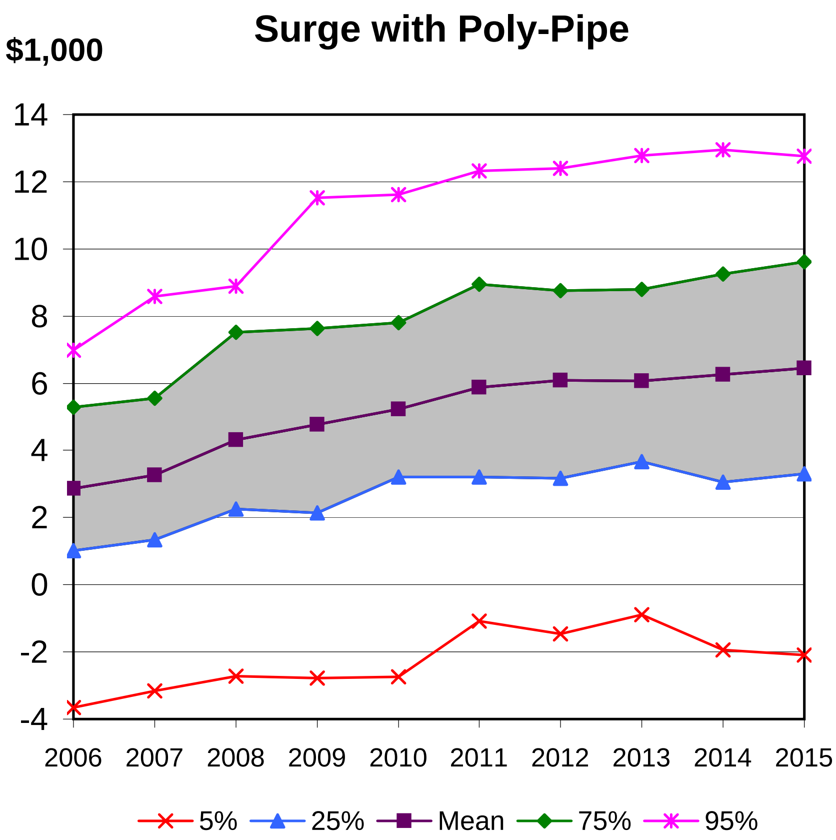
Table 44A-3. Cotton, Surge Irrigation with Poly-Pipe Demonstration

	Surge with Poly-Pipe
Total Cash Receipts ($1000)	
2006	20.51
2007	20.90
2008	21.57
2009	21.90
2010	22.25
2011	22.93
2012	23.23
2013	23.41
2014	23.86
2015	24.31
2006-2015 Average	**22.49**
Total Cash Costs ($1000)	
2006	17.64
2007	17.64
2008	17.27
2009	17.12
2010	17.04
2011	17.05
2012	17.15
2013	17.35
2014	17.61
2015	17.87
2006-2015 Average	**17.37**
Net Cash Farm Income ($1000)	
2006	2.87
2007	3.26
2008	4.31
2009	4.78
2010	5.22
2011	5.88
2012	6.08
2013	6.06
2014	6.26
2015	6.44
2006-2015 Average	**5.12**
Prob. Net Cash Income < Zero (%)	
2006	18.00
2007	18.00
2008	14.00
2009	11.00
2010	10.00
2011	9.00
2012	8.00
2013	8.00
2014	13.00
2015	10.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**11.90**

Table 44A-3. Cotton, Surge Irrigation with Poly-Pipe Demonstration

	Surge with poly-Pipe
Ending Cash Reserves ($1000)	
2006	2.87
2007	6.14
2008	10.45
2009	15.25
2010	20.49
2011	26.41
2012	32.55
2013	38.70
2014	45.08
2015	51.68
2006-2015 Average	**24.96**
Prob. of Ending Cash Reserves < Zero (%)	
2006	18.00
2007	10.00
2008	7.00
2009	4.00
2010	2.00
2011	1.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Ending Cash Reserves < Zero 2006-2015 (%)	**4.30**
Average Annual Operating Expense/Receipts	
2006	0.86
2007	0.85
2008	0.81
2009	0.80
2010	0.79
2011	0.77
2012	0.76
2013	0.77
2014	0.77
2015	0.77
2006-2015 Average	**0.79**

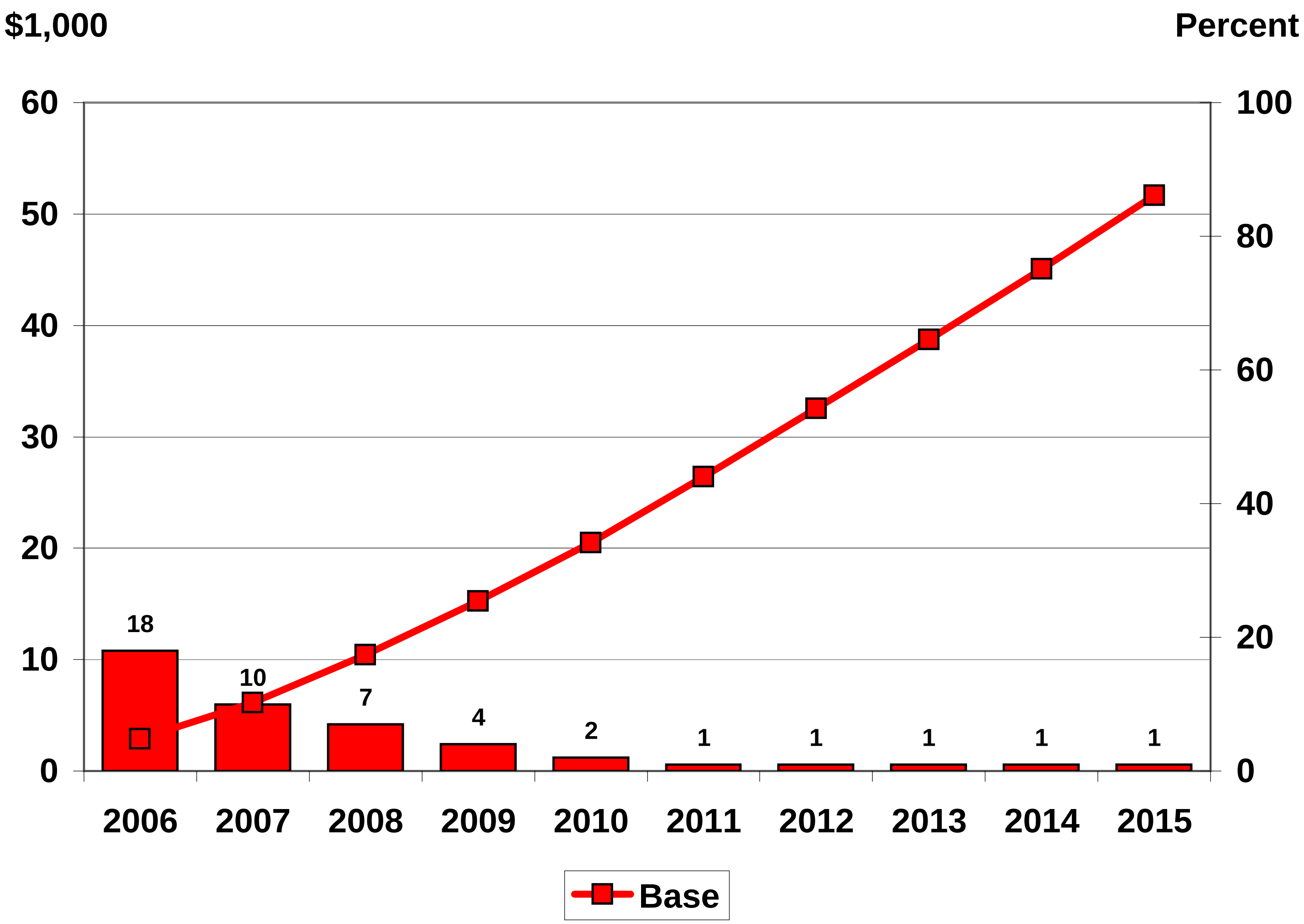
Figure 44A-1. Projected Variability in Net Cash Farm Income for Irrigated Cotton, Surge Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 44A-2. Ending Cash Reserves and Prob. of Having to Refinance Operating Note for Irrigated Cotton, Surge Irrigation with Poly-Pipe Demonstration.



FARM Assistance

Helping Agriculture Make Informed Decisions

Demonstration Site 45: Sugarcane, Furrow Irrigation with Poly-Pipe

Table 45-1 provides the basic cost of production assumptions for the sugarcane furrow irrigation with poly-pipe demonstration. For the purpose of presenting economic viability and outlook for the 38-acre site, production costs and overhead charges are producer estimated rates and may not be typical for the region. The actual demonstration was conducted on a new field of sugarcane, where 2006 is the establishment year of the crop and the first year of the financial projection. The assumptions and projections are intended to make the illustration relevant to a wide range of producers in the Lower Rio Grande Valley area.

The analysis consists of a 10-year financial outlook for the 38 acres of sugarcane production including the initial outright purchase of sugarcane grinding rights ($800/acre) with no financing. While the baseline scenario produces a negative cash position and subsequent negative carryover cash balances, no interest was charged on carryover balances. The purpose is to illustrate the amount of cash flow a producer would have to support. Some may support that cash flow with extended term debt, and others may be able to self finance the purchase with no direct interest cost. For the 10-year outlook projection, the sugarcane price is based on the producer’s estimate of future prices and is held at an average of $17 per ton throughout the analysis period. Other commodity price trends and cost inflation estimates are provided by the Food and Agricultural Policy Research Institute (FAPRI, at the University of Missouri).

A detail of the income and expense projection for the baseline is provided in Table 45-2-A, followed by a cash flow summary (Table 45-2-B). The income and cash flow statement results from the simplistic (no risk) forecast assuming average prices and yields. The more comprehensive projection including price and yield risk is illustrated in Table 45-3 and Figures 45-1, 45-2 & 45-3. Table 45-3 presents the average outcomes for selected financial projections, while the graphical presentations illustrate the full range of possibilities for Net Cash Farm Income (NCFI) and cash flow requirements. Total cash receipts average just over $32,000 initially and decline as the productive capacity of the sugarcane diminishes until the sixth year when the land is idle. Cash costs also reflect the sugarcane production cycle, requiring roughly $21,080 in the initial year, about one-half that amount in subsequent years and approximately $4,930 in the idle year. Average NCFI generally follows the sugarcane production cycle producing $11,180 profit in the initial year and peaking at $17,310 the second year. It averages approximately $9,680 per year for the assumed 6-year sugarcane cycle. The risk associated with prices and yields suggests that, in a normal production year, NCFI (Figure 45-1) could range as much as $7,000 to $8,000 plus or minus the average expected NCFI. Except for the 2011 idle year, cash reserves are expected to grow throughout the 10-year projection period Figure 45-2. The average cash flow balances (line in Figures 45-2 and 45-3) are intended to illustrate the cash requirements or positive flows generated by the enterprise. The bars in Figure 45-3 indicate the probability of the net cash impact being negative in a specific year. It is important to note here that, although not included, the base could also create definitive interest charges depending on the whole farm's ability to support the cash requirements of the enterprise.

Table 45-1. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration

SUMMARY OF CROP ACREAGE, YIELD, AND VARIABLE COSTS.

	Sugar Cane
PLANTED ACRES	38
BASE ACRES	0
YIELD UNITS	ton
BUDGETING YIELD	50
FARM PROG YLD DIR	0
FARM PROG YLD CCP	0
PRICES/YIELD UNIT	17
VARIABLE PRODUCTION COSTS ($/ACRE)	
SEED	0
FERTILIZER	48
HERBICIDES	18
INSECTICIDES	0
FUNGICIDES	0
CUSTOM APPLICATION	0
SCOUTING / OTHER	0
IRRIGATION FUEL	56
TILLAGE/HARVST FUEL	16
HARVESTING, HAULING, DRYING & CHECKOFF:	
$/YIELD UNIT	0
HARVEST COST/ACRE	0
BOLL WEEVIL COST/ACRE	0
LABOR COST /ACRE	33
CROP INSURANCE	
YIELD ELECTION (FRACTION)	0.65
YIELD COVERAGE GUARANTEE	0
PRICE ELECTION (FRACTION)	1
PRICE GUARANTEE	16
PREMIUM RATE ($/ACRE)	13
PREMIUM COSTS	494

Table 45 - 2 - A. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstratio

INCOME STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
CASH INCOME (NET OF SHARE LEASE)										
CASH RECEIPTS FOR CROPS	32,300	29,070	25,840	24,548	19,380	0	32,300	29,070	25,840	24,548
DECOUPLED DIRECT PAYMENTS	0	0	0	0	0	0	0	0	0	0
DECOUPLED CCPs	0	0	0	0	0	0	0	0	0	0
MARKETING LOAN PAYMENTS	0	0	0	0	0	0	0	0	0	0
MPCI CROP INSURANCE INDEMNITY	0	0	0	0	0	0	0	0	0	0
TOTAL CASH RECEIPTS	**32,300**	**29,070**	**25,840**	**24,548**	**19,380**	**0**	**32,300**	**29,070**	**25,840**	**24,548**
CASH FARM EXPENSE (NET OF SHARE LEASE)										
CROP PROD & HARVEST COSTS										
SEED COSTS	0	0	0	0	0	0	0	0	0	0
FERTILIZER COSTS	1,824	1,764	1,717	1,736	1,771	0	1,849	1,884	1,916	1,950
HERBICIDE COSTS	684	677	673	678	686	0	707	716	727	737
INSECTICIDE COSTS	0	0	0	0	0	0	0	0	0	0
FUNGICIDE COSTS	0	0	0	0	0	0	0	0	0	0
CUSTOM APPLICATION	0	0	0	0	0	0	0	0	0	0
SCOUTING & OTHER	0	0	0	0	0	0	0	0	0	0
IRRIGATION COSTS	2,128	2,066	2,012	2,031	2,058	0	2,126	2,159	2,199	2,239
FUEL & LUBE COSTS	608	590	575	580	588	0	607	617	628	640
HARVESTING COSTS	0	0	0	0	0	0	0	0	0	0
CROP INSURANCE PREMIUMS	494	494	494	494	494	0	494	494	494	494
BOLL WEEVIL COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	1,254	1,287	1,322	1,355	1,390	0	1,466	1,506	1,548	1,593
SUB-TOTAL OF PROD COSTS	6,992	6,878	6,793	6,874	6,986	0	7,249	7,376	7,512	7,652
CASH RENT FOR CROPLAND	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800	3,800
RENT PASTURE	0	0	0	0	0	0	0	0	0	0
MANAGEMENT COSTS	0	0	0	0	0	0	0	0	0	0
MANAGEMENT BONUS	0	0	0	0	0	0	0	0	0	0
ADDITIONAL MGMT. COSTS	0	0	0	0	0	0	0	0	0	0
HIRED LABOR COSTS	0	0	0	0	0	0	0	0	0	0
PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
PERSONAL PROPERTY TAXES	0	0	0	0	0	0	0	0	0	0
SALES TAXES FOR INPUTS	0	0	0	0	0	0	0	0	0	0
OTHER TAXES	0	0	0	0	0	0	0	0	0	0
ACCOUNTANT & LEGAL FEES	0	0	0	0	0	0	0	0	0	0
UNALLOCATED MAINTENANCE	0	0	0	0	0	0	0	0	0	0
UTILITIES	0	0	0	0	0	0	0	0	0	0
OTHER FUEL & LUBE	0	0	0	0	0	0	0	0	0	0
LIABILITY INSURANCE	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS COSTS	0	0	0	0	0	0	0	0	0	0
LandPrep	1,520	0	0	0	0	0	1,748	0	0	0
Seed	3,002	0	0	0	0	0	3,452	0	0	0
Planting	4,750	0	0	0	0	0	5,463	0	0	0
Irr&Prop Tax	1,013	1,032	1,052	1,076	1,102	1,131	1,162	1,193	1,225	1,258
LESS EXPENSES PREVIOUSLY PAID	0	0	0	0	0	0	0	0	0	0
PLUS PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL OF CASH COSTS	21,077	11,710	11,645	11,750	11,888	4,931	22,874	12,369	12,537	12,710
INTEREST ON LONG-TERM DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON INTERMED. DEBT	0	0	0	0	0	0	0	0	0	0
INTEREST ON OPERATING DEBT	0	5	10	0	0	0	0	0	0	0
INTEREST ON CARRYOVER DEBT	0	15	3	0	0	0	0	0	0	0
TOTAL CASH EXPENSES	**21,077**	**11,730**	**11,659**	**11,750**	**11,888**	**4,931**	**22,874**	**12,369**	**12,537**	**12,710**
NET CASH FARM INCOME	**11,223**	**17,340**	**14,181**	**12,798**	**7,492**	**-4,931**	**9,426**	**16,701**	**13,303**	**11,838**
ACCRUAL ADJUSTMENTS AND DEPRECIATION										
+/- CHANGE IN CROP INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN DEFERRED RECVBLS	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN LVSTK INVENTORY	0	0	0	0	0	0	0	0	0	0
+/- CHANGE IN PREPAID EXPENSES	0	0	0	0	0	0	0	0	0	0
+/- CHNG BASE VALU RAISED LVST	0	0	0	0	0	0	0	0	0	0
- BASIS BREEDING LVSTK SOLD	0	0	0	0	0	0	0	0	0	0
+ PURCHASED BREEDING LVSTK	0	0	0	0	0	0	0	0	0	0
- DEPRECIATION	0	0	0	0	0	0	0	0	0	0
NET FARM INCOME	**11,223**	**17,340**	**14,181**	**12,798**	**7,492**	**-4,931**	**9,426**	**16,701**	**13,303**	**11,838**
SUMMARY OF RECEIPTS & COSTS PER CROP ACRE										
CASH RECEIPTS ($/ACRE)	850	765	680	646	510	0	850	765	680	646
CASH EXPENSES ($/ACRE)	555	309	307	309	313	130	602	326	330	334
NET CASH INCOME ($/ACRE)	295	456	373	337	197	-130	248	439	350	312

Table 45 - 2 - B. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration

CASHFLOW STATEMENT FOR YEARS 2006 - 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
BEGINNING CASH	**0**	**0**	**0**	**12,344**	**25,148**	**32,664**	**27,788**	**37,250**	**54,034**	**67,495**
PLUS:										
NET CASH FARM INCOME	11,223	17,340	14,181	12,798	7,492	-4,931	9,426	16,701	13,303	11,838
OFF-FARM SALARY FARMER	0	0	0	0	0	0	0	0	0	0
OFF-FARM SALARY SPOUSE	0	0	0	0	0	0	0	0	0	0
NON-TAXABLE INCOME	0	0	0	0	0	0	0	0	0	0
INTEREST ON CASH RESERVES	0	0	0	5	25	54	36	84	158	238
INVESTMENT EARNINGS/DIVIDENDS	0	0	0	0	0	0	0	0	0	0
NEW CAPITAL INVESTED IN FARM	0	0	0	0	0	0	0	0	0	0
CORPORATE DIVIDENDS EARNED	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH DRAWS	0	0	0	0	0	0	0	0	0	0
CASH INVESTED FROM OWNERS	0	0	0	0	0	0	0	0	0	0
SELL MACH./LIVESTOCK/CROPS	0	0	0	0	0	0	0	0	0	0
PROCEEDS FROM ASSETS SOLD	0	0	0	0	0	0	0	0	0	0
TOTAL CASH AVAILABLE	**11,223**	**17,340**	**14,181**	**25,148**	**32,664**	**27,788**	**37,250**	**54,034**	**67,495**	**79,571**
MINUS:										
DOWN PYMT NON-MACH PURCHASE	30,400	0	0	0	0	0	0	0	0	0
CASH DIFFERENCE MACH REPLACED	0	0	0	0	0	0	0	0	0	0
PAYOFF MACHINERY BOUGHT										
REG. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. LONG-TERM	0	0	0	0	0	0	0	0	0	0
REG. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
ACC. PRINCIPAL PAY. INTR-TERM	0	0	0	0	0	0	0	0	0	0
PAY OPERATING LOAN CARRYOVER	0	19,177	1,837	0	0	0	0	0	0	0
FIXED INVESTMENT CONTRIBUTION	0	0	0	0	0	0	0	0	0	0
ADDITIONAL INVESTMENTS	0	0	0	0	0	0	0	0	0	0
CASH PAID TO PRTNSHIP/CORPS	0	0	0	0	0	0	0	0	0	0
PARTNERSHIP CASH WITHDRAWAL	0	0	0	0	0	0	0	0	0	0
FEDERAL INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
STATE INCOME TAX PAYMENTS	0	0	0	0	0	0	0	0	0	0
SELF-EMPLOYMENT+SOC SEC TAXES	0	0	0	0	0	0	0	0	0	0
TOTAL CASH OUTFLOWS	**30,400**	**19,177**	**1,837**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SURPLUS OR DEFICIT CASH	-19,177	-1,837	12,344	25,148	32,664	27,788	37,250	54,034	67,495	79,571
ENDING YEAR CASH RESERVE	**0**	**0**	**12,344**	**25,148**	**32,664**	**27,788**	**37,250**	**54,034**	**67,495**	**79,571**

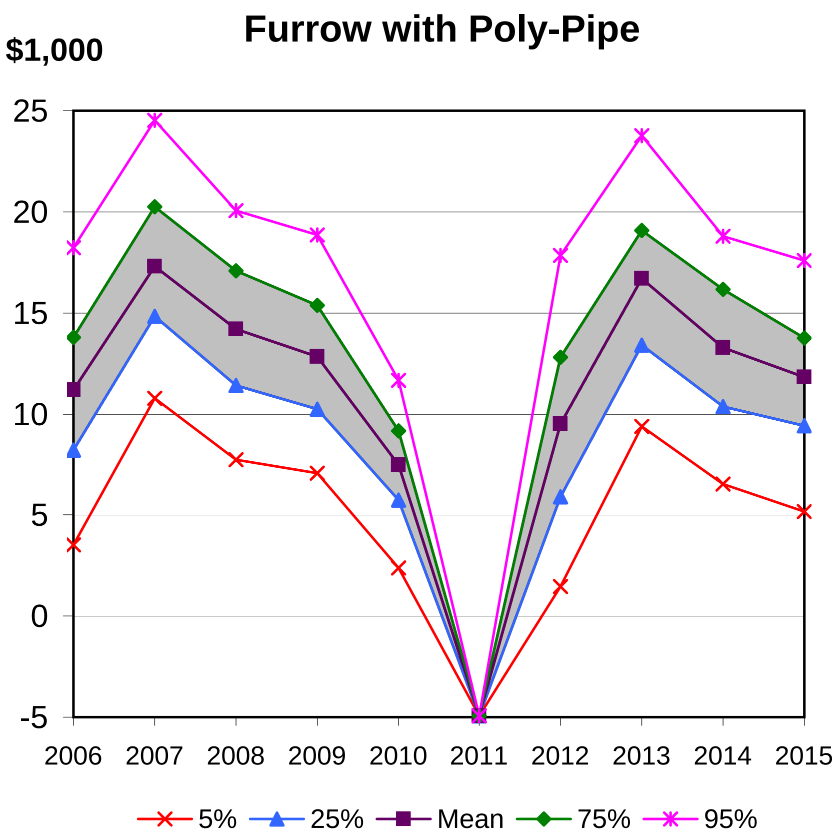
Table 45-3. Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration

	Furrow with Poly-Pipe
Crop Receipts ($1000)	
2006	32.26
2007	29.04
2008	25.87
2009	24.59
2010	19.37
2011	0.00
2012	32.40
2013	29.06
2014	25.82
2015	24.54
2006-2015 Average	**24.29**
Total Cash Receipts ($1000)	
2006	32.26
2007	29.04
2008	25.87
2009	24.59
2010	19.37
2011	0.00
2012	32.40
2013	29.06
2014	25.82
2015	24.54
2006-2015 Average	**24.29**
Total Cash Costs ($1000)	
2006	21.08
2007	11.73
2008	11.66
2009	11.75
2010	11.89
2011	4.93
2012	22.88
2013	12.37
2014	12.54
2015	12.71
2006-2015 Average	**13.35**
Average Annual Operating Expense/Receipts	
2006	0.67
2007	0.41
2008	0.46
2009	0.49
2010	0.63
2011	0.00
2012	0.72
2013	0.44
2014	0.50
2015	0.53
2006-2015 Average	**0.48**
Net Cash Farm Income ($1000)	
2006	11.18
2007	17.31
2008	14.21
2009	12.84
2010	7.48
2011	-4.93
2012	9.52
2013	16.69
2014	13.28
2015	11.83
2006-2015 Average	**10.94**

Table 45-3. Sugarcane, Furrow with Poly-Pipe Demonstration

	Furrow with Poly-Pipe
Prob. Net Cash Income < Zero (%)	
2006	1.00
2007	1.00
2008	1.00
2009	1.00
2010	1.00
2011	99.00
2012	1.00
2013	1.00
2014	1.00
2015	1.00
Prob. of Average Net Cash Farm Income < Zero, 2006-2015 (%)	**10.10**
Ending Cash Reserves ($1000)	
2006	-19.22
2007	-1.91
2008	12.30
2009	25.14
2010	32.65
2011	27.77
2012	37.33
2013	54.10
2014	67.54
2015	79.61
2006-2015 Average	**31.53**

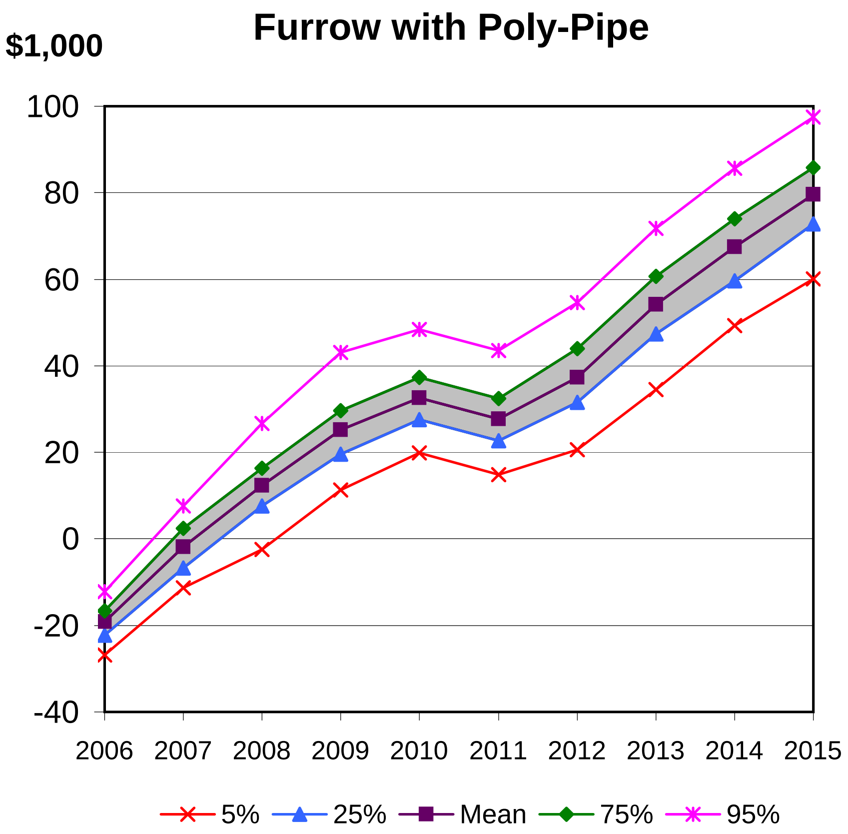
Figure 45-1. Projected Variability in Net Cash Farm Income for Sugarcane, Furrow Irrigation with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Cash Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

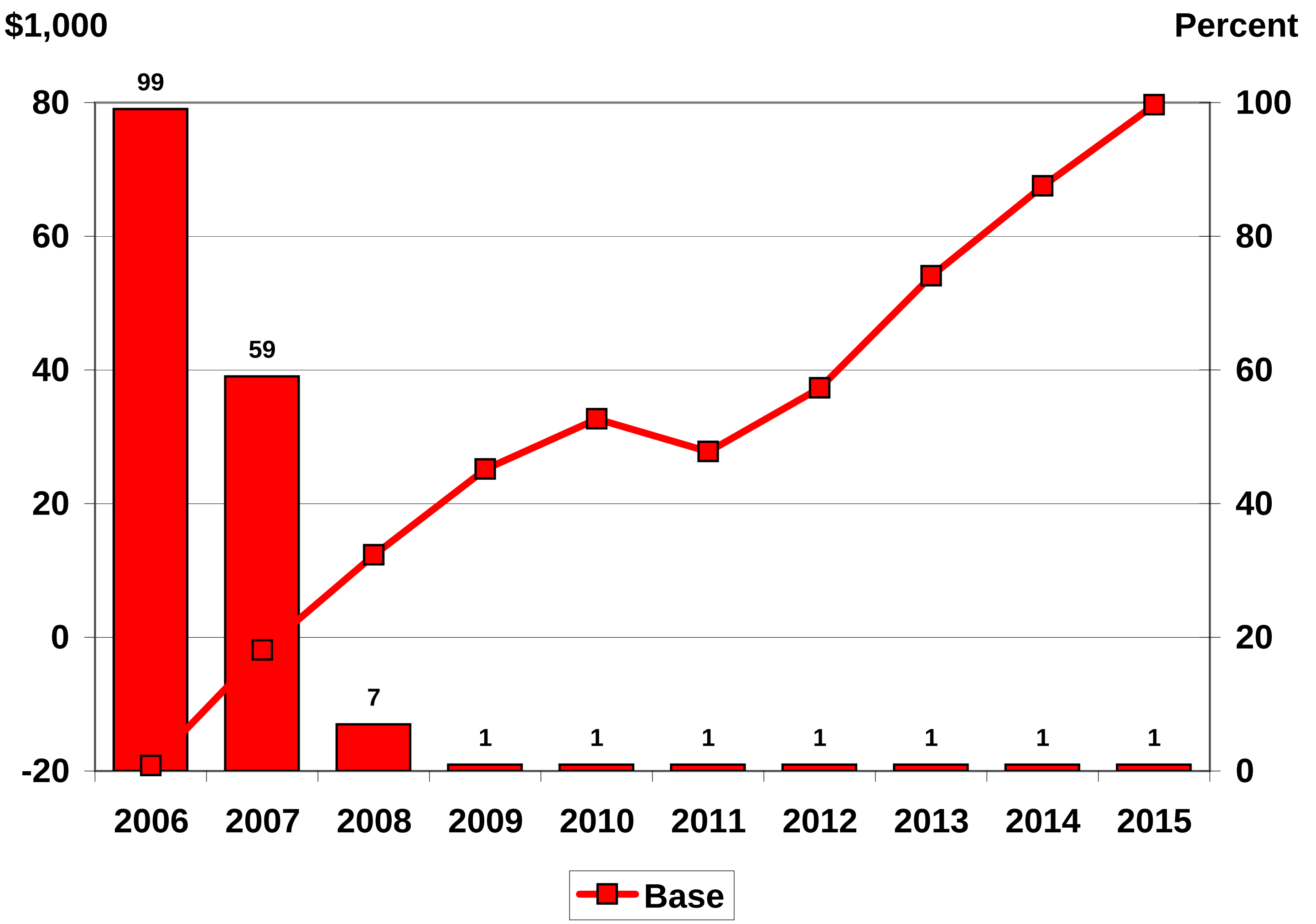
Figure 45-2. Projected Variability in Ending Cash Reserves for Sugarcane, Furrow with Poly-Pipe Demonstration.



Note: Percentages indicate the probability that Net Farm Income is below the indicated level.
The shaded area contains 50% of the projected outcomes.

FARM Assistance
Helping Agriculture Make Informed Decisions

Figure 45-3. Ending Cash Reserves and Probability Cash Shortfall for Sugarcane, Furrow with Poly-Pipe Demonstration.



FARM Assistance

Helping Agriculture Make Informed Decisions

On-Farm Drip and Furrow Flood Irrigation in Annual and Multi-Year Crops

ADI

Annual Report

2006

Submitted by

Texas A&M University-Kingsville, Citrus Center

Dr. Shad Nelson,
Heriberto Esquivel

and

Texas A&M Extension Service, Weslaco, TX
Dr. Juan Enciso

Table of Contents

Drip and Furrow Flood Irrigation in Annual and Multi Year Crops:

Texas A&M University-Kingsville and Texas A&M Extension Service have teamed together to establish various water conservation demonstration sites throughout the Lower Rio Grande Valley (LRGV). The project managers (Dr. Shad Nelson, TAMU-Kingsville and Dr. Juan Enciso, TAES, Weslaco) have made contact with 12 growers/collaborators in the Valley to monitor on farm irrigation at different demonstration sites. These sites encompass a variety of crops including, but not limited to young and mature citrus (grapefruit, orange and tangerine), onions, celery, tomato, corn, cotton and sorghum. Irrigation practices to grow these crops are flood, polypipe furrow/flood, drip, and microjet spray.

Current aim this past year has been to establish contact with collaborators/growers in the LRGV willing to work with us to monitor water use and crop production over a long period of time. This work was initiated in late spring to early summer 2005 where initial cooperation was challenging among growers in the Valley. After several months of developing relationships of trust with Valley growers that informal discussion resulted in more firm collaborative commitments. By the end of 2006 we had 14 committed growers as willing participants to collaborate with us in on farm water conservation demonstration sites. Many of these sites have more than one cropping system for monitoring.

Our initial goals for demonstration sites is not to redirect the water management practices of the growers, so that we can establish a “baseline” data base that represent water use in the Valley. The baseline data will be used to evaluate water consumption per cropping system and irrigation method. It is projected that this collection of baseline data will continue through Project Year 2 (2006). To assist in monitoring water use and crop water consumption each site has been (or is in process of being) equipped with soil moisture sensors with real-time automatic data logging units. On-site rain gauges are also (or will be) supplied and attached to data logging equipment for determination of annual rainfall and for verification of when irrigation events occurred versus rain events. This data will be collected and monitored in tandem with water metering equipment. Water meters are (or will be) supplied at each location to keep track of the quantity of water applied during an irrigation event and over the growing season to each cropping site. The collection of this data is in its initial stages and not a lot of concrete information has been gathered over the past year as the main priority has been to establish new sites and commitments with collaborators.

Current Collaborators:

The following is a list of current collaborators, the types of crops monitored during the fall 2005 and spring 2006 period. The list also covers the type of soil moisture sensing equipment and rain gauge systems in place. Depths of 6”, 12’, and 24”, soil moisture sensors will be placed within the soil profile or bed. Current collaborators under the direction of Dr. S. Nelson (and PhD candidate Ram Uckoo and Eddie Esquivel- Project Coordinator) and Dr. J. Enciso (and science technician Xavier Peries) are listed below.

Field Sites under direction of Dr. Nelson & Eddie Esquivel:

ID ref #01 5 cropping sites
-01a for block ref. Rio Red (narrow borders), 73 acres
-01b for block ref. Valencia (flood); 15 acres
-01c for block ref. Rio Red (narrow borders), 85 acres
-01d for block ref. Onion 2005 White/Red var. (Drip), 12 acres
-01e for block ref. Onion 2005 Yellow var. (Drip), 52 acres
Installed: 2 ECHO probe locations; one rain gauge, 2- WatchDog Data loggers with 3 sensors per site

ID ref #02 3 cropping sites
- 02a for block ref. Rio Red (microjet), Henderson grapefruit (narrow borders), 14 acres
- 02b for block ref. Rio Red (narrow borders), 5 acres
- 02c for block ref. Ruby Red (drip), 4 acres (not working at this time)

Installed: 2 ECHO probe locations; one rain gauge, need to install one location with Installed WatchDog data logger and Watermark sensors, also installed new 10” water meter with one 3” meter on drip location.

ID ref #03 1 cropping sites
- 03a for block ref. Rio Red grapefruit, (traditional flood), 41.3 acres

Installed: ECHO probe in Rio Reds; rain gauge and new Irrometer Watermark monitor with digital readout along with watermark sensors.

ID ref #04 2 cropping sites
- 04a for block ref. Rio Red grapefruit (Drip), Marrs orange, Pineapple orange, Tangerine, 86 acres
- 04b for block ref. Rio Red (Micro-jet), Marrs orange, 30 acres

Installed: 2 ECHO probe locations; 2 WatchDog datalogger w/ Watermark sensor; one rain gauge

ID ref #05 1 cropping sites
- 05a for block ref. White Onions-2.5 acres, yellow and red onions-19.5 acres (Subsurface drip irrigation)

Installed: 1 ECHO probe locations; one WatchDog Rain Logger; one rain gauge

ID ref #06 2 cropping sites
- 06a for block ref. Rio Red Grapefruit (Drip/Microjet Irrigation), 1.1 acres

- 06b for block ref. Rio Red Grapefruit (Traditional Flood), 1.0 acre
Installed: 1 ECHO probe locations; one WatchDog Rain Logger; one rain gauge

Field Sites under direction of Dr. Juan Enciso and Xavier Peires:

ID ref #021 2 cropping sites
-021a for block ref. (2006 Cotton), 3.5 acres
-021b for block ref. Grain Tank (2006 Cotton)**,** 100 acres
ID ref #022 1 cropping sites
-022a for block ref. Honeydews Spring 2006, 3 acres
ID ref #023 1 cropping sites
-023a for block ref. Oranges MJ (2005-2006-2007), 13.4 acres
ID ref #024
-024a for block ref. Rio Red grapefruit (2005-2006-2007), 7 acres **1 cropping sites**
ID ref #025
-025a for block ref. (Onion 2005-2006), 56 acres **1 cropping sites**
ID ref #026
-026a for block ref. (onion 2005-2006), 15.7 acres **1 cropping sites**
ID ref #027 1 cropping sites
-027a for block ref. Irrigation Scheduling SDI Onions 2005-2006, 0.65 acres
ID ref #028 4 cropping sites
-028a for block ref. 68 (MJ Oranges), 8 acres
-028b for block ref. 73 (Drip Grapefruits), 8 acres
-028c for block ref. 74 (MJ Grapefruits), 8 acres
-028d for block ref. 76 (Drip Oranges), 7 acres
ID ref #029 1 cropping sites
-029a for block ref. Low Pressure irrigation SDI - Cotton 2005-2006, 2.6 acres

Project Plans for the Demonstration Sites for Mar 2006-Feb 2007:

All sites require metering devices. This project year will focus on accurate metering of water. Improvement in how metering data is collected will be discussed with the collaborators listed below. Many growers have this equipment, but improvement in data collection and accuracy is needed.

All sites require rain gauge metering devices. This year will focus on installing automatic rain collection at each site.

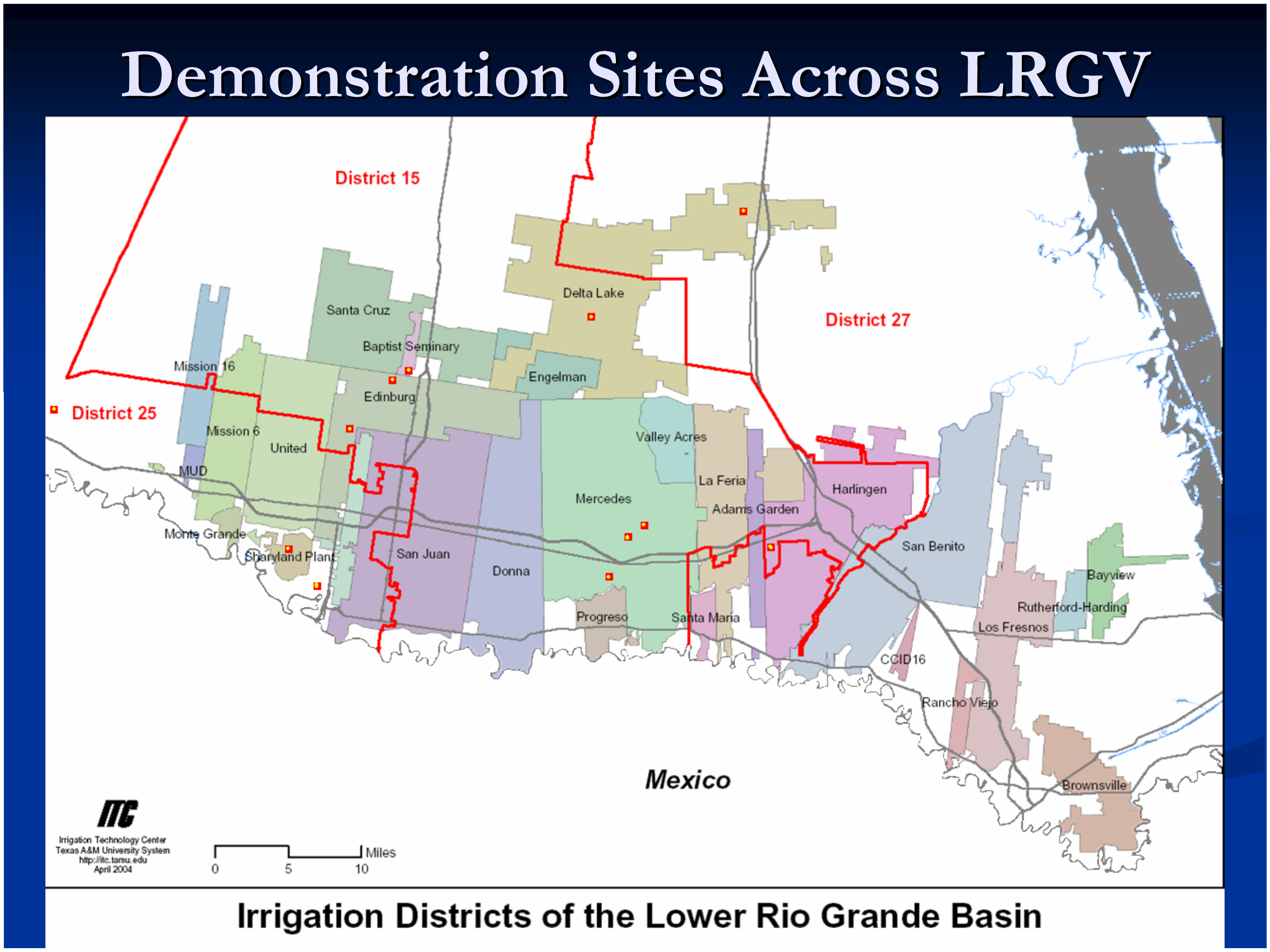
Soil moisture sensing devices will collect data for the purpose of evaluating to what depth irrigation water is moving within different cropping systems and soil types. These soil moisture sensors will also serve as a means of determining when irrigation events occurred and will be used to validate or check against rainfall and water metering data.

Total irrigation and rainfall distribution will be used at the end of the growing season and compiled with harvest data to determine water use efficiency (WUE) and irrigation use efficiency (IUE) for citrus and annual crops in the Valley.

An objective is to compile the data in a GIS program where this data can be displayed for specific locations in the Valley where the demonstration projects are located.

Reporting: A total of two quarterly formal reports were turned into the Harlingen Irrigation District (HID) in August and November 2006 detailing work accomplishments. One informal quarterly report summary was provided to HID.

Map of Demonstration Sites for ADI:



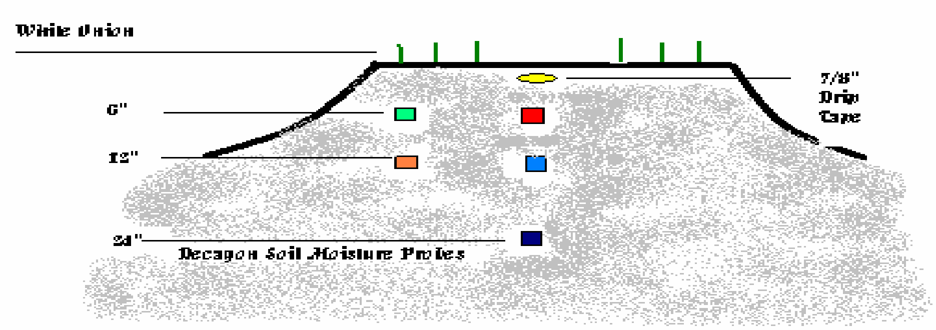
Above: Red dots indicate current collaborators throughout the Lower Rio Grande Valley.

Soil Moisture Determination:

Decagon $ECH_2O^{®}$ probesEC-10 and EM-50 are installed two weeks after initial planting on ADI collaborator #5 from Willacy County.

Above: Decagon data loggers support 5 sensor placement locations (right) and installed in drip irrigated onion bed at ADI collaborator # 5's farm (left).

Below: Sub-surface irrigation- Diagram of fall onions planted in October 2006 by ADI collaborator #05; raised beds with 7/8"diameter, single drip tape located bed center 2" below surface. Soil moisture sensors placed bed center (6", 12", and 24" depths) and edge of bed (6" and 12" depths).



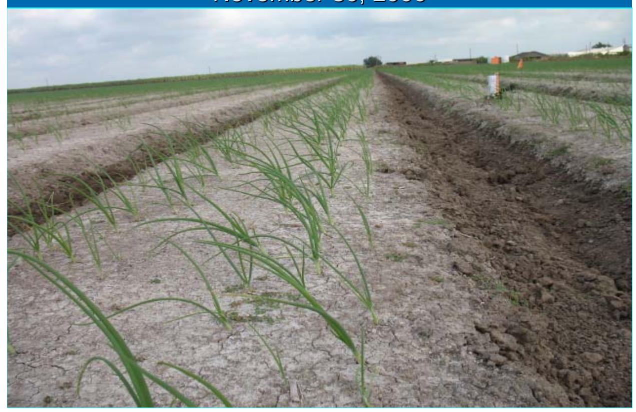
.

ADI Collaborator #05, Willacy County:

Pictorial time-line of onion growth under drip irrigation with Collaborator #5 in Willacy County near Raymondville. White onions planted October 1, 2006 on drip irrigation on a 60” bed, 6 rows, with a center single drip line two inches underground.

Collaborator #5, Willacy County
November 3, 2006

Collaborator #5, Willacy County
November 30, 2006



Collaborator #5, Willacy County
Harvest, March 13, 2007

Collaborator #5, Willacy County
January 10, 2007

Collaborator #02, Hidalgo County:

This particular site has drip, microjet and narrow bordered flood irrigation in close proximity. Agreements to install metering devices should be completed by late March 2007.


Above: Mr. Danny Allen with Harlingen Irrigation District surveys connection line for a 10” metering device.

Below: Neta-fim sprinkler on site #02, microjet location and raised bordered flood both on Rio Red grapefruit fields.


New Signs throughout the Lower Rio Grande Valley:

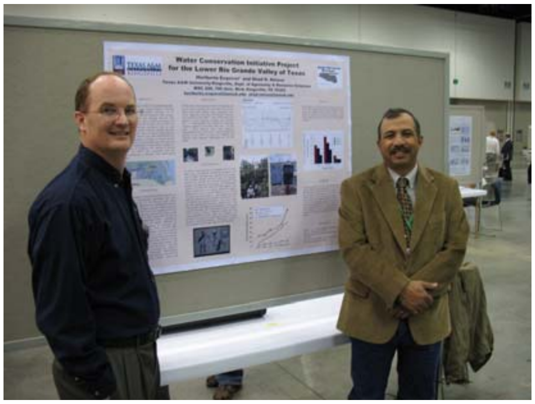
Above: New signs are installed at different sites to signify cooperation with ADI program in LRGV; collaborator #028 (left) and collaborator #02 (right).

Equipment installation on ADI Collaborator Sites:

Below: WatchDog data logger and WaterMark soil moisture sensor installation next to Decagon $ECH_2$0 soil water monitoring equipment on Collaborator #01's farm to help facilitate soil moisture readings for farmer.

ASA-CSSA-SSSA 2006 International Annual Meeting, Indianapolis, Indiana:

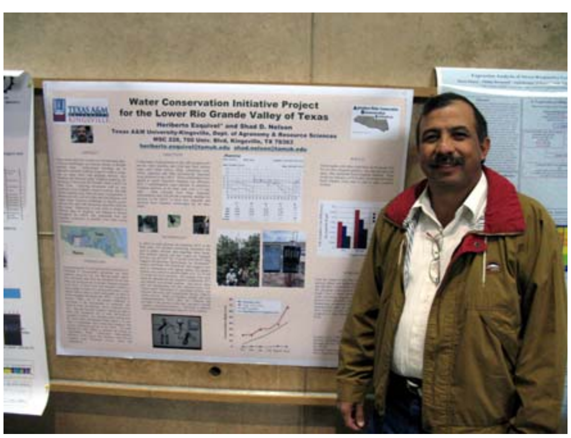
As members of the American Society of Agronomy/ Crop Science Society of America/ and Soil Science Society of America, Dr. Shad Nelson and Heriberto (Eddie) Esquivel presented a poster on Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas representing activities involving ADI project.

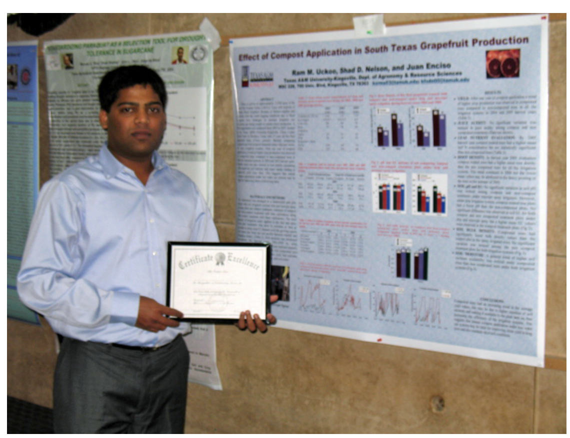


Above: Authors, Dr. Shad Nelson and H. Esquivel pose proudly next to poster in Indianapolis.

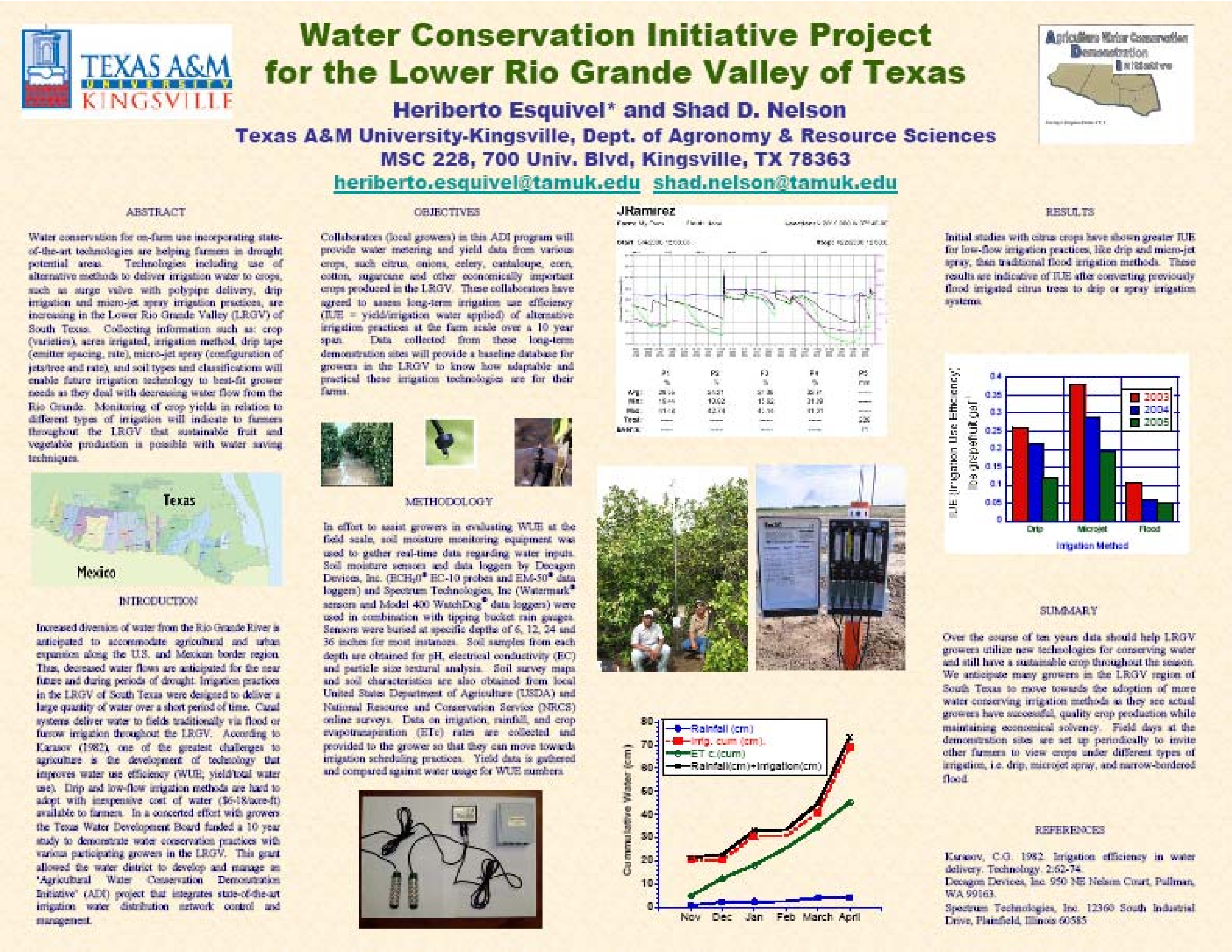
2007 61st Annual Rio Grande Valley Horticultural Society Meeting, Edinburg, TX:

Below: H. Esquivel presents his poster, Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas and Rammohon Uckoo stands by his 1st place poster titled- Effect of Compost Application in South Texas Grapefruit Production, utilizing drip and microjet irrigation as water conservation techniques. Research was completed on ADI collaborator site #06 and funded by Rio Grande Basin Initiative. Ram is currently attending Texas A&M University working on his Ph.D.

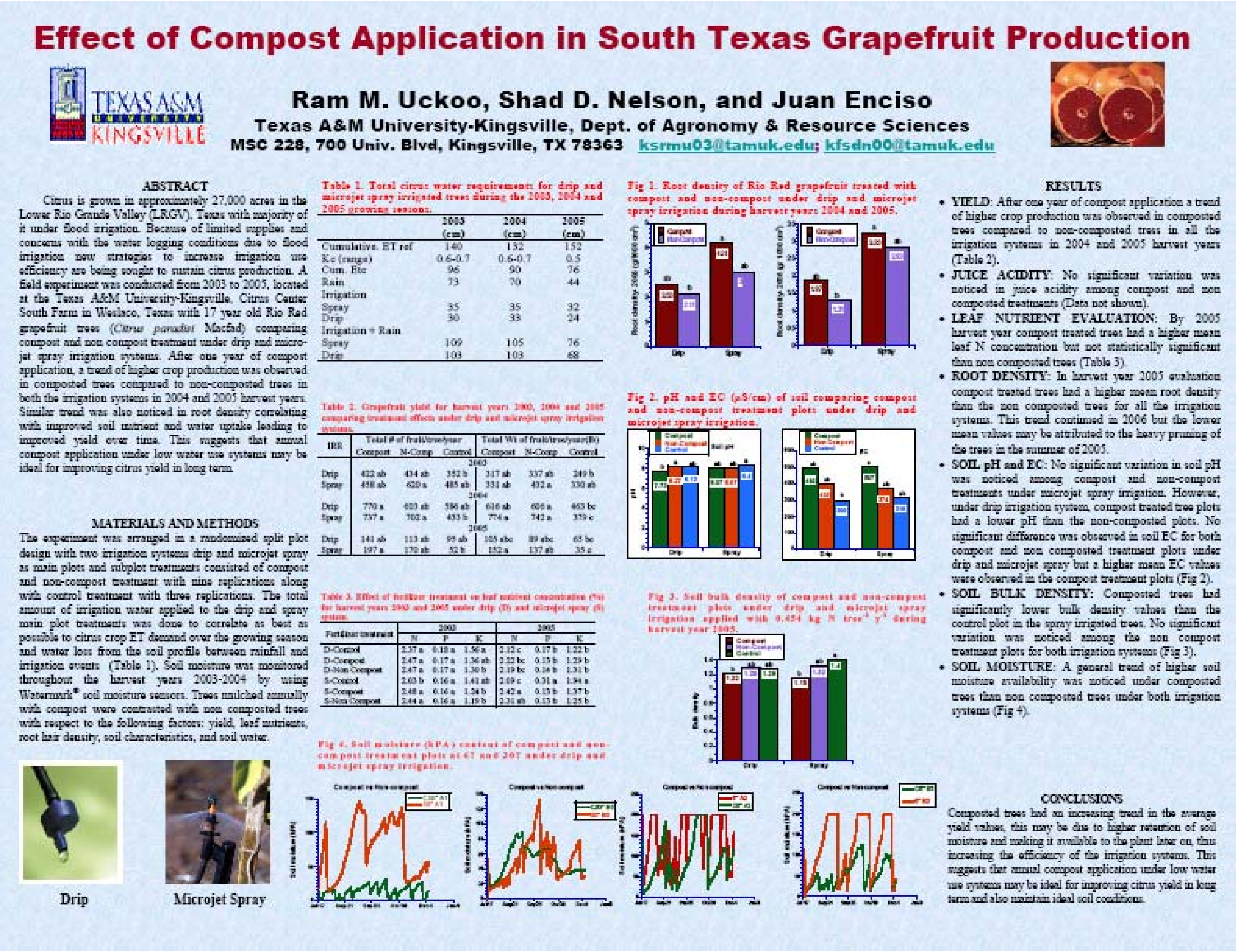




H. Esquivel's ADI poster, presented at the ASA-CSSA-SSSA 2006 International Annual Meeting, Indianapolis, Indiana:



Rammohan Uckoo's 1st Place poster at Rio Grande Valley Horticultural Society Meeting at Edinburg, TX:



Rainfall Totals for East/West Ends of Lower Rio Grande Valley 2005-2006:

Average annual rainfall within the LRGV is approximately 25 inches. This past 2005 year the Valley experience below average rainfall. Below is an example of rainfall for two ends of the LRGV.

Monthly Rain Totals for McAllen

Totals 2006			Totals 2005		
	inch	cumulative		inch	cumulative
Jan	0.08	0.08	Jan	1.02	1.02
Feb	0.13	0.21	Feb	0.96	1.98
Mar	0.55	0.76	Mar	0.4	2.38
April	0.01	0.77	April	0.02	2.4
May	0.73	1.5	May	1.78	4.18
June	0.35	1.85	June	0.5	4.68
July	3.4	5.25	July	7.37	12.05
Aug	0.76	6.01	Aug	1.85	13.9
Sept	11.22	17.23	Sept	1.08	14.98
Oct	1.73	18.96	Oct	1.34	16.32
Nov	0.1	19.06	Nov	0.4	16.72
Dec	2.73	21.79	Dec	0.48	17.2
	21.79	Total 2006 year		17.2	Total 2005 year

Monthly Rain Totals for Harlingen

Totals 2005			Totals 2006		
	inch	cumulative		inch	cumulative
Jan	0.34	0.34	Jan	0.24	0.24
Feb	1.07	1.41	Feb	0.06	0.3
Mar	0.21	1.62	Mar	2.03	2.33
April	0.18	1.8	April	0.04	2.37
May	1.75	3.55	May	3.16	5.53
June	0.14	3.69	June	0.46	5.99
July	4.08	7.77	July	2.41	8.4
Aug	0.32	8.09	Aug	2.04	10.44
Sept	2.77	10.86	Sept	4.88	15.32
Oct	2.37	13.23	Oct	3.88	19.2
Nov	1.47	14.7	Nov	0.34	19.54
Dec	0.92	15.62	Dec	3.22	22.76
	15.62	Total 2005 year		22.76	Total 2006 year

Harvest Yields and Irrigation Totals:

This year we used on-site information of 2005-2006 harvest years (chart below), with two of the collaborator sites; site #01a (narrow bordered flood w/ polypipe) and site #028c (microjet). These two demonstration sites are relatively close (approximately 20 miles) to each other, rainfall amounts and soil properties are also similar.
IUE (irrigation use efficiency) and WUE (water use efficiency) numbers using pounds per acre inch, per tree comparing narrow bordered flood verses microjet irrigation, indicated better efficiencies with microjet irrigation. Total irrigation and rain in gallons per acre were significantly lower with microjet irrigation.
Due to scheduling differences between annual reports and citrus harvest events, for 2007 have not been received for this annual report.

Citrus Harvest Years 2005-2006: Rio Red Grapefruit

Assuming 27,000 citrus acres in LRGV under Microjet

Saved: Microjet vs Flood	Total Acreage LRGV	
gallons/ac	gallons	ac/ft
1.118E+06	3.018E+10	9.261E+04

Collaborator: #01
Block #106-107, Rio Red Grapefruit
73 acres Narrow Bordered Flood (Polypipe)

IUE (yield/irr)	WUE (yield/(irr+rain))	IUE (yield/tree)	WUE (yield/tree(irr+rain))	Total Irr+Rain
[lbs/ac.in]	[lbs/ac.in]	[lbs/in-tree]	[lbs/in-tree]	[gallons/acre]
1029.83	696.20	8.96	6.05	1.395E+06

Collaborator: #28
Block #74, Rio Red Grapefruit
8 acres Microjet irrigation

IUE (yield/irr)	WUE (yield/(irr+rain))	IUE (yield/tree)	WUE (yield/tree(irr+rain))	Total Irr+Rain
[lbs/ac.in]	[lbs/ac.in]	[lbs/in-tree]	[lbs/in-tree]	[gallons/acre]
1882.72	972.89	16.23	8.39	2.770E+05

ADI Collaborator #021 Cotton Harvest 2006, Stress Irrigation vs. Conventional Irrigation:

Difference: Stress vs. Conventional Irrigation	Acreage	Irrig-Total (Gal/acre)	Yield-Total (lbs/ac)	Irrig-Total ac. In./ac	IUE (yield/irr) [lbs/ac.in]	WUE (yield/(irr+rain)) [lbs/ac.in]	
317,332	3	977,553	571.00	126	31.72	19.16	Stress Irrig.
Gallons of water saved per acre	183.1	59,663,318	820.00	219,728	37.27	24.6	Conv. Irrig.

Above: On sandy loam soil, two sites, 3.5 acres (stress irrigation) and 100 acres (conventional irrigation) was studied during 2006. Both sites were planted in February and harvested in July of 2006 at 52,000 plants per acre on 40 inch beds. Furrow irrigation with polypipe was utilized on both sites. Irrigation Use Efficiency (IUE) and Water Use Efficiency (WUE) numbers were lower on the stress irrigated plots although the total yield was 30% higher with conventional irrigation water amounts.

Below: Information on Musk Melon, *var*. Honey Brews, in Hidalgo County. No comparison values available at this time.

	Collaborator #22, Hildalgo County, Musk Melon (Honey Brews)					
Acreage	Acre Foot per Acre	Irrig-Total (Gal/Acre)	Irrig-Total (ac.in/ac)	Yield-Total (lbs./ac)	IUE (yield/irr) (lbs/ac.in)	WUE (yd/(irr+rain)) (lbs/ac.in)
3	0.83	269,293	269,262	39,000	3,933	3,477

Planting and soil characteristics below on Musk Melon crop:

Crop Characteristics	Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrigation Type
		Watermark sensors			
Planted on 02/13/06	Sand %	37.76	36.76	31.76	Sub-surface Drip
Harvested from	Silt %	45.72	48.72	53.72	
05/10 to 05/30/06	Clay %	16.52	14.52	14.52	
80-inch beds	Soil Type	Loam	Loam	Silt Loam	
	LaGloria S. Lm. (90%) & Rio Grande S. Lm. (10%)				
	BD (g/cm3)	1.10	1.33	1.18	
	FC	28.4	27.0	28.8	
	PWP	12.1	11.0	11.0	
	PAW (FC-PWP)	16.3	16.0	17.8	

ADI Collaborator's Onion Sites of the LRGV- Sub Surface Drip:

Acreage	Acre Foot per Acre	Irrig-Total (Gal)	Irrig-Total (ac.in/ac)	Yield-Total (lbs./ac)	IUE (yield/irr) (lbs/ac.in)	WUE (yd/(irr+rain)) (lbs/ac.in)
Collaborator #025a, Starr County, Yellow Onions						
56.0	2.0	36,081,481.2	23.7	37,000.0	1,559.3	1,239.6
Collaborator #026a, Hidalgo County, Yellow Onions						
15.7	1.3	6,464,883.8	15.6	48,336.0	3,187.4	2,900.5
	Collaborator #01e, Hidalgo County, Yellow Onions					
52.0	1.1	18,937,743.2	13.4	32,000.0	2,386.0	1,099.2

Examples of Soil Characteristics, Sensor Placement and Planting Information of ADI Collaborators:

Soil Information for Collaborator #025:

Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrig Type/ Information
	Watermark sensors			
Sand %	17.12	17.12	12.40	Sub-surface Drip
Silt %	42.72	42.72	45.44	Planted on 10/11/05
Clay %	40.16	40.16	42.16	Harvested on 04/15/06
Soil Type	Silty Clay	Silty Clay	Silty Clay	80-inch beds
LaGloria S. Lm. (78%), Rio Grande S. Lm. (17%) & Camargo Silty C. Lm. (5%)				
BD (g/cm3)	1.01	1.25	1.46	
FC	38.9	38.9	39.9	
PWP	24.3	24.3	25.2	
PAW (FC-PWP)	14.6	14.6	14.7	

Soil Information for Collaborator #026:

Soil Characteristics	6" sensor	12" sensor	18" sensor	Irrig Type/ Information
	Watermark sensors			
Sand %	61.12	61.12	56.40	Sub-surface Drip
Silt %	22.72	20.72	19.44	
Clay %	16.16	18.16	24.16	
Soil Type	Sandy Lm.	Sandy Lm.	Sandy C. Lm.	
Brennan Fine Sandy Lm. (85%), Rio C. Lm. (12%) & Hidalgo Sandy C. Lm. (3%)				
BD (g/cm3)	1.39	1.53	1.66	
FC	21.8	22.8	26.9	Planted on 10/13/05
PWP	11.5	12.6	16.0	Harvested on 03/21/06
PAW (FC-PWP)	10.3	10.2	10.9	40-inch beds

Soil Information for Collaborator #01:

Soil Characteristics	6" sensor	12" sensor	24" sensor	36" sensor	Irrig Type/Information
pH	7.7	7.6	7.7	7.8	Drip
EC (dS/m)	1.02	1.24	5.17	4.58	80 inch center-to-center beds
Sand %	33.12	35.12	47.12	34.24	1 drip tape/bed
Silt %	38	36	33.28	41.6	tape buried 6 to 8 inches
Clay %	28.88	28.88	19.6	24.16	18 inch emitter spacing
Soil Type (PSA)	Clay loam	Clay loam	Loam	Loam	0.4 gal/hr rate
BD (g/cm3)	n/a	n/a	n/a	n/a	6 rows onions / bed
FC	36	36	27	27	
PWP	23	23	13.4	13.4	
PAW (FC-PWP)	13	13	13.6	13.6	

ADI exposure to media and other external groups (not using ADI funds):

Dr. Shad Nelson was interviewed on Channel 6- Morning Show, of Corpus Christi, TX on the goals and importance of water saving techniques used in irrigation of the Rio Grande Valley.

Traveled to Indianapolis, Indiana on November 12, to present poster on Agricultural Demonstration Initiative project at the International ASA-CSSA-SSSA Annual Conference.

Eddie Esquivel presented ADI poster (non-competition) at the University of Texas at Pan-Am in Edinburg, TX for the 61st Annual Rio Grande Valley Horticultural Society meeting. Water Conservation Initiative Project for the Lower Rio Grande Valley of Texas.

Rammohon Uckoo, Ph.D. candidate, TAMU, won first place in poster competition with his poster on Effect of Compost Application in South Texas Grapefruit Production. The 61st Annual Rio Grande Valley Horticultural Society meeting.

Uckoo, R.M., S.D. Nelson, K.J. Shantidas, and J.M. Enciso. 2005 (published Oct 2006). Irrigation and fertilizer efficiency in South Texas grapefruit production. Subtropical Plant Science. Journal of the Rio Grande Valley Horticultural Society. 57:23-28. This is a publication originating from a water conservation project located at South Farm in Weslaco, TX comparing flood, drip and microjet spray on Rio Red grapefruit.

Total Funds Spent on ADI Project from Feb. '05 to May '07:

Total funds spent on ADI project (Feb 2005-May 2007)	ADI Funds		TAMUK Funds
Wages	$92,406.46		$74,254.36
Supplies/Equipment	$21,718.38		$25,060.94
Travel Expenses	$6,002.18		$19,770.77
Total	**$120,127.02**		**$119,086.07**
This list does not include any funds donated by TAES- Dr. Juan Enciso such as labor, gas, supplies, travel, etc.			

Budgetary Expenditures during Years 1 & 2 of ADI project for TAMUK:

TAMUK Sub-contract Budget	Year 1 2/15/05-2/14/06	Amendment # 1 2005	Year 1 2/15/05-2/14/06	Amendment # 2 2/15/06	Years 1&2 2/15/05-5/31/07	Years 1&2 2/15/05-5/31/07
	Total Original Amount	Total Amount Decrease	Total Adjusted Amount	Total Amount Increase	Total Adjusted Amount	Total Amount Spent
Salary & Fringe	51,214.00	0	51,214.00	52,547.00	103,761.00	90,398.50
Travel	6,000.00	0	6,000.00	0	6,000.00	6000.00
Operational Supplies	22,750.00	-10,007.00	12,743.00	0	12,743.00	11,672.14
Total	79,964.00		69,957		122,504.00	102,070.64

Additional Matching Funds brought to ADI Projects during Year 2:

Other grant funds:

$16,500. Rio Grande Basin Initiative, Task 4: "On-Farm Irrigation System Management". Money pays for one ADI demonstration site and labor associated with this demonstration site located in Weslaco, TX.

Other donated sources:

Salaries for Xavier Périès, Juan Ramirez and Dr. Juan Enciso at Texas Agricultural Experiment Station, Weslaco, TX. These people are currently collecting data for this project without monetary reimbursement. Dollar amount unknown, but substantial.
Dr. Kim Jones and Irama Wesselman from the Dept. of Environmental Engineering at TAMUK contributed their paid time to consult and analyze soil moisture data.

$5,340. Mileage for Department of Agronomy & Resource Science truck donated and paid by departmental annual budget. With approximately 30 trips to the Lower Rio Grande Valley per year and approximately 400 miles per trip visiting ADI collaborators, this equates to approximately 12,0,000 miles driven during project Year 2 from Feb 2006 to Feb 2007. At 44.5 cents/mile this equals $5,340.00 in gas and maintenance associated with the truck that is not assessed against the ADI budget.

Current Assessment Questions for ADI projects under TAMUK:

How is the data being collected and how is it being stored?
Data from soil moisture sensing equipment and rain gauges at the afore-mentioned sites are being handled by Dr. Nelson's group (Ram Uckoo, Eddie Esquivel) and Dr. Enciso's staff (Xavier Peires) working on this project: and. Dr. Nelson's group handles 6 locations, while Dr. Enciso's group handles 8 locations. The data is collected in the field, stored temporarily on a laptop computer or Personal Digital Assistant (PDA), and then transferred to another computer at the research station/lab in Kingsville or Weslaco.

How will the data be made available to other growers?
Data downloaded will be delivered to Harlingen Irrigation District and Tom McLemore to make the data available on the hidcc1.org website, where soil moisture monitoring and rainfall data will be collected for growers to see.
ADI Collaborators will provide us with harvest, fertility, and input data respective to their ADI demonstration site. This information will be made available on the hidcc1.org website.

What are the ultimate goals of data collection?
We anticipate correlating water use from various irrigation systems with current irrigation practices used by growers. Initially soil moisture monitoring with evaluate where and to what depth water is moving within the soil profile. Also, correlate ET demand and crop water use (where in the rooting zone is water being taken), so that in the near future we can grasp better how much of the soil profile needs to be recharged during each irrigation cycle under drip, microjet, furrow, and flood irrigation practices. This work will be examined in relationship to soil type and location within the Lower Rio Grande Valley (LRGV).

What is the plan for 2007?
Install water meters by late March, on Sharyland Orchards to utilize three different types of irrigation on one site; microjet, drip, and narrow bordered flood.
Collect basic bulk density figures for each collaborator cropping site for evaluation of water percolation.
Continue relationship with established collaborators and install purchased soil moisture monitoring equipment, rain gauges and most importantly focus on accurate water metering (supplying meters to collaborators, if needed).
Monitor soil quality parameters under low-water use irrigation systems over time. Such as, evaluation of soil salinity increases under drip or microjet irrigation vs. flood in the Lower Rio Grande Valley.
Establish the baseline irrigation needs for growers involved in demonstration sites, and evaluate water and irrigation use efficiency from these locations.

Increase Heriberto Esquivel to TAMUK ADI Project Manager to oversee graduate and undergraduate student laborers involved in project data collection and managing data collection with ADI collaborators/growers.

Harlingen Irrigation District Agricultural Water Conservation Demonstration Initiative

HID, TAMUK, TCE Combined Demonstration Site Summaries For the 2006 Growing Season

Table of Contents

1. Site Summary Introduction

The following pages contain summaries of the demonstration sites maintained by all entities involved in the Agricultural Water Conservation Demonstration Initiative. Each site is designated by a site number, these site designations were developed to maintain the anonymity of the producers involved in the program. The first digit is the entity responsible for gathering data from the site, the second digit is the producer, and the third digit is a letter designating the field within the site. Site numbers beginning with "0" or "1" are maintained by Texas A&M University-Kingsville under the direction of Dr. Shad Nelson. Site numbers beginning with "2" or "3" are maintained by Texas A&M Extension Center under the direction of Dr. Juan Enciso. The sites beginning with "4" or "5" are maintained by Harlingen Irrigation District under the direction of Danny Allen. The economic summaries are provided by Texas A&M Extension FARM Assistance under the direction of Dr. Steven Klose and Mac Young. The sites numbers funded primarily from ADI funds are TAMU-Kingsville sites 01 thru 05 and Harlingen Irrigation District sites 41-45, and 47. All other site numbers 06, 07, 21 thru 29 are primarily funded by the Rio Grande Basin Initiative, TAES, TAMU-Kingsville Citrus Center, USDA-CSREES, or other funding sources.

The demonstration sites under the direction of Dr. Juan Enciso are funded through the Rio Grande Basin Initiative (RGBI). The ADI project has been able to establish a cooperative agreement with Dr. Enciso to provide RGBI site data at no cost to the ADI project. Dr. Enciso has played a vital role in the water management workshops and technical advice for the ADI demonstration sites.

2. Site: #01A – 2005-06

Site Description:

Acres: 73.0
Soil type: clay loam 0-6 inches, sandy clay loam 6-36 inches
Crop variety: Rio Red grapefruit
Harvest season: May 05-Apr 06
Irrigation district: None-Class B water owner

Irrigation system:

Narrow bordered flood, polypipe
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: 1100 lbs/A 12-24-12 split application 2 times per year
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", and 24" depths; ECRN-50 Rain gauge. Turbine-type flow meter

Irrigation schedule and amounts:

Total irrigation: **2.89 ac-ft/ac** or **34.7 ac-in/ac** (approximation)
Total rainfall: 16.6 inches
Total water input: 51.36 inches/acre (approximation)

Irrigation method:

Farmer reforms raised berms between rows after each harvest. These berms aid in channeling water at a faster rate to the end of the bed as a potential water conserving irrigation method for flood irrigating mature citrus. Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Water metered on site using a 10 inch water meter and cross checked against water meter located at uplift pump station.

Observations made during the crop season:

Initial year of working with this grower starting accurate metering in November 2005, so early irrigation data prior to this time during this harvest season is an approximation. Crop harvested later in season than desired by grower, April 2006.

Yield:

Total: 1305.2 tons or 17.9 tons/Ac; 69% fresh pack and 31% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **8.96 lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **6.18 lbs/inch per tree** (irrigation + rainfall)

3. Site: #01A – 2006-07

Site Description:

Acres: 73.0
Soil type: clay loam 0-6 inches, sandy clay loam 6-36 inches
Crop variety: Rio Red grapefruit
Harvest season: May 06-May 07
Irrigation district: None-Class B water owner

Irrigation system:

Narrow bordered flood, polypipe
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: 600 lbs/A 12-24-12, late April '06; 500 lbs/A 12-24-12, early Dec '06; 10 gal/A 20-0-0-40 late July and early Sept.'06; 8 gal/A 20-0-0-40 early Nov. 2006
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", and 24" depths; ECRN-50 Rain gauge. 10 inch Turbine-type flow meter

Irrigation schedule and amounts:

Total irrigation: 7 irrigation events
Total rainfall: 40.05 inches
Total water input:

Irrigation method:

Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using raised berms in between rows (Grapefruit). Farmer reforms raised berms after each harvest in order to channel water at a faster rate to the end of the bed as a potential water conserving irrigation method for flood irrigating mature citrus.

Observations made during the crop season:

Low rainfall throughout the summer months, with a large portion of annual rainfall coming in the month of September. The heavy rains during September (11.2 inches) may have affected sugar composition of Rio Red grapefruit. Fruit harvested in May 2007.

Yield:

Total: ? tons or ? tons/Ac; ?% fresh pack and ?% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently Lacking final irrigation and May harvest '07 data

Economic Summary: Demonstration Site 1A

The Demonstration Site 01A analysis consists of a 10-year financial outlook (2006-2015) for the 73 acres of Rio Red grapefruit under narrow border flood irrigation. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $200/ton. 2006 producer costs and overhead charges are producer estimated rates.

Total cash receipts average $3,606/acre over the 10-year period and cash costs average $1,260/acre, including $100/acre irrigation costs. Net cash farm income (NCFI) averages $2,346/acre due largely to the price being held at a constant $200/ton. The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $274/acre to $4,849/acre.

4. Site: #01B – 2005-06

Site Description:

Acres: 15.0
Soil type: clay loam 0-18 inches, loam 18-36 inches
Crop variety: Valencia oranges
Harvest season: May 05-Apr 06
Irrigation district: None-Class B water owner

Irrigation system:

Narrow border flood, polypipe
Irrigation method: Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using berms in between rows (Valencia).
Field characteristics: 15' x 23' spacing (124 trees/Acre)
Fertilizer applied: 500 lbs/A 12-24-12 Early May '06; then several 5 gal/A applications of 20-0-0-40 throughout growing season (May, June, July 2006) and 7 gal/A N32 (Nov 2006)
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", and 24" depths; and ECRN-50 Rain gauge located on adjacent Site #01C.
Turbine-type flow meter

Irrigation schedule and amounts:

Total irrigation: **1.91 ac-ft/ac** or **22.9 ac-in/ac** in 7 irrigation events (estimated)
Total rainfall: 16.6 inches
Total water input: 39.5 inches/acre (estimated)

Irrigation method:

Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using raised berms in between rows (Oranges). Farmer reforms raised berms after each harvest in order to channel water at a faster rate to the end of the bed as a potential water conserving irrigation method for flood irrigating mature citrus.

Observations made during the crop season:

Valencia oranges are located in same irrigation block as Rio Red grapefruit site #01C with similar soil characteristics. Citrus was harvested April 2006.

Yield:

Total: 115.0 tons or 7.7 tons/Ac

Water use summary:

Irrigation use efficiency (IUE): **5.41 lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **3.13 lbs/inch per tree** (irrigation + rainfall)

5. Site: #01B – 2006-07

Site Description:

Acres: 15.0
Soil type: clay loam 0-18 inches, loam 18-36 inches
Crop variety: Valencia oranges
Harvest season: May 06-May 07
Irrigation district: None-Class B water owner

Irrigation system:

Narrow border flood, polypipe
Irrigation method: Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using berms in between rows (Valencia).
Field characteristics: 15' x 23' spacing (124 trees/Acre)
Fertilizer applied: 500 lbs/A 12-24-12 Early May '06; then several 5 gal/A applications of 20-0-0-40 throughout growing season (May, June, July 2006) and 7 gal/A N32 (Nov 2006)
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", and 24" depths; and ECRN-50 Rain gauge located on adjacent Site #01C.
Turbine-type flow meter

Irrigation schedule and amounts:

Total irrigation: 7 irrigation events
Total rainfall: 40.05 inches
Total water input: Unknown

Irrigation method:

Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using raised berms in between rows (Oranges). Farmer reforms raised berms after each harvest in order to channel water at a faster rate to the end of the bed as a potential water conserving irrigation method for flood irrigating mature citrus.

Observations made during the crop season:

Low rainfall throughout the summer months, with over 50% of annual rainfall coming in the month of September. The heavy rains during September (11.2 inches) may have affected sugar composition of Rio Red grapefruit.

Yield:

Total: ? tons or ? tons/Ac; ?% fresh pack and ?% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

Economic Summary: Demonstration Site 01B

The Demonstration Site 1B analysis consists of a 10-year financial outlook (2006-2015) for the 15 acres of Valencia oranges under narrow border flood irrigation. The orchard was assumed to be five years old. The Valencia orange price is held constant at $150/ton. 2006 production costs and overhead charges are producer estimated rates.

Total cash receipts average $2,103/acre over the 10-year period and cash costs average $1,199/acre, including $100/acre irrigation costs. Net cash farm income (NCFI) averages $904/acre due largely to the price being held at a constant $150/ton and increasing yields through 2009 as trees mature. The risk associated with prices and yields suggests a 17.3% chance of negative NCFI. In a normal production year, NCFI could range as much as -$733/acre to $3,000/acre. Reflecting the potential of negative NCFI, the probability of carryover debt is 22% in 2007 and then declines to 2% or less by 2013.

6. Site: #01C – 2005-06

Site Description:

Acres: 85.0
Soil type: clay loam 0-18 inches, loam 18-36 inches
Crop variety: Rio Red grapefruit
Harvest season: May 05-Apr 06
Irrigation district: None-Class B water rights owner

Irrigation system:

Narrow bordered flood, polypipe
Field characteristics: 15’ x 24’ spacing (115 trees/Acre)
Fertilizer applied: 500 lbs/A 12-24-12 Early May ’06 and several applications of 20-0-0-40 5 gal/A throughout growing season
Sensor information: Soil moisture: Not measured within this grove, but located on adjacent Site #01C are Decagon data logger EM-50, ECHO-10 probes, Probes set at 6”, 12”, and 24” depths; and ECRN-50 Rain gauge.
Turbine-type flow meter

Irrigation schedule and amounts:

Total irrigation: **1.91 ac-ft/ac** or **22.9 ac-in/ac** in 7 irrigation events (estimated)
Total rainfall: 16.6 inches
Total water input: 39.5 inches/acre (estimated)

Irrigation method:

Farmer uses 12” concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using raised berms in between rows (Grapefruit). Farmer reforms raised berms after each harvest in order to channel water at a faster rate to the end of the bed as a potential water conserving irrigation method for flood irrigating mature citrus.

Observations made during the crop season:

Drought conditions throughout the summer months. Rainy season starting in September 2006.

Yield:

Total: 1460.1 tons or 17.2 tons/Ac; 69% fresh pack and 31% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **13.1 lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **7.6 lbs/inch per tree** (irrigation + rainfall)

7. Site: #01C- 2006-07

Site Description:

Acres: 85.0
Soil type: clay loam 0-18 inches, loam 18-36 inches
Crop variety: Rio Red grapefruit
Harvest season: May 06-May 07
Irrigation district: None-Class B water owner

Irrigation system:

Narrow bordered flood, polypipe
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: 500 lbs/A 12-24-12 Early May '06; then several applications of 20-0-0-40 5 gal/A throughout growing season (May, June, July 2006) and 7 gal/A N32 (Nov 2006)
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6", 12", and 24" depths; and ECRN-50 Rain gauge located on adjacent Site #01C.
Turbine-type flow meter

Irrigation schedule and amounts:

Total irrigation: 7 irrigation events
Total rainfall: 40.05 inches
Total water input: ? inches/acre

Irrigation method:

Farmer uses 12" concrete outlet valve and attaches turbine meter to valve and poly-pipe. Farmer waters only directly under the canopy (root zone) by using raised berms in between rows (Grapefruit). Farmer reforms raised berms after each harvest in order to channel water at a faster rate to the end of the bed as a potential water conserving irrigation method for flood irrigating mature citrus.

Observations made during the crop season:

Drought conditions throughout the summer months. Rainy season starting in September 2006.

Yield:

Total: ? tons or ? tons/Ac; ?% fresh pack and ?% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

Economic Summary: Demonstration Site 1C

The Demonstration Site 1C analysis consists of a 10-year financial outlook (2006-2015) for the 85 acres of Rio Red grapefruit production under narrow border flood irrigation. The orchard was assumed to be 5 years old. The Rio Red grapefruit price is held constant at $200/ton. 2006 production costs and overhead charges are producer estimated rates.

Total cash receipts average $4,426/acre over the 10-year period and cash costs average $1,204/acre, including $100/acre irrigation costs. Net cash farm income (NCFI) averages $3,222/acre due largely to the price being held at a constant $200/ton and increasing yields from maturing trees. The risks associated with prices and yields suggest a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $388/acre to $6,600/acre.

8. Site: # 01D – 2005-06

Site Description:

Acres: 12.0 (6 ac red, 6 ac white)
Soil characteristics: Rio Grande silt loam
Crop variety: White/Red Onion
Harvest season: Oct 05-Mar 06
Irrigation district: None-Class B water owner

Irrigation system:

Sub-surface drip,
Field characteristics: Onions planted mid Oct '05, harvested mid Mar '06
48 inch beds, 80 inch center-to-center;
6 onion lines per bed
Fertilizer applied: unknown
No soil moisture sensors installed in this site; sensors installed at demo site #01E on yellow onions grown during same growing season.

Irrigation schedule and amounts:

Total irrigation: **1.12 ac-ft/ac** or **13.4 ac-in/ac** in 12 irrigation events
Total rainfall: 3.3 inches
Total water input: 16.70 inches/acre

Irrigation method:

Drip tape buried center of bed, 6 to 8 inches deep, with 18 inch emitter spacing at 0.4 gpm. Irrigation scheduling was not based on soil moisture monitoring but by grower experience. Irrigated using a portable sand filter/ pump combination and metered each time.

Observations made during the crop season:

Information on these onions was provided at the end of the season. This was not a designated "demo site", but the yield and irrigation data were collected, thus we have presented them here in case future years include red and white onions for comparisons.

Yield:

Total: 3102 50-lbs bags or 517 bags/ac red onions; 5153 50-lbs bags or 859 bags/ac white onions

Water use summary:

Irrigation use efficiency (IUE): **1,925 (red), 3,198 (white) lbs/inch** applied by irrigation
Water use efficiency (WUE): **1,548 (red), 2,572 (white) lbs/inch** (irrigation + rainfall)

9. Site: #01E – 2005-06

Site Description:

Acres: 52.0
Soil characteristics: clay loam 0-18 in, loam 18-36 inches
Crop variety: Yellow Onion, variety: Cougar
Harvest season: Oct 05-Mar 06
Irrigation district: None-Class B water owner

Irrigation system:

Sub-surface drip, 18 emitter spacing at 0.4 gpm, single line
Field characteristics: Onions planted mid Oct ’05, harvested mid Mar ‘06
48 inch beds, 80 inch center-to-center
6 onion lines per bed
Fertilizer applied: unknown
Soil moisture monitoring: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6” off-center, 18”off-center, 6”center, and 30”center depths; ECRN-50 Rain gauge.

Irrigation schedule and amounts:

Total irrigation: **1.12 ac-ft/ac** or **13.41 ac-in/ac** in 13 irrigation events
Total rainfall: 3.3 inches
Total water input: 16.68 inches/ac

Irrigation method:

Drip tape buried center of bed, 6 to 8 inches deep, with 18 inch emitter spacing at 0.4 gpm. Irrigation scheduling was not based on soil moisture monitoring but by grower experience. Irrigated using a portable sand filter/ pump combination and metered each time.

Observations made during the crop season:

Soil moisture sensors were in place 3 to 4 weeks after planting and were removed prior to harvest. Datalogger and sensors were placed in near corner of the field where the portable pump was used on the farm to irrigate the field. The portable pump often leaked and flooded the moisture sensors so irrigations scheduling was not achieved using soil moisture sensors for this crop. Equipment malfunction of the data logger caused loss of data during the month of February.

Yield:

Total: 33,261 50-lbs bags or 640 bags/ac (32,000 lbs/ac) yellow onions

Water use summary:

Irrigation use efficiency (IUE): **2,386 lbs/ac-inch** applied by irrigation

Water use efficiency (WUE): **1,918 lbs/ac-inch** (irrigation + rainfall)

Economic Summary: Demonstration Site 1E

The Demonstration Site 1C analysis consists of a 10-year financial outlook (2006-2015) for the 52 acres of yellow onions production under 1-line drip irrigation. The onions were planted on 80-inch beds. The yellow onions cash receipts were calculated on a $1,150/acre basis and held constant during the 10-year projection. 2006 costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a 1-line drip irrigation system at a cost of $1,550 per acre, including projected drip tape replacement. The 1-line drip system expense is evenly distributed ($155/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $1,150/acre over the 10-year period and cash costs average $1,047/acre, including $90/acre variable irrigation costs. Net cash farm income (NCFI) averages $103/acre due largely to gross receipts per acre being held at a constant $1,150 per acre. The risk associated with prices and yields suggests a 29.1% chance of negative NCFI. In a normal production year, NCFI could range as much as -$385/acre to $519/acre.

10. Site: # 02A – 2006-07

Site Description:

Acres: 14.0
Soil characteristics: sandy clay loam 0-24 inches, sandy clay 24-36 inches
Crop variety: Henderson grapefruit
Harvest season: Apr 06-May ‘07
Irrigation district: United

Irrigation system:

Narrow bordered flood
Field characteristics: 15’ x 24’ spacing (115 trees/Acre)
Fertilizer applied: unknown
Sensor information: Soil moisture: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6, 12, 24 and 36 inch depths; ECRN-50 Rain gauge.
Water meter: installed at end of season, March 2007.

Irrigation schedule and amounts:

Total irrigation:
Total rainfall: 26.1 inches (estimated from McAllen weather station, rain gauge on-site bad)
Total water input:

Irrigation method:

Watered every 4 to 5 weeks during the summer months; approx. 240 gal/week per tree. Farmer preforms raised berms between rows to channel water at a faster rate to the end of the bed. Farmer uses 12” concrete outlet valve and we installed a 10-inch pipe with Siemens Transit-time meter in March 2007.

Observations made during the crop season:

Initial year of working with this grower; no accurate water metering occurred from this site during this harvest season, therefore water application is an approximation. Crop harvested later in season, May 2007.

Yield:

Previous harvest seasons: 355 tons (25.4 tons/ac) 2004-2005; 200 tons (14.3 tons/ac) 2005-2006
Total: ? tons or ? tons/Ac; ? % fresh pack and ? % juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May ’07 harvest data

11. Site: # 02B – 2006-07

Site Description:

Acres: 5.0
Soil characteristics: sandy clay loam 0-36 inches
Crop variety: Rio Red grapefruit
Harvest season: Apr 06-May '07
Irrigation district: United

Irrigation system:

Microjet spray
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: unknown
Soil moisture sensor monitoring: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6, 12, 24 and 36 inch depths; ECRN-50 Rain gauge.
Water meter: 2 inch turbine meter installed at end of season, March 2007.

Irrigation schedule and amounts:

Total irrigation: (approximation)
Total rainfall: 26.1 inches (estimated from McAllen weather station, rain gauge on-site bad)
Total water input: (approximation)

Irrigation method:

No current water usage numbers at this time. Watered 48 hours/week during summer months; approximately 240 gal/week per tree. Water meter installation delayed on property site, ready for 2007-2008 harvest season.

Observations made during the crop season:

Initial year of working with this grower starting with no accurate metering in 2006-07 growing season, so early irrigation data prior to this time during this harvest season is an approximation. Crop harvested later in season, May 2007. Rio Red grapefruit grown on Carrizo, Sour orange and Swingle root stocks used on this plot.

Yield:

Previous harvest seasons: 56 tons (11.2 tons/ac) 2004-2005; 86 tons (17.2 tons/ac) 2005-2006
Total: ? tons or ? tons/Ac; ? % fresh pack and ? % juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

12. Site: # 02C – 2006-07

Site Description:

Acres: 4.0
Soil characteristics: sandy clay loam 0-36 inches
Crop variety: Rio Red grapefruit
Harvest season: Apr 06-May '07
Irrigation district: United

Irrigation system:

Drip Irrigation
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: unknown
Soil moisture sensor monitoring: No data sensor equipment installed, waiting on new metering devices to arrive. WatchDog datalogger to be installed with WaterMark soil moisture sensors when water meter installed summer '07.

Irrigation schedule and amounts:

No current water usage numbers at this time.
Total irrigation: (approximation)
Total rainfall: 26.1 inches (estimated from McAllen weather station, rain gauge on-site bad)
Total water input: (approximation)

Irrigation method:

Single line Drip system
Site needs new drip equipment repair

Observations made during the crop season:

This site is newly established and not completely equipped. The site will be completely operational for the 2007 crop year. Recently installed 2 inch water meter in June '07 to determine water delivered to drip irrigated acreage.

Yield:

Previous harvest seasons: 56 tons (11.2 tons/ac) 2004-2005; 86 tons (17.2 tons/ac) 2005-2006
Total: ? tons or ? tons/Ac; ? % fresh pack and ? % juice marketable fruit
Water use summary:
Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

13. Site: # 03A – 2006-07

Site Description:

Acres: 41.3
Soil characteristics: sandy clay loam 0-36 inches
Crop variety: Rio Red grapefruit
Harvest season: Apr 06-May ‘07
Irrigation district: Harlingen 1

Irrigation system:

Conventional Flood
Field characteristics: 15’ x 24’ spacing (115 trees/Acre)
Fertilizer applied: unknown
Soil moisture sensor monitoring: Decagon data logger EM-50, ECHO-10 probes, Probes set at 6, 12, 24 and 36 inch depths; ECRN-50 Rain gauge.
Water meter: None. Water meter will need to be installed at a high rise water release flow valve to measure all water going to field site. Anticipated installation by Aug ’07.

Irrigation schedule and amounts:

No current water usage numbers at this time.
Total irrigation: (approximation)
Total rainfall: 24.9 inches (estimated from Harlingen weather station, rain gauge on-site bad)
Total water input: (approximation)

Irrigation method:

Conventional Flood
In process of obtaining current water usage numbers from irrigation district and grower.

Observations made during the crop season:

This site is set up with high mounted (30”) freeze protection watering system. This system could be set up as drip or micro jet irrigation in the future.

Yield:

Previous harvest seasons: 283 tons (6.9 tons/ac) 2005-2006
Total: ? tons or ? tons/Ac; ? % fresh pack and ? % juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May ’07 harvest data

14. Site: # 04A – 2006-07

Site Description:

Acres: 86
Soil characteristics: sandy clay loam 0-24 inches, clay 24-36 inches
Crop variety: Rio Red grapefruit
Harvest season: Apr 06-May '07
Irrigation district: Hidalgo 1

Irrigation system:

Drip Irrigation
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: unknown
Soil moisture sensor monitoring: Decagon data logger EM-50, ECHO-10 probes at 6, 12 and 24 inches under center of tree canopy and within 6 inches of drip line, ECRN-50 Rain gauge.
Water meter: grower has own meters

Irrigation schedule and amounts:

No current water usage numbers at this time.
Total irrigation: (approximation)
Total rainfall: 16.4 inches (estimated from Edinburg weather station, rainguage data unreliable)
Total water input: (approximation)

Irrigation method:

Single line Drip system
Emmitter spacing with flow rate

Observations made during the crop season:

Minimal sheep nose effect on grapefruit was noticed on 2006 crop.
Sandy clay loam found to a depth of 24"; at 36" levels found clay soils.
Installed Watermark sensors at 6, 12, 24 inches deep under canopy and 12 inch deep at tree drip line with Watch Dog data logger for grower to use visual readings to aid in soil moisture indication.

Yield:

Total: ? tons or ? tons/Ac; ? % fresh pack and ? % juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

15. Site: # 04B – 2006-07

Site Description:

Acres: 30
Soil characteristics: clay loam 0-6 inches, clay 6 -36 inches
Crop variety: Rio Red grapefruit
Harvest season: Apr 06-May '07
Irrigation district: Hidalgo 1

Irrigation system:

Microjet spray
Field characteristics: 15' x 24' spacing (115 trees/Acre)
Fertilizer applied: unknown
Soil moisture sensor monitoring: Decagon data logger EM-50, ECHO-10 probes at 6, 12 and 24 inches under center of tree canopy and within 6 inches of drip line, ECRN-50 Rain gauge.
Water meter: grower has own meters

Irrigation schedule and amounts:

No current water usage numbers at this time.
Total irrigation: (approximation)
Total rainfall: 16.4 inches (estimated from Edinburg weather station, rain gauge data unreliable)
Total water input: (approximation)

Irrigation method:

Microjet spray system. Single riser with 360 degree rotation spray emitter placed at the middle between trees to minimize spray on tree trunk.

Observations made during the crop season:

Minimal sheep nose effect on grapefruit was noticed on 2006-07 crop.
Clay loam found to a depth of 6"; clay soil found at lower levels
Grower requested installation of Watermark sensor 12 inch deep at tree drip line with grower to use visual readings to aid in soil moisture indication of wetting front.

Yield:

Total: ? tons or ? tons/Ac; ? % fresh pack and ? % juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch per tree** applied by irrigation
Water use efficiency (WUE): **? lbs/inch per tree** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

16. Site: # 05A – 2006-07

Site Description:

Acres: 22.0 (2.5 ac white; 19.5 ac yellow & red)
Soil characteristics: sandy clay loam 0-12 inches, clay loam 12-36 inches
Crop variety: White, Yellow, Red Onions
Harvest season: Oct 06-Mar 07
Irrigation district: Delta Lake

Irrigation system:

Sub-surface drip
Field characteristics: Onions planted mid Oct '06, harvested mid Mar '07
60 inch beds,
6 onion lines per bed, rows spaced 7 inches apart
Fertilizer applied: unknown
Soil moisture monitoring: Decagon data logger EM-50, ECHO-10 probes, Probes set at depths 6-, 12-, and 24-inch bed center, and 6- and 12-inches at edge of bed; WatchDog datalogger set up adjacent to field site with a Rain gauge.

Irrigation schedule and amounts:

Total irrigation: (data unavailable)
Total rainfall: 7.1 inches
Total water input: (data unavailable)

Irrigation method:

Drip tape buried center of bed, 4 to 6 inches deep, 7/8 inch tape at low flow rate of 0.24 gph. Irrigation scheduling was not based on soil moisture monitoring but by grower experience. Irrigated using a portable sand filter/ pump combination and metered each time.

Observations made during the crop season:

Information on these onions will be provided by grower when he has time to gather numbers together sent by packing house. Field slope ¼ inch.

Yield:

Total: ? 50-lbs bags or ? bags/ac white onions; ? 50-lbs bags or ? bags/ac yellow onions; ? 50-lbs bags or ? bags/ac red onions

Water use summary:

Irrigation use efficiency (IUE): **? lbs/inch** applied by irrigation
Water use efficiency (WUE): **? lbs/inch** (irrigation + rainfall)
Currently lacking all 06-07 irrigation and May '07 harvest data

17. Site: #06A - 2006-07

Site Description:

Acres: 1.1 (½ drip, ½ microjet)
Soil characteristics: silty clay loam 0-36 inches
Crop variety: Rio Red grapefruit
Harvest season: Jan 06-Mar ‘07
Irrigation district: Hidalgo Cameron 9

Irrigation system:

Microjet spray and drip irrigated
Field characteristics: 16’ x 25’ spacing (105 trees/Acre)
Fertilizer applied: 1 lb Nitrogen/tree/yr 21-0-0
Soil moisture sensor monitoring: Watch Dog data logger, Watermark soil moisture sensors, Sensors set at 6”, 12”, and 24” and 36” depths;
Rain gauge: WatchDog datalogger
Water meter: 1” turbine-type flow meter

Irrigation schedule and amounts:

Irrigation performed using WatchMark soil moisture sensor readings and try to match ETc
Total irrigation: Drip: **3.86 ac-ft/ac** or **27.2 ac-in/ac;** Spray: **4.91 ac-ft/ac** or **32.6 ac-in/ac**
Total rainfall: 19.4 inches
Total water input: Drip 46.61 inches/acre; Microjet spray 52.07 inches/ac

Irrigation method:

Single line Drip system

Observations made during the crop season:

Minimal sheep nose effect on grapefruit was noticed on 2006 crop.
Very clayey soil. Yields a little lower due to very heavy canopy pruning in Feb ’05.
Some border row trees suffered from high incidence of phytophora and dieback.

Yield:

Total: Drip 19.0 tons/Ac; 55% fresh pack and 45% juice marketable fruit
Total: Spray 20.0 tons/Ac; 54% fresh pack and 46% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **Drip 11.7 and Spray 10.2 lbs/inch per tree**
Water use efficiency (WUE): **6.8 (Drip) & 6.4 (Spray) lbs/inch per tree** (irrig.+ rain)

18. Site: #06B – 2006-07

Site Description:

Acres: 1.0 (flood)
Soil characteristics: silty clay loam 0-36 inches
Crop variety: Rio Red grapefruit
Harvest season: Jan 06-Mar ‘07
Irrigation district: Hidalgo Cameron 9

Irrigation system:

Flood, conventional
Field characteristics: 15’ x 24’ spacing (115 trees/Acre)
Fertilizer applied: 1 lb Nitrogen/tree/yr 21-0-0
Soil moisture sensor monitoring: Watch Dog data logger, Watermark soil moisture sensors, Sensors set at 6”, 12”, and 24” and 36” depths;
Rain gauge: WatchDog datalogger
Water meter: 10” turbine-type flow meter

Irrigation schedule and amounts:

Irrigation performed using grower experience and estimations from Etc, typically irrigated at every 4-5 week intervals depending upon rainfall amount
Total irrigation: **5.76 ac-ft/ac** or **66.0 ac-in/ac**
Total rainfall: 19.4 inches
Total water input: Flood 85.4 inches/ac

Irrigation method:

Traditional flood irrigation of field with 4 rows of citrus trees per field irrigated area

Observations made during the crop season:

High level of sheep nosing on grapefruit and large number of fruit in extra-large juice market class was noticed on 2006 crop.
Very clayey soil.
Pruning caused decline in yields during years 2005-2006.

Yield:

Total: Drip 19.0 tons/Ac; 55% fresh pack and 45% juice marketable fruit
Total: Spray 20.0 tons/Ac; 54% fresh pack and 46% juice marketable fruit

Water use summary:

Irrigation use efficiency (IUE): **Flood 6.0 lbs/inch per tree**
Water use efficiency (WUE): **Flood 4.6 lbs/inch per tree** (irrigation+ rain)

19. Site #21A - 2006

Site Description:

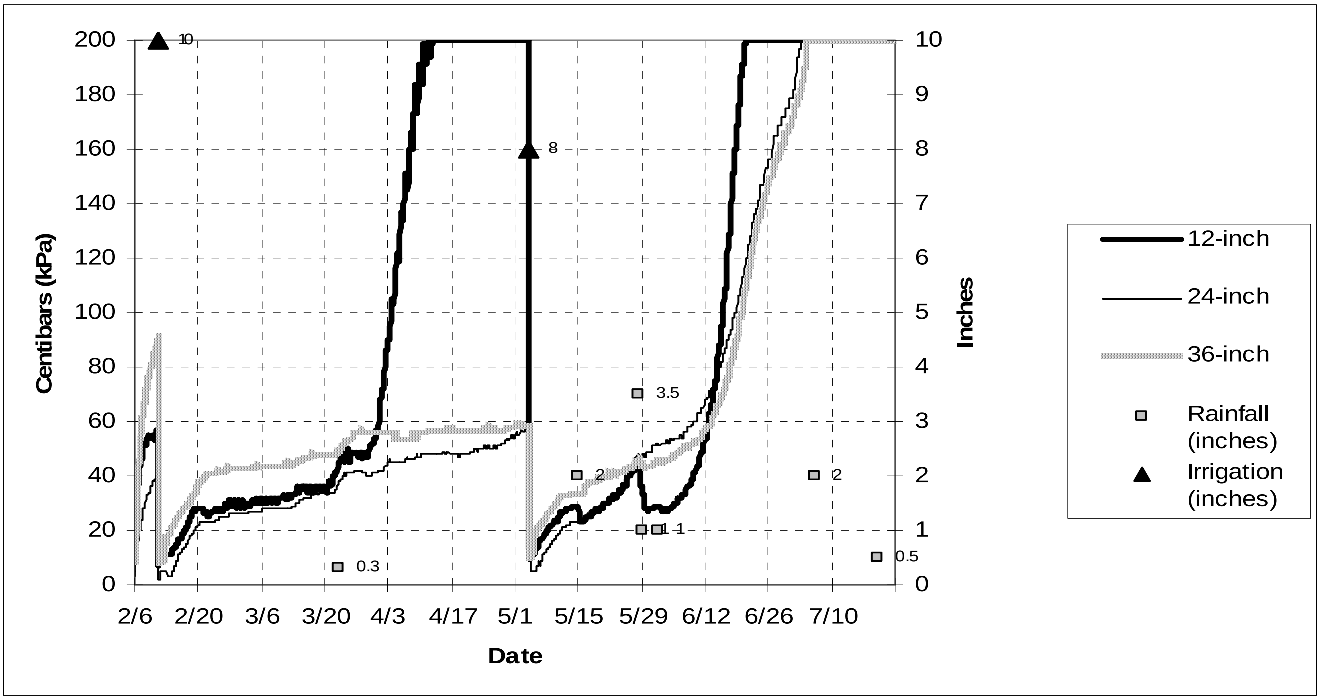
Acres: 3.5
Soil type: Sandy Loam (from 12 to 36-inch depth)
Crop Variety: Cotton FM 832 (P 02/02/06; H 08/04/06)
Irrigation system: furrow (by poly-pipe)
Field characteristics: 40-inch beds; 900 foot-long rows; population of 52,000 plants/acre
Fertilizer applied: total NPK 68-43-1 (side dressing)
type 20-10-0-4 (30gal/ac) & 4-29-2 (3 gal/ac)

Sensor and flow meter information:

Watermark and Echo-20 probes (12, 24 & 36-inch depth) connected to data loggers
Portable flow meter

Irrigation schedule and amounts:

Total irrigation of 18 inches/acre in 2 events (including 10 inches at pre-plant)
Total rainfall of 11.8 inches/acre
Total water input of 29.8 inches/acre



Irrigation method:

Heavy irrigation at planting to hydrate de dry profile; irrigation scheduling was not based on soil moisture; water was running until it reached the end of the furrows; water was provided by the district (pipeline)

Observations made during the crop season:

Cracking soil was giving inaccurate soil moisture readings at some point

Yield:

571 lbs/acre (1.2 bale/acre based on 471 lbs/bale)

Water use summary:

IUE: 31.7 lbs/inch of water applied by irrigation
WUE: 19.2 lbs/inch of water received (irrigation + rainfall)

20. Site #21B -2006

Site Description:

Acres: 100.0
Soil type: Sandy Loam (from 12 to 36-inch depth)
Crop Variety: Cotton FM 832 (P 02/02/06; H 08/04/06)

Irrigation system:

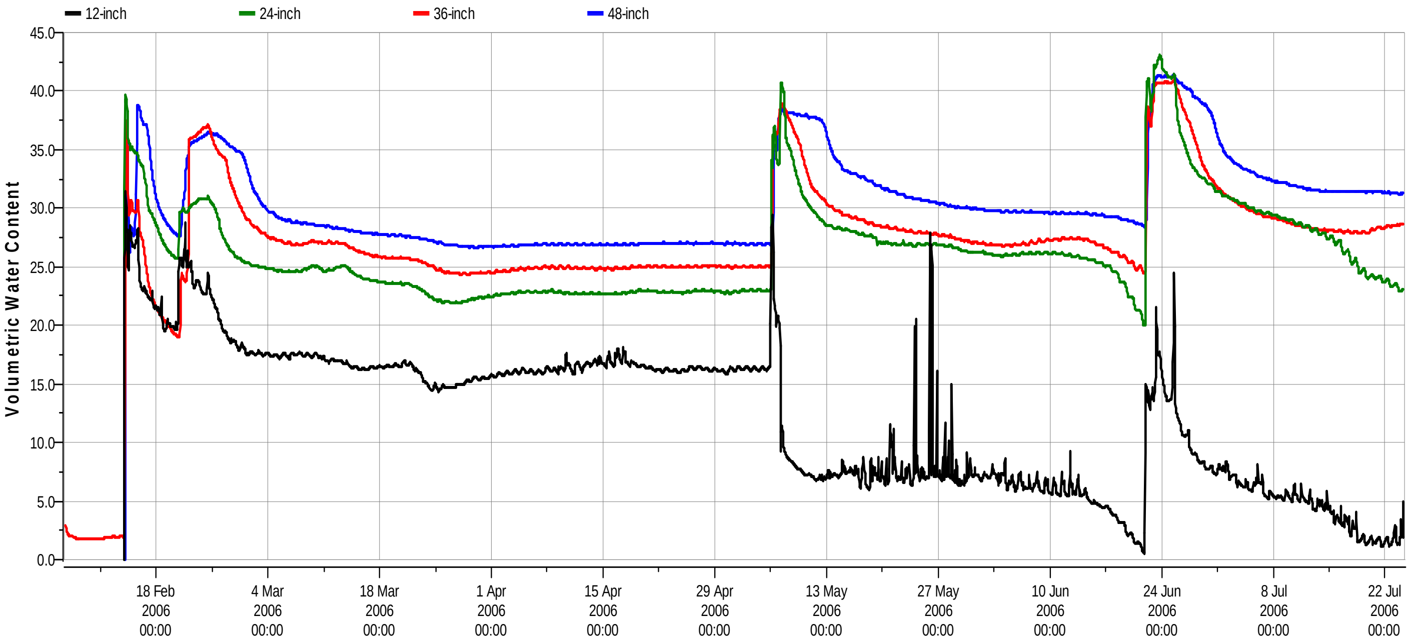
Furrow (by poly-pipe)
Field characteristics: 40-inch beds; 2,360 foot-long rows; population 52,000 plants/acre
Fertilizer applied: total NPK 68-43-1 (side dressing) type 20-10-0-4 (30gal/ac) & 4-29-2 (3 gal/ac)

Sensor and flow meter information:

Echo-10 probes (12, 24 & 36-inch depth) connected to data logger
Portable flow meter

Irrigation schedule and amounts:

Total irrigation of 22 inches/acre in 3 events (including 10 inches at pre-plant)
Total rainfall of 11.8 inches/acre
Total water input of 33.8 inches/acre



Irrigation method:

Heavy irrigation at planting to hydrate the dry profile; irrigation scheduling was not based on soil moisture; water was running until it reached the end of the furrows; water was provided by the district (pipeline)

Observations made during the crop season:

Due to the long length of rows, it appeared that maturity varied significantly from the beginning (most water received) to the end of the rows (least water received)

Yield:

820 lbs/acre (1.8 bale/acre based on 451 lbs/bale)

Water use summary:

IUE: 37.3 lbs/inch of water applied by irrigation
WUE: 24.3 lbs/inch of water received (irrigation + rainfall)
Site Information Form

21. Site #:22 - 2006

Site Description:

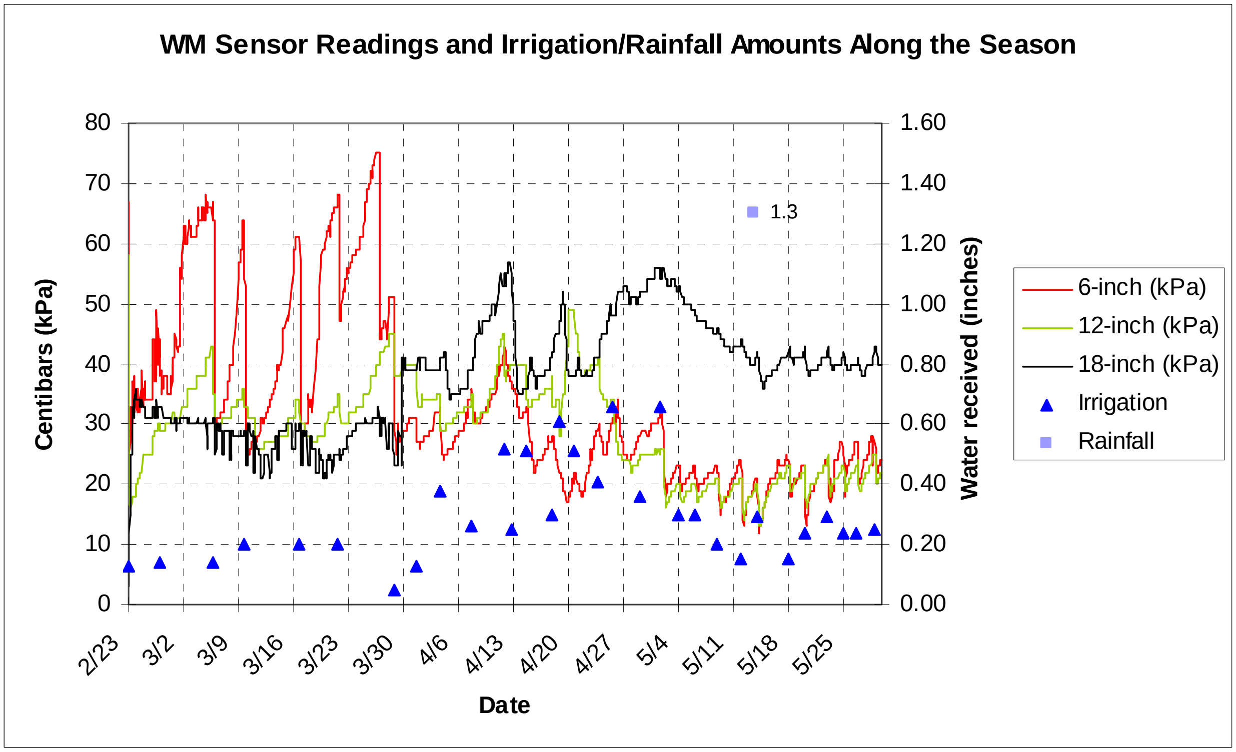
Acres: 3.0
Soil type: Loam (from 6 to 12-inch depth) and Silt Loam (18-inch depth)
Crop Variety: Honeydew Musk melon honey brews (P 02/13/06 and H 05/10 to 05/30/06)
Irrigation system: SDI
Field characteristics: 80-inch beds under black plastic mulch
Fertilizer applied: total NPK 153-98-21 (fertigation)
type 4-29-2 (20gal/ac), N32 (20 gal/ac), 9-0-0-11 (40 gal/ac) and 12-12-6 (25 gal/ac)

Sensor and flow meter information:

Watermark (6, 12 & 18-inch depth) and irrigation sensors connected to data logger
Water meter installed on one drip line

Irrigation schedule and amounts:

Total irrigation of 10 inches/acre
Total rainfall of 1.3 inch/acre
Total water input of 11.3 inches/acre



Irrigation method:

Irrigation scheduling was not based on soil moisture; each irrigation event was watering the 9-acre block (tomato, pepper, honeydew); water was pumped directly from the river (sand media filtration system)

Observations made during the crop season:

Logger wasn’t working properly during the first month: moisture readings had to be estimated

Yield:

39,000 lbs/acre

Water use summary:

IUE: 3,939 lbs/inch of water applied by irrigation
WUE: 3,482 lbs/inch of water received (irrigation + rainfall)

22. Site #23 – 2005-06

Site Description:

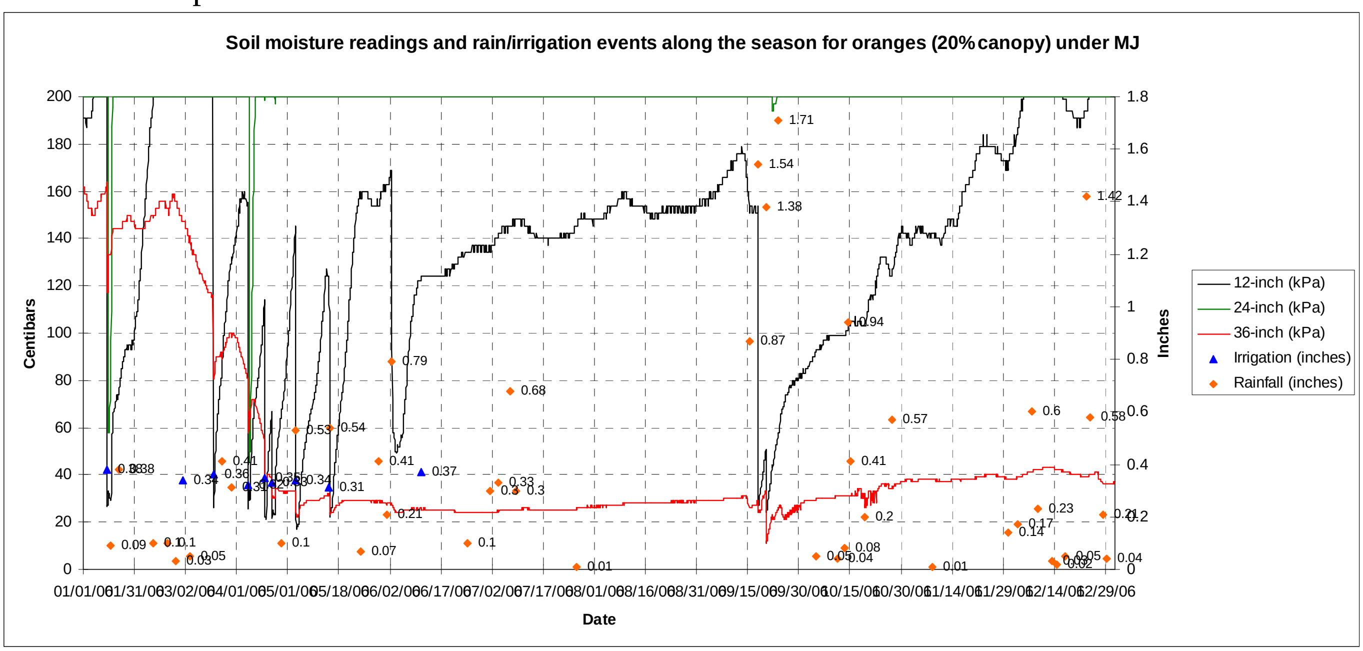
Acres: 10.0
Soil type: Sandy Clay Loam (12 and 36-inch depth) and Sandy Clay (24-inch depth)
Crop Variety: Valencia Oranges (Planted 1999)
Irrigation system: Micro-Jets (1 sprinkler/tree)
Field characteristics: population of 115 trees/acre, bare ground
Fertilizer applied: not known

Sensor and flow meter information:

Watermark (12, 24 & 36-inch depth) and irrigation sensors connected to data logger
Water meter installed on one drip line

Irrigation schedule and amounts:

Total irrigation of 3.4 inches/acre
Total rainfall of 17.8 inch/acre
Total water input of 21.2 inches/acre



Observations made during the crop season:

No irrigation since June 2006; sensors replaced at 6, 12 and 24-inch depth in December 2006

Yield:

15,812 lbs/acre (for season 2005-2006)

Water use summary:

IUE: 4,651 lbs/inch of water applied by irrigation
WUE: 746 lbs/inch of water received (irrigation + rainfall)

23. Site #:24 – 2005-06

Site Description:

Acres: 7.0
Soil type: Sandy Clay Loam (up to 24-inch depth) and Clay Loam (below 30-inch depth)
Crop Variety: Rio Red Grapefruits (Planted 1993)

Irrigation system:

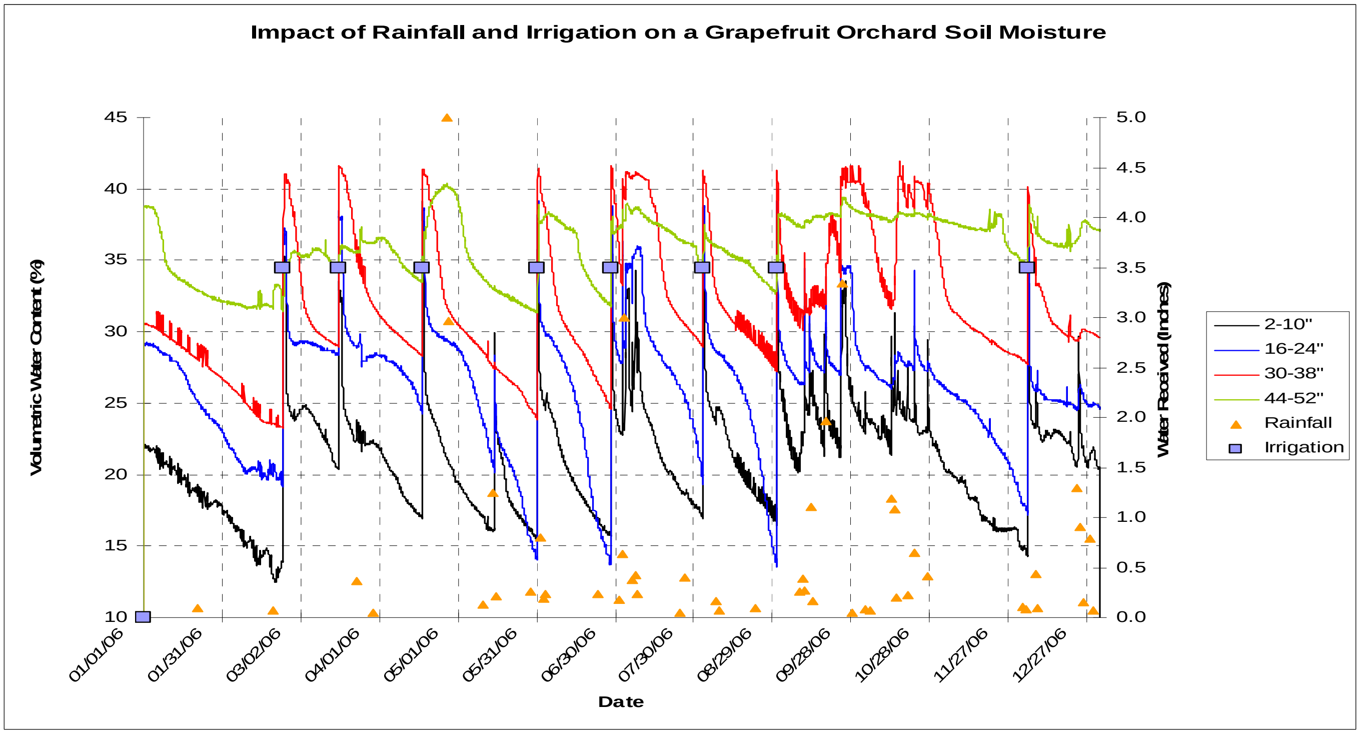
Flood
Field characteristics: population of 140 trees/acre, laser leveled bare ground
Fertilizer applied: 500 lbs/ac of ammonium sulfate at early bloom, and more (unknown)

Sensor and flow meter information:

Echo-20 probes (2-10, 16-24, 30-38 & 44-52-inch depth)
Portable flow meter

Irrigation schedule and amounts:

Total irrigation of 31.5 inches/acre
Total rainfall of 30.8 inch/acre
Total water input of 62.3 inches/acre



Irrigation method:

There is a border every other row and each pan is irrigated by one alfa-alfa valve (connected to canal: water provided by the district) until water fills in at the opposite side. Since the grower has a capacity of two heads, he opens four valves at a time (four pans). The design of his system allows him to apply about 3.5 inch for each irrigation. Water advances on the laser leveled ground 100 feet within 20 minutes. Irrigation scheduling was not based on soil moisture.

Yield:

72,600 lbs/acre (for season 2005-2006)

Water use summary:

IUE: 2,305 lbs/inch of water applied by irrigation
WUE: 1,165 lbs/inch of water received (irrigation + rainfall)

24. Site #:25 – 2005-06

Site Description:

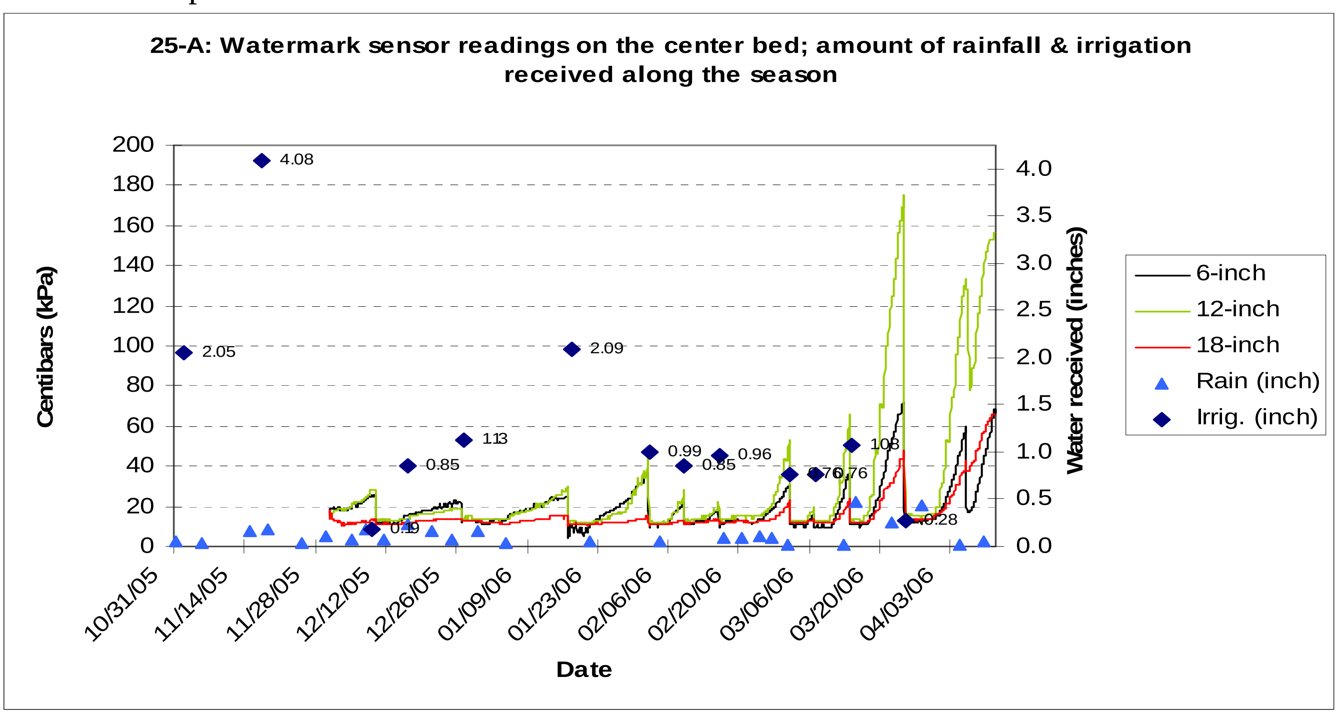
Acres: 56.0
Soil type: Silt Clay (from 6 to 18-inch depth)
Crop Variety: Sweet Sunrise Onion (P 10/11/05 and 04/15/06)

Irrigation system:

SDI (ref. 508-12-450)
Field characteristics: 80-inch beds (4 lines/bed); population of 48,135 plants/acre
Fertilizer applied: total NPK 36-98-6 (fertigation) type 4-29-2 (30gal/ac) and N32 (20 gal/ac)

Sensor and flow meter information:

Watermark (6, 12 & 18-inch depth) and irrigation sensors connected to data loggers
Water meter installed on one drip line
Irrigation schedule and amounts:
Total irrigation of 23.8 inches/acre
Total rainfall of 6.1 inches/acre (including 2.8 inches that occurred before planting)
Total water input of 29.9 inches/acre



Irrigation method:

Irrigation scheduling was not based on soil moisture; water was pumped directly from the river (sand media filtration system)

Observations made during the crop season:

Logger wasn’t working properly during the first month: moisture readings had to be estimated

Yield:

37,100 lbs/acre

Water use summary:

IUE: 1,563 lbs/inch of water applied by irrigation
WUE: 1,372 lbs/inch of water received (irrigation + rainfall)

25. Site #:26 – 2005-06

Site Description:

Acres: 15.7
Soil type: Sandy Loam (from 6 to 12-inch depth) and Sandy Clay Loam (18-inch depth)
Crop Variety: Cougar Onion (P 10/13/05 and 03/21/06)

Irrigation system:

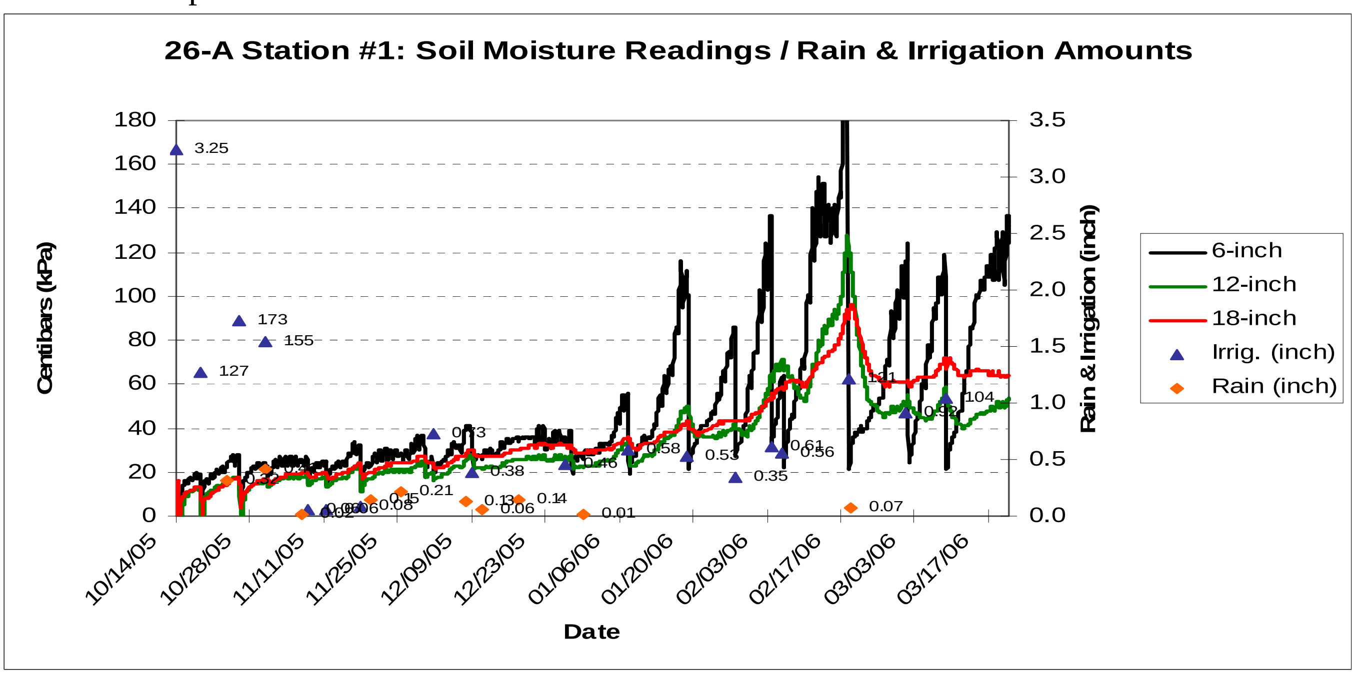
SDI (ref. 508-08-340)
Field characteristics: 40-inch beds (4 lines/bed); population of 81,900 plants/acre
Fertilizer applied: total NPK 175-217-182 (broadcast and fertigation)
type 7-34-7 (273 lbs/ac), 0-0-62 (191 lbs/ac), 9-0-0 (16 gal/ac), 5-26-3 (36 gal/ac), N32 (28 gal/ac) and 8-8-8 (20 gal/ac)

Sensor and flow meter information:

Watermark (6, 12 & 18-inch depth) and irrigation sensors connected to data loggers
Water meter installed on one drip line

Irrigation schedule and amounts:

Total irrigation of 15.3 inches/acre
Total rainfall of 1.5 inch/acre
Total water input of 16.8 inches/acre



Irrigation method:

Irrigation scheduling was not based on soil moisture; water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Yield:

48,336 lbs/acre

Water use summary:

IUE: 2,643 lbs/inch of water applied by irrigation
WUE: 1,902 lbs/inch of water received (irrigation + rainfall)

26. Site #:27 – 2005-06

Site Description:

Acres: 0.65
Soil type: Sandy Clay Loam (8-inch depth)
Crop Variety: Cougar Onion (P 11/11/05 and 04/19/06)

Irrigation system:

SDI (ref. Typhoon 875-10mil-F; 12-inch dripper spacing)
Field characteristics: 40-inch beds (2 lines/bed); population of 81,000 plants/acre; experimental block design (6 treatments replicated 3 times)
Fertilizer applied: total NPK 90-0-0 (fertigation)
type N32 (63 gal/ac. in three applications: Dec., Jan. & Mar.))

Sensor and flow meter information:

Watermark and Echo-10 sensors (8-inch depth) connected to data loggers or manual meters (daily readings)
Water meter installed on each treatment and replicate

Irrigation schedule and amounts:

Total irrigation of 9.1 in/ac. (20cb), 8.0 in/ac. (30cb), 3.6 in/ac. (50cb), 13.2 in/ac. (100% ET), 9.8 in/ac. (75% ET) and 6.6 in/ac. (50% ET)
Total rainfall of 2.0 inches/acre
Total water input variable according the treatments (add 2 inches for each irrigation amount)

Irrigation method:

Irrigation scheduling was based on Watermark sensor readings (triggered at 20, 30 and 50cb) and evapotranspiration (triggered at 50, 75 and 100% ET)

Yield:

16,400 lb/ac. (20cb); 16,800 lb/ac. (30cb); 10,300 lb/ac. (50cb); 16,100 lb/ac. (100% ET), 12,700 lb/ac. (75% ET) and 13,000 lb/ac. (50% ET)

Water use summary:

IUE (lbs/inch of water applied by irrigation): 1,810 (20cb); 2,120 (30cb); 2,870 (50cb); 1,230 (100% ET); 1,300 (75% ET) and 1,960 (50%)
WUE (lbs/inch of water received (irrigation + rainfall)): 1,480 (20cb); 1,680 (30cb); 1,830 (50cb); 1,060 (100% ET); 1,070 (75% ET) and 1,500 (50% ET)

27. Site #28A – 2005-06

Site Description:

Acres: 8.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Valencia Oranges (Planted 2003)

Irrigation system:

Micro-Jets (1 sprinkler/tree)
Field characteristics: population of 115 trees/acre; bare ground
Fertilizer applied: unknown

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 9.6 inches/acre
Total rainfall of 31.4 inch/acre
Total water input of 41.0 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.5 inch/acre was applied each time (total of 19 applications); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Sensors replaced at 6, 12 and 24-inch depth in December 2006

Yield:

First harvest of 1,100 lbs/acre (for season 2005-2006)

Water use summary:

IUE: 115 lbs/inch of water applied by irrigation
WUE: 27 lbs/inch of water received (irrigation + rainfall)

Economic Summary: Demonstration Site 28A

The Demonstration Site 28A analysis consists of a 10-year financial outlook (2006-2015) for the 8 acres of Valencia oranges under microjet spray irrigation. The orchard trees were assumed to be 3 years old. The Valencia orange price is held constant at $140/ton. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $1,935/acre over the 10-year period and cash costs average $1,125/acre, including $55/acre irrigation costs in 2006. Net cash farm income (NCFI) is negative in 2006-2008 reflecting lower levels of production from immature trees. It then increases from $360/acre in 2009 to about $2,000/acre in 2015. The risk associated with prices and yields suggests a minimal chance of negative NCFI after 2011 when the trees reach maturity. In a normal production year and mature trees (2011-2015), NCFI could range as much as $438/acre to $4,250/acre. Due to negative NCFI, the probability of carryover debt is 99% or greater during 2007-2008 and then declines to 1% or less in 2013 as the trees reach maturity and annual production increases.

28. Site #:28B -2005-06

Site Description:

Acres: 8.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Rio Red Grapefruits (Planted 1992)

Irrigation system:

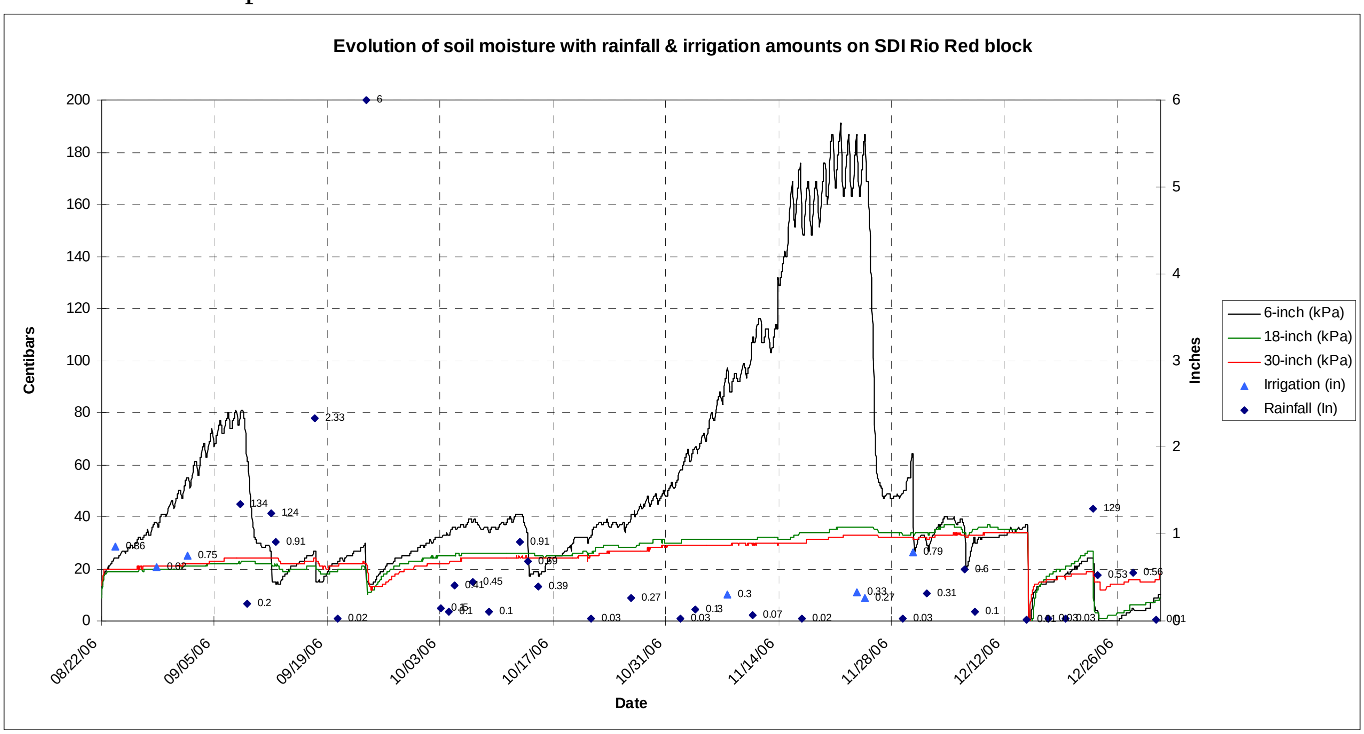
Flood converted to drip in August 2006 (surface double line 30-inch emitter)
Field characteristics: population of 116 trees/acre; bare ground
Fertilizer applied: total NPK (fertigation) type 7-21-7 (80 gal), 28-0-0 (80 gal) and 0-0-16 (150 gal)

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 4.3 inches/acre (drip since August 2006)
Total rainfall of 31.4 inch/acre (year 2006)
Total water input of 35.7 inches/acre



Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.6 inch/acre was applied each time (total of 7 applications since August 2006); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Monitoring started in August 2006 and sensors were replaced at 6, 12 and 24-inch depth in December 2006

Yield:

43,500 lbs/acre (for season 2005-2006)

Water use summary:

IUE (lbs/inch of water applied by irrigation): N/A since change of irrigation method during the season 2006
WUE (lbs/inch of water received (irrigation + rainfall)): N/A since change of irrigation method during the season 2006

29. Site #:28C – 2005-06

Site Description:

Acres: 8.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Rio Red Grapefruits (Planted 1992)

Irrigation system:

Micro-Jets (1 sprinkler/tree)
Field characteristics: population of 116 trees/acre; bare ground
Fertilizer applied: total NPK (fertigation) type 7-21-7 (80 gal), 28-0-0 (80 gal) and 0-0-16 (150 gal)

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 31.3 inches/acre (including 6 inches by flood)
Total rainfall of 31.4 inch/acre
Total water input of 62.7 inches/acre

Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.8 inch/acre was applied each time by Micro-Jet (total of 33 applications); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Sensors were replaced at 6, 12 and 24-inch depth in December 2006

Yield:

61,000 lbs/acre (for season 2005-2006)

Economic summary:

IUE: 1,949 lbs/inch of water applied by irrigation
WUE: 973 lbs/inch of water received (irrigation + rainfall)

Economic Summary: Demonstration Site 28C

The Demonstration Site 28C analysis consists of a 10-year financial outlook (2006-2015) for the 8 acres of Rio Red grapefruit under microjet spray irrigation. The orchard was assumed to have mature trees. The Rio Red grapefruit price is held constant at $150/ton. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a microjet spray system at a cost of $1,000 per acre. The microjet spray system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $3,296/acre over the 10-year period and cash costs average $1,173/acre, including $110/acre variable irrigation costs. Net cash farm income (NCFI) averages $2,123/acre due largely to the price being held at a constant $150/ton. The risks associated with prices and yields suggest a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $750/acre to $4,375/acre.

30. Site #:28D – 2005-06; 2006-07

Site Description:

Acres: 7.0
Soil type: Sandy Loam (up to 30-inch depth)
Crop Variety: Marrs and Navel (Planted 1991)

Irrigation system:

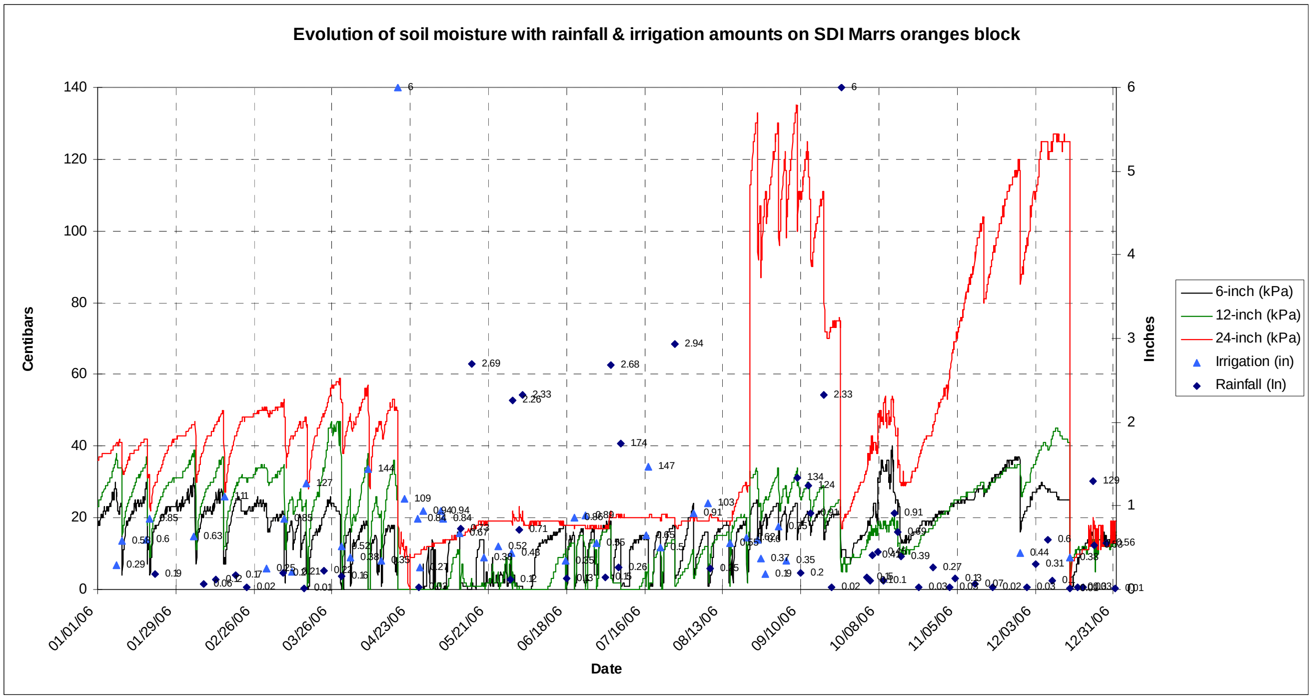
Drip (surface double line 30-inch emitter)
Field characteristics: population of 115 trees/acre; bare ground
Fertilizer applied: total NPK (fertigation)
type 7-21-0 (70 gal), 28-0-0 (80 gal), 9-0-0 (110 gal) and 0-0-16 (90 gal)

Sensor and flow meter information:

Watermark (6, 18 & 30-inch depth) and irrigation sensors connected to data logger
Water meter installed at the pump house

Irrigation schedule and amounts:

Total irrigation of 33.7 inches/acre (including 6 inches by flood)
Total rainfall of 31.4 inch/acre
Total water input of 65.1 inches/acre



Irrigation method:

Irrigation scheduling was based on soil moisture and an average of 0.7 inch/acre was applied each time (total of 42 applications by drip); water was provided by the district (pipeline) into a reservoir (sand media filtration and pump system)

Observations made during the crop season:

Sensors were replaced at 6, 12 and 24-inch depth in December 2006

Yield:

32,000 lbs/acre (for season 2005-2006) / 26,000 lbs/acre (season 2006-2007)

Water use summary:

IUE: 772 lbs/inch of water applied by irrigation
WUE: 399 lbs/inch of water received (irrigation + rainfall)

Economic Summary: Demonstration Site 28D

The Demonstration Site 28D analysis consists of a 10-year financial outlook (2006-2015) for the 7 acres of early oranges (3.5 acres of Marrs & 3.5 acres Navel) under 2-line drip irrigation. The orchard was assumed to have mature trees. The early orange price is held constant at $115/ton. 2006 production costs and overhead charges are producer estimates.

The analysis also includes the purchase and use of a 2-line drip system at a cost of $1,000 per acre. The 2-line drip system expense is evenly distributed ($100/acre/year) over the 10-year period with the assumption of no financing costs.

Total cash receipts average $1,836/acre over the 10-year period and cash costs average $923/acre, including $110/acre variable irrigation costs. Net cash farm income (NCFI) averages $913/acre due largely to the price being held at a constant $115/ton. The risks associated with prices and yields suggest a small chance of negative NCFI. In a normal production year, NCFI could range as much as -$143/acre to $2,571/acre.

31. Site #:29 - 2006

Site Description:

Acres: 2.6
Soil type: Sandy Clay Loam (from 12 to 36-inch depth)
Crop Variety: Cotton DP 444 (P 02/28/06; H 08/04/06)

Irrigation system:

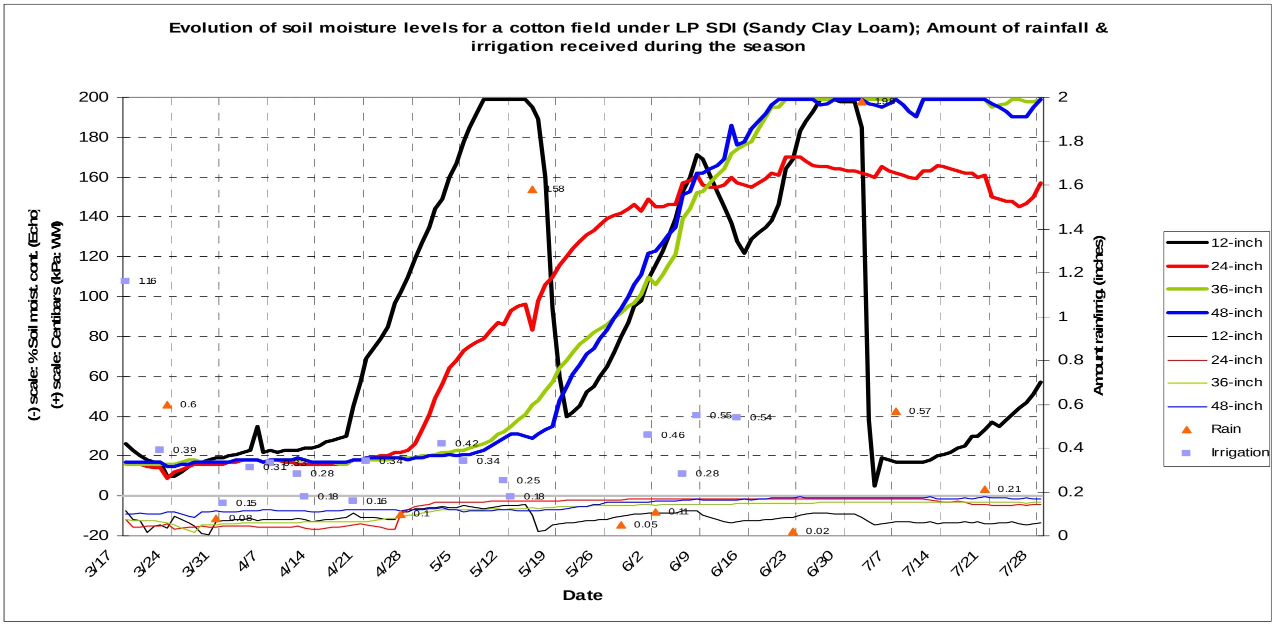
Low Pressurized SDI (2-3 PSI) by poly-pipe
Field characteristics: 40-inch beds; 50 to 450 foot-long rows; population of 52,000 plants/acre Fertilizer applied: total NPK 100-0-0 (fertigation) type N32 (70gal/ac in two applications)

Sensor and flow meter information:

Watermark and Echo-10 probes (12, 24 & 36-inch depth) connected to manual meters (daily readings)
Installed 2-inch water meter

Irrigation schedule and amounts:

Total irrigation of 6.3 inches/acre in 31 applications
Total rainfall of 5.3 inches/acre
Total water input of 11.6 inches/acre



Irrigation method:

Irrigation scheduling was based on soil moisture but it was not possible to provide enough water to fulfill the crop water requirements; water was provided by the district (canal) and filtered with a 2-inch disk filter (mesh 125)

Observations made during the crop season:

Soil moisture readings were always very low after full bloom stage. Irrigation uniformity was excellent (>96%) throughout the whole system at 3 PSI

Yield:

1,276 lbs/acre (2.6 bales/acre based on 491 lbs/bale)

Water use summary:

IUE: 202.5 lbs/inch of water applied by irrigation
WUE: 110 lbs/inch of water received (irrigation + rainfall)

32. Site # 41, Field 41A and 41B Spring 2006

Site Description:

The 38 acre field was planted in cotton and although divided into two sections, the entire field was surge irrigated. The soil type is Harlingen Clay (HA). The field has a slope of .0005' to the West and the same slope to the North.

Sensor Installation:

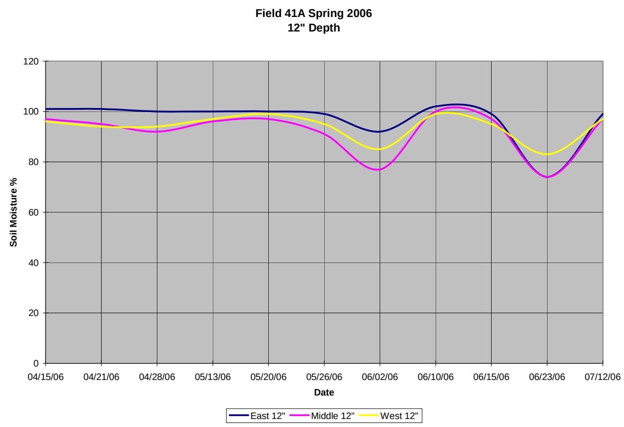
One row located 50 rows from the North side were selected. Three sensor sites were installed along this row. The East site was 100' inside the field, the Middle site was 640' inside the field and the West site was 100' inside the field. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 12", 18", 24" and 30". A McCrometer flow meter was used to measure the amount of water applied.

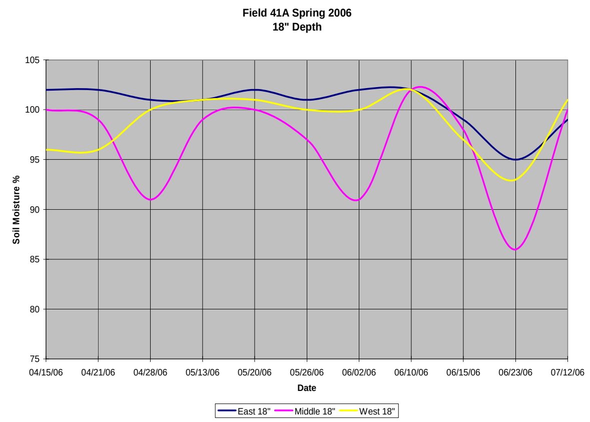
Irrigation Schedule:

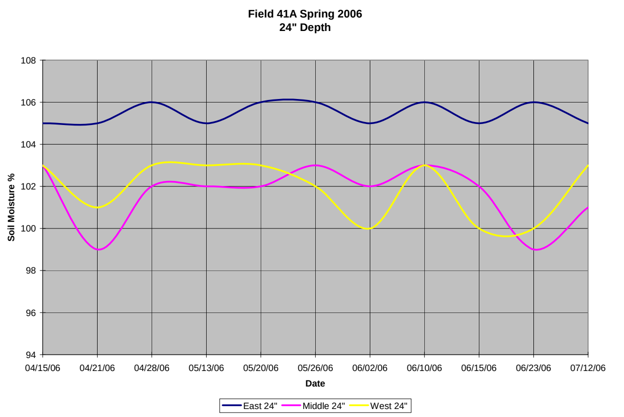
Date		Water Applied per Acre
3/12		5.47"
5/7		6.23"
6/5		6.41"
6/23		7.04"
	Total	25.15"

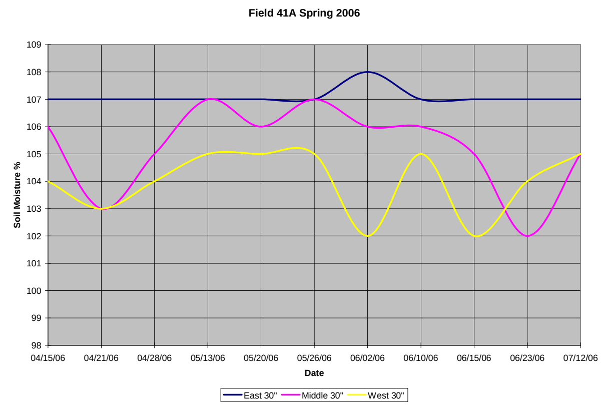
Irrigation Method:

The surge controller was programmed to complete the irrigation cycle in 24 hours with the first alternation to occur at the 5 hour interval. The cooperator used 18" diameter polypipe. The surge controller was programmed to alternate 3 cycles in a 24-hour period. The row length is 1280'.









Observations:

The surge technology allows the grower to select alternation intervals at will, the shorter the interval, the greater the water savings. The difficulty is keeping the polypipe from tearing during the multiple inflate/deflate cycles. Selecting only three alternations in a 24-hour set insured a timely irrigation event while keeping application rates at 7" per acre or less.

The 24" and 30" depth charts show little change in the soil moisture throughout the active growing season. Part of the reason is the 64" wide row pattern with the cotton plants on 32" centers. The Aqua-Pro tubes were installed in the center of the raised bed, 16" away from the cotton plants. The 6" depth charts show substantial fluctuations in soil moisture mostly due to the soil cracking and breaking contact with the buried sensor tube. The 12" depth curve is the one to watch for irrigation scheduling with cotton. The Aqua-Pro system works well in providing soil moisture vs. date trends at various depths which the grower can use to schedule irrigations. One problem noted with the Aqua-Pro sensor is that when the soil is at saturation the reported soil moisture is many times in excess of 100%. This problem seems to be more prevalent in heavy clay soils.

Economic Summary: Demonstration Site 41

The Demonstration Site 41 analysis consists of a 10-year financial outlook (2006-2015) for the 38.5 acres of cotton production under surge irrigation. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.59/lb., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a surge valve at a cost of $1,800. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

Total cash receipts average $878/acre over the 10-year period and cash costs average $571/acre, including $53/acre irrigation costs. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Net cash farm income (NCFI) increases throughout the 10-year period from $228/acre in 2006 to $364/acre in 2015. The risk associated with prices and yields suggests a minimal chance of negative NCFI. In a normal production year, NCFI could range as much as $208/acre plus or minus the average expected NCFI for the site.

33. Site # 42, Field 42A Spring 2006

Site Description:

The 66 acre field was planted in grain sorghum. Surge irrigation technology was used with 21" polypipe. The soil type at the NW and NE sensor site is Harlingen clay (HA), at the SW sensor site the soil type is Laredo Silty Clay Loam (LAA), and the SE sensor site soil type is Laredo-Reynosa complex (LEA).

Sensor Installation:

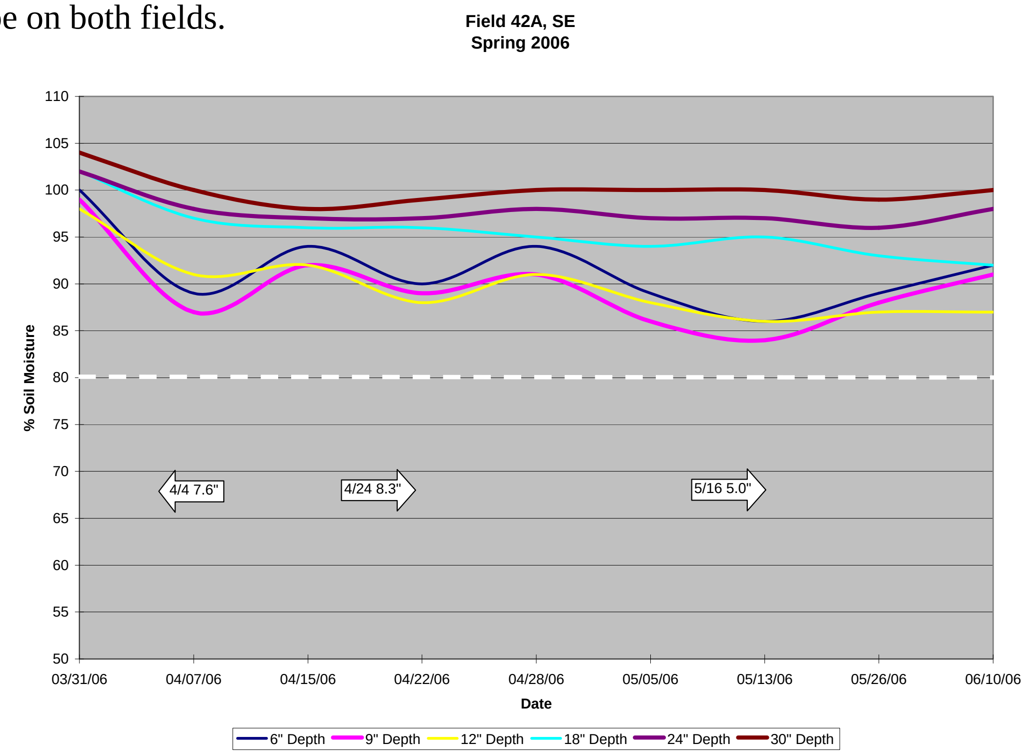
Due to the variations in soil type, sensor sites were installed in the four corners of the field. The NE site was located 150 rows from the West corner and 500' inside the field. The NW site was 50 rows from the West corner and 150' inside the field. The SW site was located 250 rows from the East corner and 500' inside the field. The SE site was 50 rows from the East corner and 150' inside the field. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 9", 12", 18", 24" and 30". A McCrometer flowmeter was used to measure the amount of water applied.

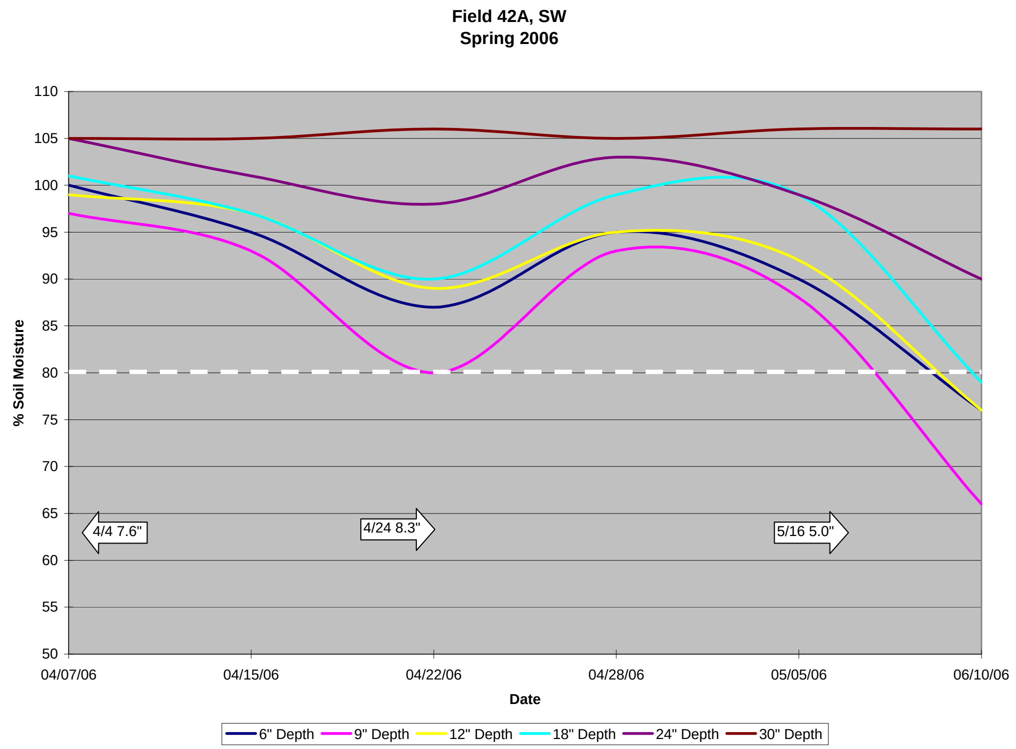
Irrigation Schedule:

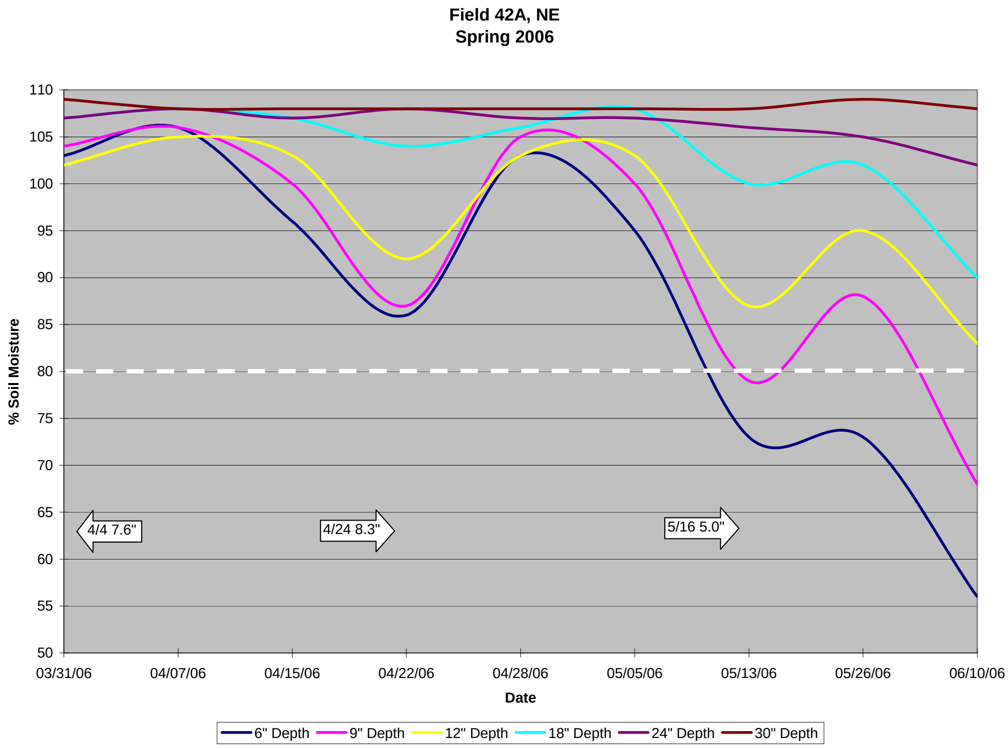
Date	Irrigation Method		Amount of Water Applied, per Acre
4/4	flooded furrow		7.6"
4/24	surge		8.3"
5/16	surge		5.0
		Total	20.9"

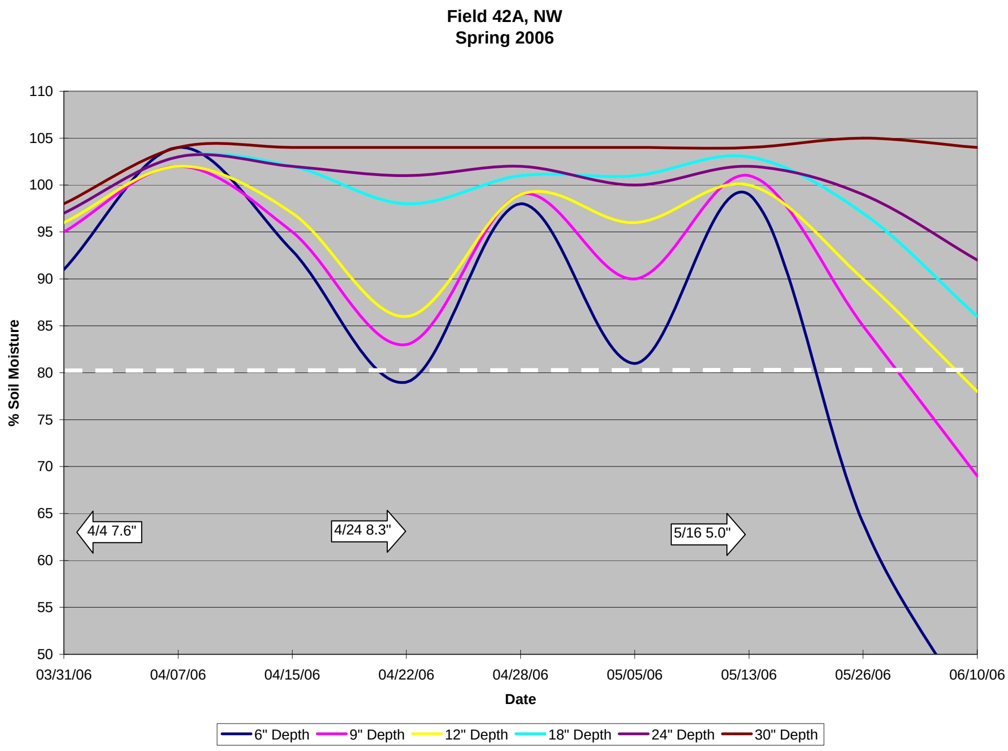
Irrigation Method:

The surge controller was programmed to complete the irrigation cycle in 24 hours with the first alternation to occur at the 5 hour interval. The cooperator used 21" diameter polypipe on both fields.






Field 42A, NE
Spring 2006
% Soil Moisture
110
105
100
95
90
85
80
75
70
65
60
55
50
4/4 7.6"
4/24 8.3"
5/16 5.0"
03/31/06
04/07/06
04/15/06
04/22/06
04/28/06
05/05/06
05/13/06
05/26/06
06/10/06
Date
6" Depth
9" Depth
12" Depth
18" Depth
24" Depth
30" Depth


Field 42A, NW
Spring 2006
% Soil Moisture
110
105
100
95
90
85
80
75
70
65
60
55
50
4/4 7.6"
4/24 8.3"
5/16 5.0"
03/31/06
04/07/06
04/15/06
04/22/06
04/28/06
05/05/06
05/13/06
05/26/06
06/10/06
Date
6" Depth
9" Depth
12" Depth
18" Depth
24" Depth
30" Depth

Observations:

The surge technology did not conserve water in the 4/24 irrigation because the polypipe burst and we were unable to separate the amount of water lost from the amount of water applied. The subsequent irrigation on 5/16 did provide considerable savings compared to the initial irrigation on 4/4. In addition to the obvious use of less water, the differences between a 5.0”/ac and 7.6”/ac irrigation can be substantial when you consider the risks of untimely rains and the undesirable effects of saturating the root zone of shallow rooted crops such as grain sorghum.

The surge valve offers many options when selecting the alternation intervals, but a problem arises when a section of the polypipe has been damaged. When the damaged section of polypipe is replaced with a sleeve of polypipe, it is very difficult to prevent the sleeve from slipping during repeated fill/drain cycles. The solution is to use a section of corrugated pipe as a splice and to tie the polypipe to this corrugated pipe.

Small elevation changes, restrictions in elbows, flowmeters, and the surge valve itself all contribute to significant reductions in the irrigation flow rate. These factors reduce the number of acres per hour that can be irrigated by as much as 50%, while still providing water conservation.

High moisture rates were maintained throughout the growing season within the 9” and 12” depths at all 4 sites never dipping below the 80% soil moisture level. Soil moisture levels at the 30” depth were very stable throughout the season.

One problem noted with the Aqua-Pro sensor is that when the soil is at saturation the reported soil moisture is many times in excess of 100%. This problem seems to be more prevalent in heavy clay soils.

34. Site # 42, Field 42B Spring 2006

Site Description:

The 95 acre field was planted in cotton. Surge irrigation technology was used with 21" polypipe. The soil type is Harlingen clay (HA).

Sensor Installation:

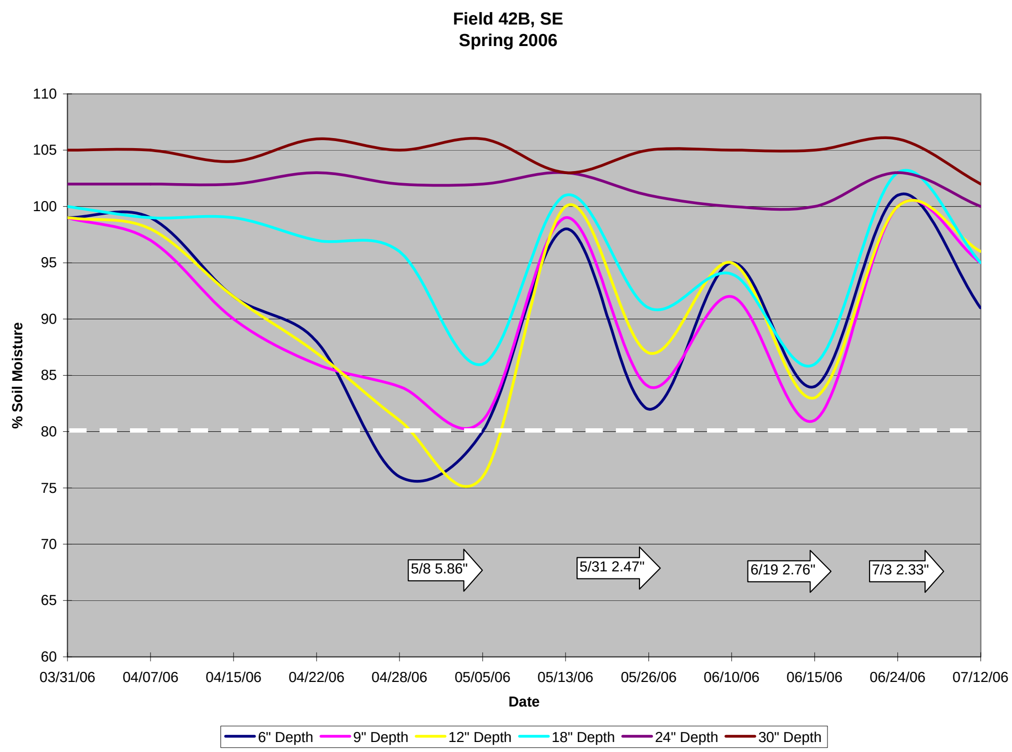
Three sensor sites were selected; the SE site was 50 rows in from the SE corner and 150' inside the field, the SW site was 250 rows from the SE corner and 600' inside the field, the NW site was located 175 rows from the NW corner and 150' inside the field. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 9", 12", 18", 24" and 30". A McCrometer flow meter was used to measure the amount of water applied.

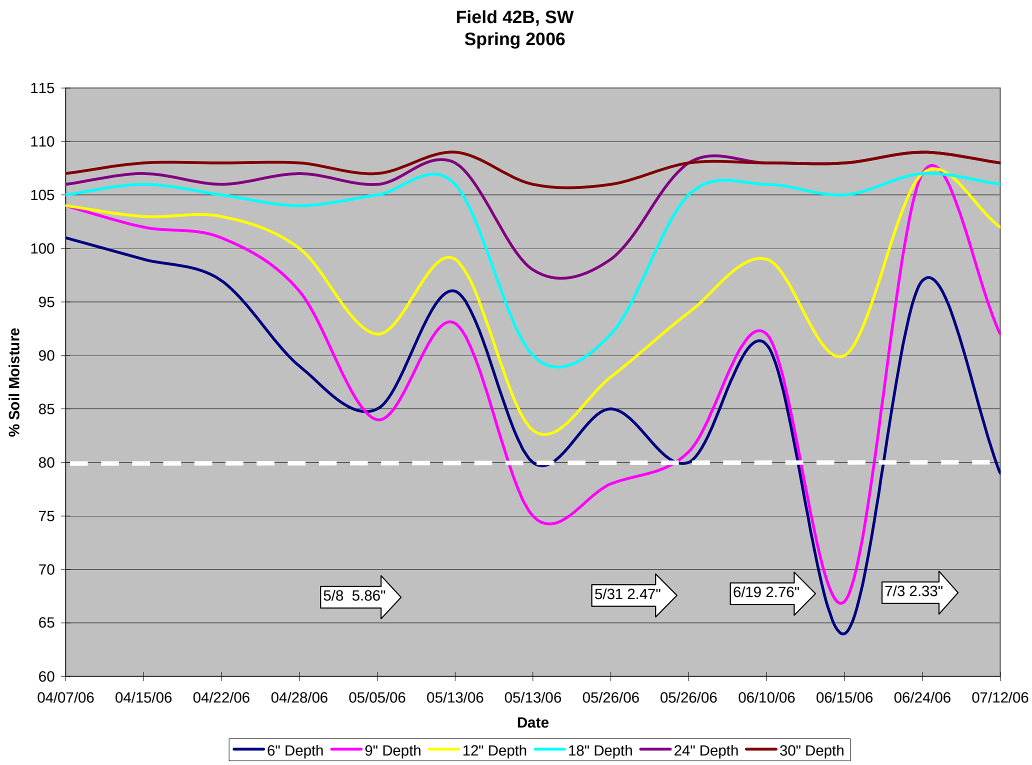
Irrigation Schedule:

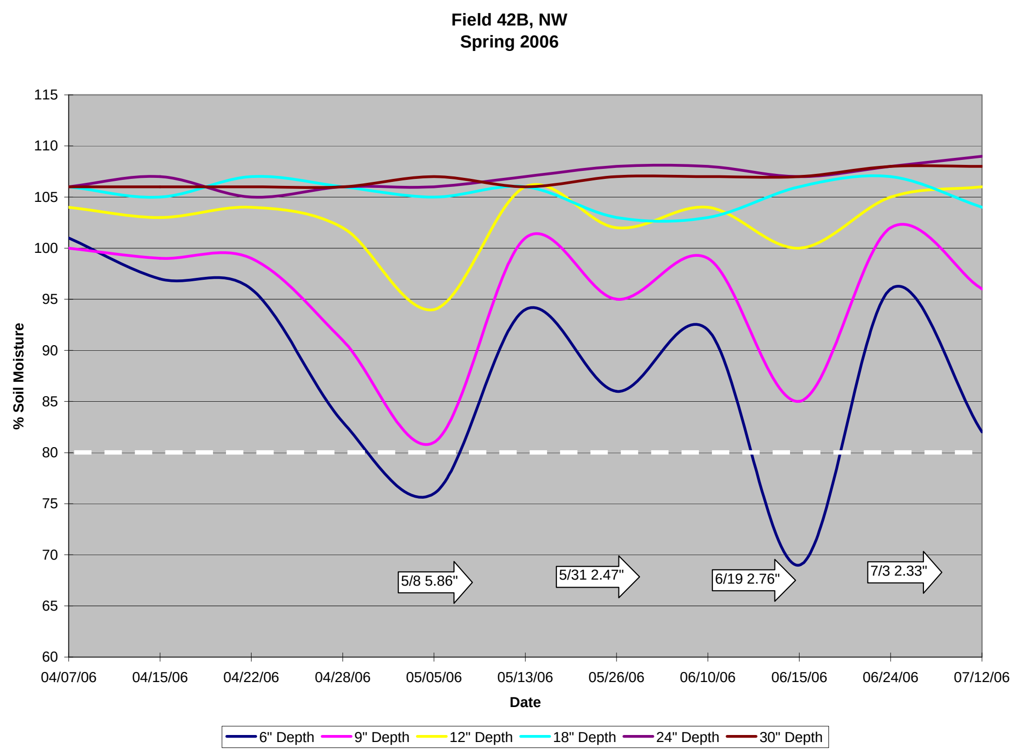
Date	Irrigation Method		Amount of Water Applied, per Acre
5/8	surge		5.86
5/31	surge		2.47
6/19	surge		2.76
7/3	flood		2.33
		Total	13.42"

Irrigation Method:

The entire field was irrigated with the surge technology. The SE chart shows a gradual decrease in the soil moisture from 3/31 through 5/5 with the 6", 9", and 12" lines trending downward together and the 18" line by itself until the 5/8 irrigation. After the first irrigation, the 6", 9", 12", and 18" lines begin to trend alike while the 24" and 30" lines remain stable throughout the entire season. It is interesting to note that the 24" and 30" lines change very little, perhaps due to no uptake by the plant roots due to saturation and/or compaction.







Observations:

High moisture rates were maintained throughout the growing season within the 9” and 12” depths at all 4 sites never dipping below the 80% soil moisture level. Soil moisture levels at the 30” depth were very stable throughout the season.
The SE chart shows a gradual decrease in the soil moisture from 3/31 through 5/5 with the 6”, 9”, and 12” lines trending downward together and the 18” line by itself until the 5/8 irrigation. After the first irrigation, the 6”, 9”, 12”, and 18” lines begin to trend alike while the 24” and 30” lines remain stable throughout the entire season. Perhaps these didn’t change due to no uptake by the plant roots because of saturation and/or compaction.
The SW chart shows a wide swing of moisture readings with the 6” and 9” dipping below the 80% mark around 6/15. All three sites show a spike at this same time, but the severity of the swing at this date is probably due more to cracking at the soil surface than a severe lack of moisture. The moisture levels at all depths, except 30”, are actively changing indicating good soil permeability.
The NW chart shows active moisture changes only at the 6”, 9”, and 12” depths. The soil type at this site is very heavy clay with the 18” – 30” zone fully saturated.
One problem noted with the Aqua-Pro sensor is that when the soil is at saturation the reported soil moisture is many times in excess of 100%. This problem seems to be more prevalent in heavy clay soils.

Economic Summary: Demonstration Sites 42A & 42B

The Demonstration Site 42 analysis consists of a 10-year financial outlook (2006-2015) for the 94 acres of cotton and 66 acres of grain sorghum production under surge irrigation with poly-pipe. It is assumed the cotton and grain sorghum acreage is rotated annually. The analysis assumes a $1,800 cost for a surge valve. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing cost. The initial cotton price is $.56/lb. and the grain sorghum price is $5.00/cwt., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates.

Total crop receipts for the 160 site average $575/acre initially and fluctuate from year-to-year as planted acreages rotate from cotton to grain sorghum production. Peak cash receipt years reflect those years where cotton plantings are the highest. In addition to market receipts, total receipts for the 160 acres include direct and counter-cyclical payments paid to base acres. Cash costs, including $48/acre irrigation costs for cotton and $49/acre for grain sorghum, also reflect the cotton to grain sorghum rotation cycle, requiring roughly $408/acre in the initial year and $350/acre in 2007. Net cash farm income (NCFI) generally follows the cotton to grain sorghum rotation cycle producing $167/acre profit in the initial year and averages $173/acre over the 10-year period. The risk associated with prices and yields suggests that, in a normal production year, NCFI could range as much as $88/acre to $100/acre plus or minus the average expected NCFI.

35. Site # 43, field 43A and 43B Spring 2006

Figure 1

Site Description:

The site is a 17 acre field (43A) planted in cotton and irrigated with Low Pressure Drip and a 39 acre field (43B) planted in cotton and furrow irrigated. The soil type is Harlingen Clay. Field slope is approximately .0005' from the North and .0003' to the East.

Sensor Installation:

One Furrow with a sensor site located 250' from the upper end and another sensor site located 250' from the lower end. Each sensor site utilized 4 watermark soil moisture sensors connected to a Watchdog Data logger for data storage/retrieval. The data loggers were set to record soil moisture readings every 15 minutes. Two sensors were placed 18" deep along the outside shoulders of each bed away from the furrow where the drip tape was buried. The remaining two sensors were located 12" deep along the shoulder of the beds facing the drip tape.

Irrigation Schedule:

LPS DRIP, Field 43A

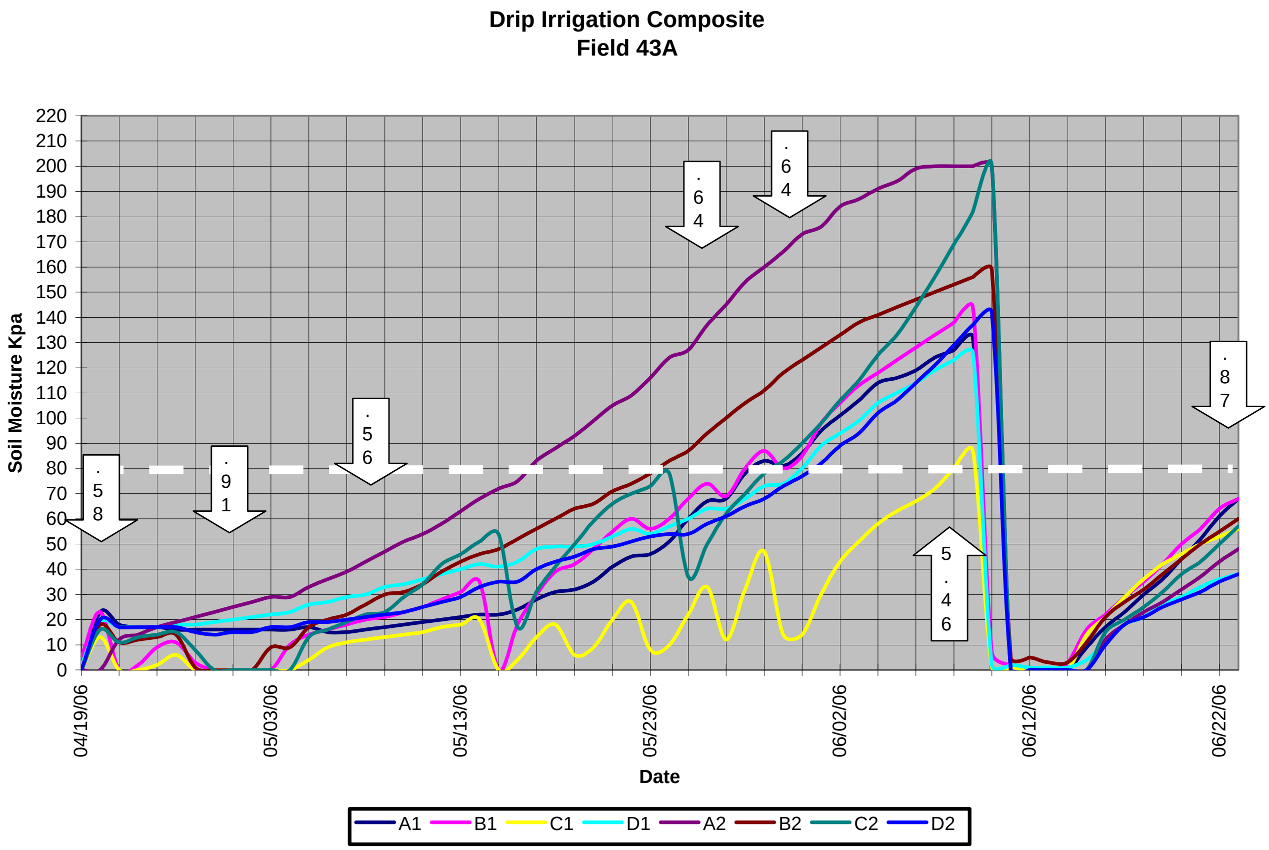
Date	Method		Water Applied
4/20	Drip		.58
4/28	Drip		.91
5/8	Drip		.56
5/26	Drip		.64
5/30	Drip		.64
6/9	Furrow		5.46
6/26	Drip		.87
		Total	**9.66 in**
		Rainfall	**9.29 in**
		Total	**18.95**

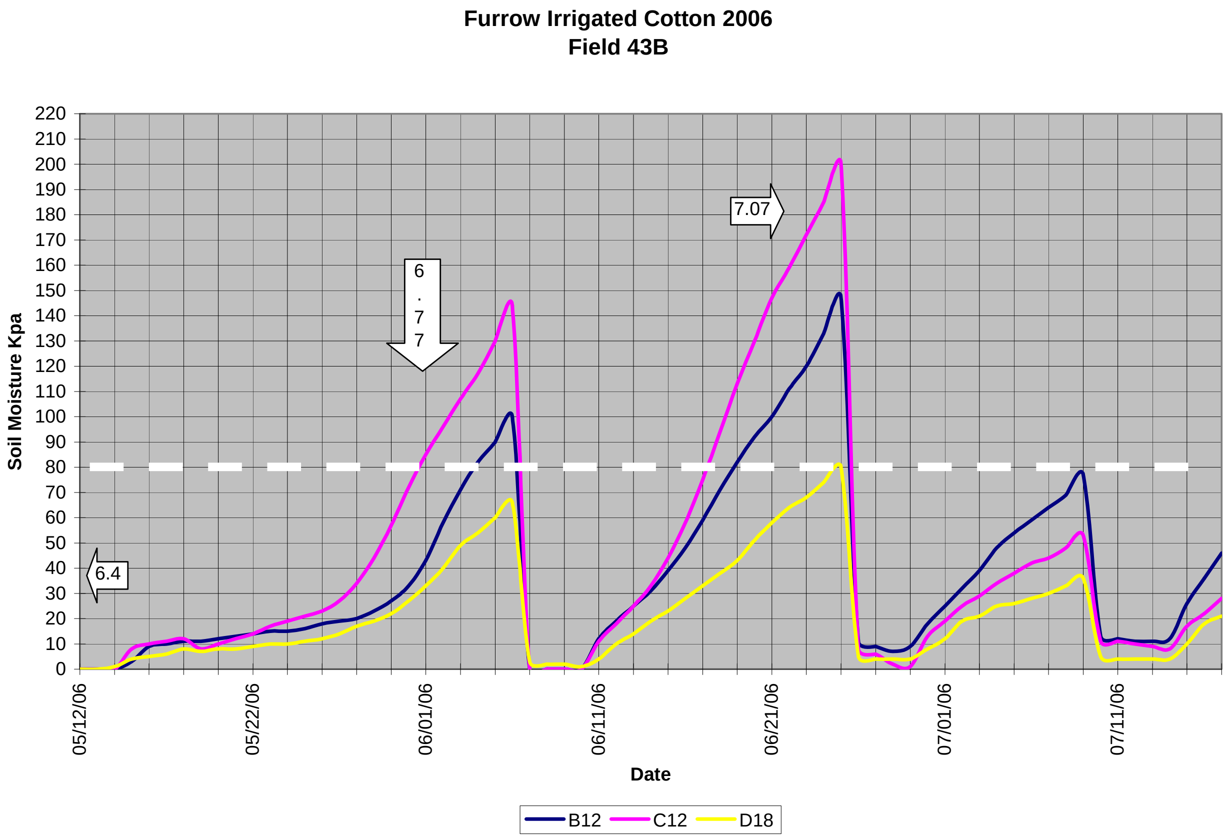
FURROW, Field 43B

Date		Water Applied
5/4		6.4
6/1		6.77
6/22		7.07
	Total	**20.24 in**
	Rainfall	**9.29 in**
		29.53

Irrigation Method:

The Low Pressure Drip (LPS) irrigation system is designed to operate with a head pressure of 3 p.s.i. This system was initially operated with gravity flow at approximately 1.5 – 2 p.s.i., but was later pressurized to 3.5 p.s.i. The drip tape was placed approximately 3” deep in every other furrow. The row spacing was 40”, thus the drip tape spacing was 80” and the row length is 1260’.





Observations:

As the charts illustrate, the water supply did not satisfy the water demand until a flood irrigation was applied. The gravity head pressure wasn't supplying an adequate flow rate and there was a delay caused by pump problems. Additionally, the LPS 8 mil tape plugged with algae while the pump motor was being repaired.

However, the tape was able to be cleaned and performed well for the rest of the season. The irrigation technology allows the grower to apply small amounts of water as needed, but requires careful attention to establish and maintain an adequate amount of available water.

The LPS system applied 52% less (9.66 ac-in) water than the furrow irrigated (20.24 ac-in).

Economic Summary: Demonstration Sites 43A & 43B

The Demonstration Site 43A and 43B analysis consists of a 10-year financial outlook (2006-2015) for the 38 acres of furrow with poly-pipe and 17 acres of drip cotton production. It is not assumed the cotton acreage is rotated annually with another crop.

The initial cotton price is $.56/lb., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates. The drip system costs on average $143/acre/year.

Total cash receipts average about $590/acre acre for both irrigation methods. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Due primarily to the required replacement of drip tape every two years, cash costs, including irrigation costs, average $530/acre acre for the drip compared to $400/acre for the furrow irrigation. Peak cash cost years occur in years where drip tape is replaced. Net cash farm income (NCFI) for the furrow plot averages $190/acre, over three times higher than $60/acre for the drip plot. The risk associated with prices and yields suggests that, in a normal production year, NCFI could range as much as $132/acre plus or minus the average expected NCFI for the furrow site. However, for the drip site, NCFI is projected to be highly volatile with a higher probability of being negative.

36. Site # 44, field 44A Spring 2006

Site Description:

The site is a 38 acre field which was planted in cotton. The irrigation method is furrow irrigation with surge valve technology and the soil type is mainly Harlingen Clay. Field slope is approximately .0005’ from the North and .00025’ to the East.

Sensor Installation:

One furrow was selected with sensor sites 100’ in from the upper end, in the middle of the field, and 100’ in from the lower end. One Aqua-Pro sensor tube was installed at each of the three sites. A tipping bucket rain gauge with data logger was located approximately ½ mile from the field.

Irrigation Schedule:

Date	Amount of Water Applied
3/6	6.32
March rainfall	.87
April rainfall	.66
May rainfall	2.38
6/1	4.52
6/21	2.72
June rainfall	1.12
July rainfall	4.26
Total	**22.85”**

Irrigation Method:

The surge valve is located in the center of the field and the field is divided into two settings on each side of the surge valve. The surge valve was programmed to irrigate one section per side during a 24-hour period. During this 24-hour setting there were six alternations per side based on a variable time scale. The surge controller requires the operator to enter the initial setting time period and then calculates the remainder of the settings. Our initial setting time was 30 minutes. The entire field was irrigated in 48 hours.

Observations:

The initial irrigation in March was flood, not surge, and the numbers tell the story in that the 6.32 ac-in application was the largest single application during the season. The surge technology allowed the grower to apply less water per irrigation.

Economic Summary: Demonstration Site 44A

The Demonstration Site 44A analysis consists of a 10-year financial outlook (2006-2015) for the 38 acres of cotton production under surge irrigation with poly-pipe. It is not assumed the cotton acreage is rotated annually with another crop. The initial cotton price is $.529/lb., including marketing loan deficiency payments. 2006 production costs and overhead charges are producer estimated rates.

The analysis also includes the purchase and use of a surge valve at a cost of $2,200. The surge valve expense is evenly distributed over the 10-year period with the assumption of no financing costs.

Total cash receipts average $592/acre over the 10-year period and cash costs average just under $457/acre, including $40/acre variable irrigation costs. In addition to market receipts, total receipts include direct and counter-cyclical payments paid to base acres. Net cash farm income (NCFI) increases throughout the 10-year period from $76/acre in 2006 to $169/acre in 2015. The risks associated with prices and yields suggest some chances of negative NCFI. In a normal production year, NCFI could range as much as $158/acre plus or minus the average expected NCFI for the site.

37. Site # 45, field 45A 2006

Site Description:

The site is a 36.7 acre field in first year Sugar Cane. The irrigation technology is furrow irrigation with poly-pipe and the soil type is Harlingen Clay. Field slope is approximately .0005' from the North and .0003' to the East.

Sensor Installation:

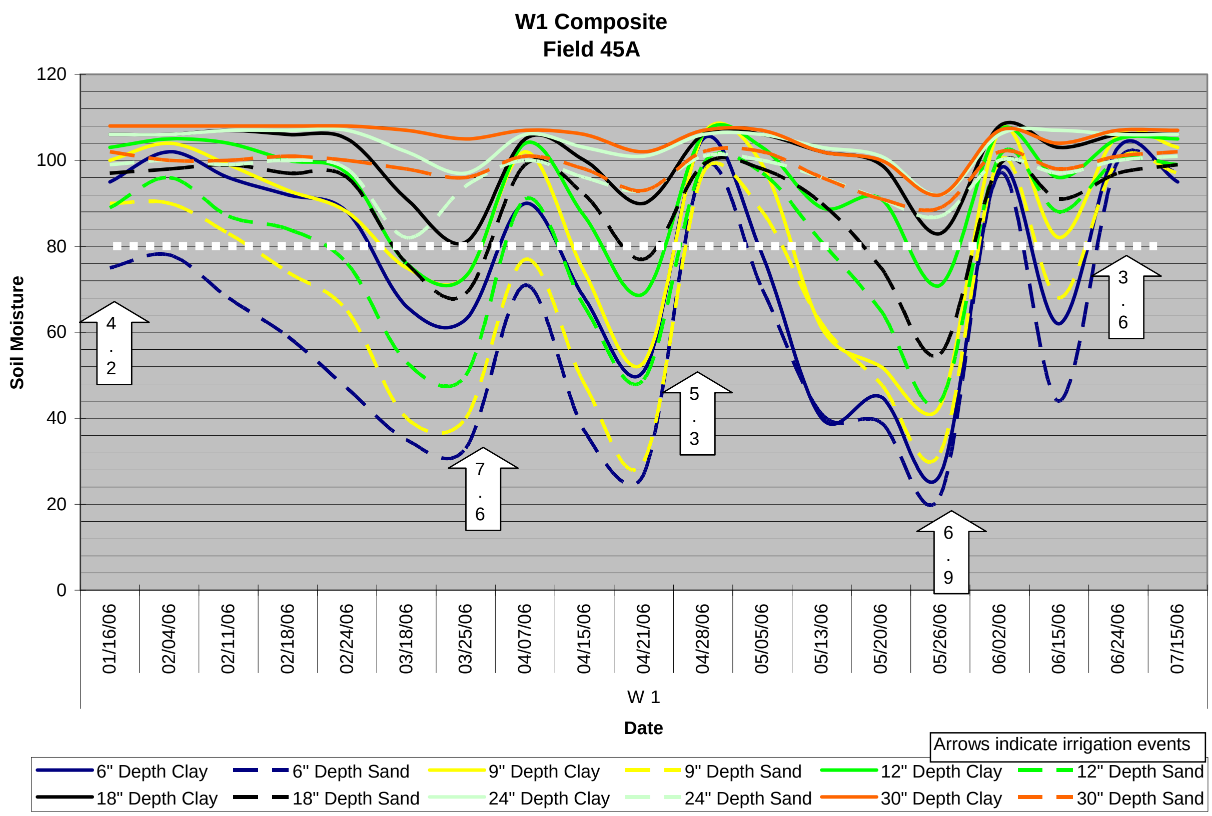
Two rows were chosen with three sensor sites per row. The East row was the 25th row counting from the east side of the field and the West row is also the 25th row counting from the west corner. The #3 sensor sites were located 100' down the row, the #2 sensor sites were located 600' down the row (starting from the north end), and the #1 sensor sites were located 100' down the row (measured from the south end). Two Aqua-Pro sensor tubes were installed at each site. The tubes labeled clay was installed with a slurry made from the topsoil and the tubes labeled sand were installed with a slurry made from a sandy loam topsoil. A Watchdog data logger with three watermark soil moisture sensors buried at 1', 2', and 3' depths was also placed at sensor site E1. Three Echo probe sensors with a Decagon Data logger were installed at sensor site E1 at 1', 2', and 3' depths. McCrometer insertion-type flow meters were mounted into the two field turnouts to measure the amount of water applied. One tipping-bucket rain gauge with a Watchdog data logger was used to measure rainfall events.

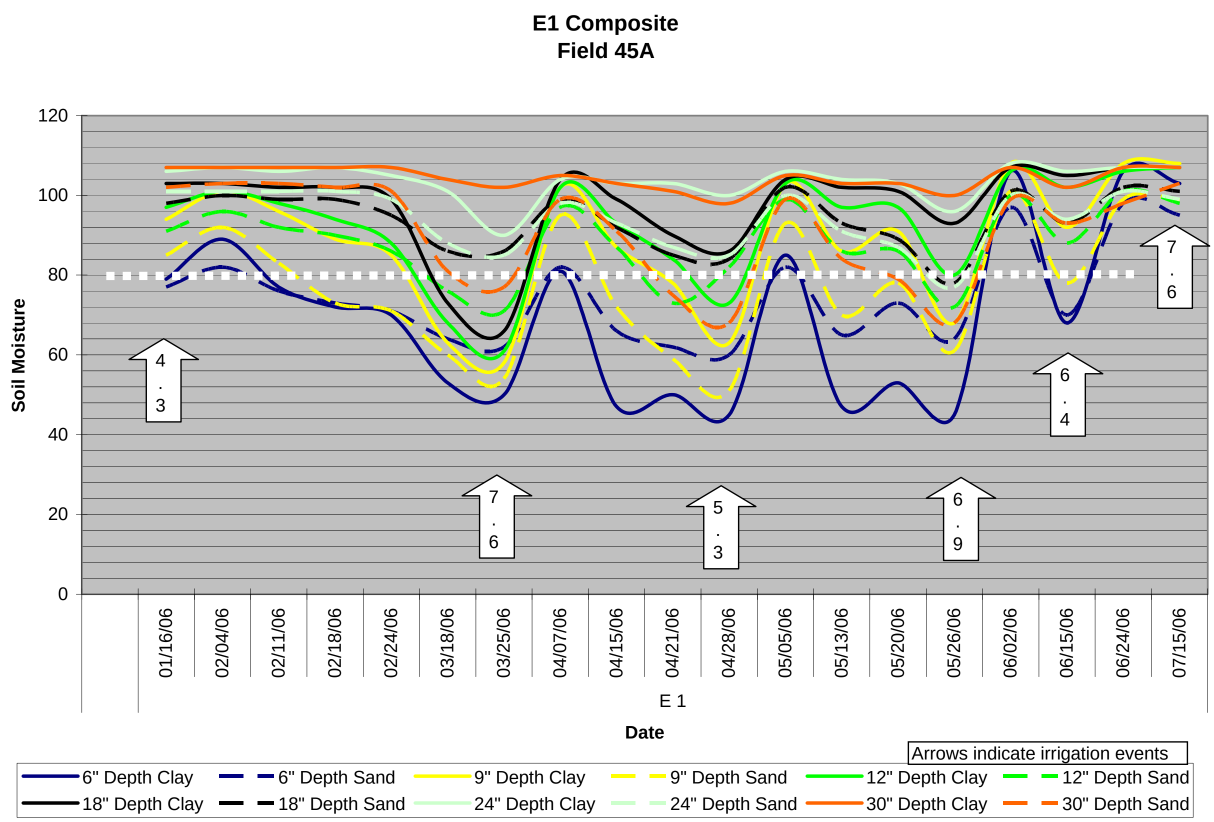
Irrigation Schedule:

Date	Amount of water applied ac-in.
10/3	4.9
11/22	3.99
1/17	4.27
3/28	7.59
4/29	5.28
6/1	6.98
6/20	6.43
7/14	3.63
7/24	7.85
8/5	8.16
Total	**59.08 ac-in.**

Irrigation Method:

The field was furrow irrigated using 18” polypipe with size “A” holes from two field turnouts. One turnout is located at the NW corner and the other is along the NE side. Although a flume was installed to measure tail water, there was no measurable loss.


W1 Composite
Field 45A
Soil Moisture
120
100
80
60
40
20
0
4.2
7.6
5.3
6.9
3.6
01/16/06
02/04/06
02/11/06
02/18/06
02/24/06
03/18/06
03/25/06
04/07/06
04/15/06
04/21/06
04/28/06
05/05/06
05/13/06
05/20/06
05/26/06
06/02/06
06/15/06
06/24/06
07/15/06
W 1
Date
Arrows indicate irrigation events
6" Depth Clay
6" Depth Sand
9" Depth Clay
9" Depth Sand
12" Depth Clay
12" Depth Sand
18" Depth Clay
18" Depth Sand
24" Depth Clay
24" Depth Sand
30" Depth Clay
30" Depth Sand


E1 Composite
Field 45A
Soil Moisture
120
100
80
60
40
20
0
4.3
7.6
5.3
6.9
6.4
7.6
01/16/06
02/04/06
02/11/06
02/18/06
02/24/06
03/18/06
03/25/06
04/07/06
04/15/06
04/21/06
04/28/06
05/05/06
05/13/06
05/20/06
05/26/06
06/02/06
06/15/06
06/24/06
07/15/06
E 1
Date
Arrows indicate irrigation events
6" Depth Clay
6" Depth Sand
9" Depth Clay
9" Depth Sand
12" Depth Clay
12" Depth Sand
18" Depth Clay
18" Depth Sand
24" Depth Clay
24" Depth Sand
30" Depth Clay
30" Depth Sand

Observations:

The attached charts illustrate the soil moisture, expressed as a percentage of moisture available, variations over time. The charts show a conservative use of irrigation water with the available moisture readings, at the depths of 12" and greater, staying above 70% except for a two-week period during March. The center of the field (E2, and W2) was drier than the ends. The Aqua-Pro sensor and buried tubes perform well, allowing the user to monitor the available soil moisture at various depths from the surface to 30". The soil develops substantial cracks during the wetting and drying cycles. It is these surface cracks which cause the 6" depth readings to fluctuate more than any other. The sensor tubes installed with the clay slurry were more prone to surface cracks than the tubes installed with the sandy loam slurry. However, there were roots which followed the sandy loam slurry which caused the larger soil moisture fluctuations at the 24" and 30" depths. The Watermark sensors and Watchdog data logger performed well and offered the advantage of continuously recording measurements on 15 minute intervals. The Decagon data logger and Echo probes also performed well and offer the same benefit of continuous recording. One problem noted with the Aqua-Pro sensor is that when the soil is at saturation the reported soil moisture is many times in excess of 100%. This problem seems to be more prevalent in heavy clay soils.

Economic Summary: Demonstration Site 45

The Demonstration Site 45 analysis consists of a 10-year financial outlook (2006-2015) for the 38 acres of sugarcane production under furrow irrigation with poly-pipe. The initial outright purchase of sugarcane grinding rights ($800/acre) with no financing is included. The baseline scenario produces a negative cash position the first two years, but no interest was charged on carryover balances. For the 10-year outlook projection, the sugarcane price is based on the producer's estimate of future prices and is held at an average of $17 per ton. 2006 production costs and overhead charges are producer estimated rates.

Total cash receipts average just over $849/acre initially and decline as the productive capacity of the sugarcane diminishes until the sixth year when the land is idle. Cash costs, including $56/acre in variable irrigation costs, also reflect the sugarcane production cycle, requiring roughly $555/acre in the initial year, about one-half that amount in subsequent years and approximately $130/acre in the idle year. Average net cash farm income (NCFI) generally follows the sugarcane production cycle producing $294/acre profit in the initial year and peaking at $456/acre the second year. It averages approximately $255/acre per year for the assumed 6-year sugarcane cycle. The risk associated with prices and yields suggests that, in a normal production year, NCFI could range as much as $184/acre to $211/acre plus or minus the average expected NCFI.

38. Site# 47, field 47A and 47B Spring 2006

Site Description:

The 39 acre field was planted in corn and is divided into two sections, 47A is the eastern part of the field with 20 acres and 47B is the western part of the same field with 19 acres. The soil type is Raymondville clay loam. Surge irrigation technology was used for field 47B and flood irrigation was used for field 47A. The eastern part, 47A, has a slope of .00005' and the western part 47A has a slope of .0001'.

Sensor Installation:

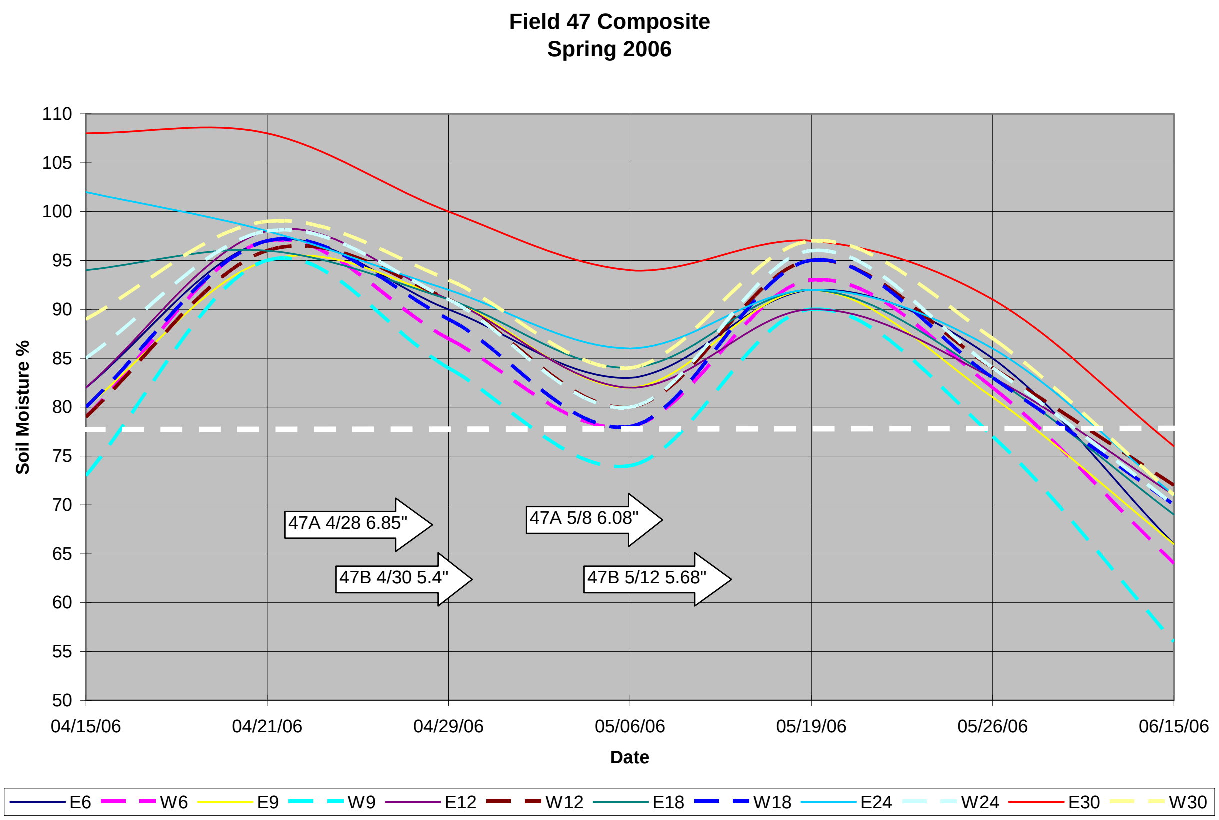
Two furrows, one East and one West which were 50 rows from the edge, were selected with sensor sites located 200' from the lower end. One Aqua-Pro tube was installed at each sensor site and measurements were taken weekly at the following depths; 6", 9", 12", 18", 24" and 30". A McCrometer flow meter was used to measure the amount of water applied.

Irrigation Schedule:

Date	Field	Irrigation Technology	Water Applied per Acre
4/28	47A	flooded furrow	6.85
4/30	47B	surge	5.4
5/8	47A	flooded furrow	6.08
5/12	47B	surge	5.68
Total	47A	flooded furrow	12.93"
Total	47B	surge	11.08"

Irrigation Method:

The surge controller was programmed to complete the irrigation cycle in 24 hours with the first alternation to occur at the 5 hour interval. The cooperator used 18" diameter polypipe on both fields. The surge controller was programmed to alternate 6 cycles in a 24-hour period.



Observations:

The surge technology did not deliver substantial savings in the amount of water applied. The curves show that the soil moisture lasted longer with the flooded furrows than with the surge irrigation. Since the Raymondville clay loam is much more permeable than the Harlingen clay, it is possible that the steeper slope of the surge field lessened the opportunity time for deeper percolation of the irrigation water when compared to the flatter part of the field. The cooperator liked the surge technology well enough to use it again for the following spring, noting better uniformity and moisture retention than what he had experienced in the past with flooded furrow irrigation.

One problem noted with the Aqua-Pro sensor is that when the soil is at saturation the reported soil moisture is many times in excess of 100%. This problem seems to be more prevalent in heavy clay soils.

Economic Summary:

Economic summary for this site has not been completed.

Appendix E

Flow Meter Calibration Facility

Table of Contents

Foundation and Building

The construction of the Flow Meter Calibration Facility began in April of 2006. The contract for the foundation labor was issued to Joe Farias and materials were the responsibility of Harlingen Irrigation District. The form work was completed in accordance with the Engineers design in late April. Due to the nature of the pours the

District hired L&G Concrete to pump one hundred and seventy two yards of concrete for the foundation. The foundation was poured in three parts and this began the first part of May 2006.

The design called for a 60' x 100' x 12' open sided building. After reviewing several bids the District purchased the building from Muller Buildings Inc in April of 2006. The building was delivered in May and the District hired AAA crane service to erect the building. Erecting began mid May 2006 and was completed in two weeks.

Office and Meeting Room

Upon completion of the shell erection, District personnel began construction of the 20' x 40' office and meeting room facilities. This facility consists of a 20x30 meeting room with one restroom and an office /control room. Electrical and plumbing work was

Meeting Room

Office/Control Room

contracted to Parish Electrical and Plumbing. The District hired two local building tradesmen to finish the interior of the office as well as lay the tile floor. All building construction was done in compliance with the building codes of Cameron County Texas. The construction was inspected on a regular basis by Cameron County building Inspectors as well as Texas Water Development board inspector Juan Bujanos. The foundation, building and office facilities were completed in November of 2006.

Water Conveyance System

The District began construction of the water conveyance portion of the Flow Meter Calibration Facility in June of 2006 with the construction of the water diversion box. This box is used to divert the water pumped from the inlet channel to three pipelines. One feeds the open channel flume, one feeds the closed pipe manifold and one feeds the discharge to the main canal. The diversion box is constructed of a twelve inch foundation with a four foot wall topped with two nine feet by 7 feet concrete boxes. The box is divided by a sixteen foot head wall to provide a constant head to the facility. The over flow from the headwall is diverted back to the inlet channel. The diversion is controlled by three twenty-four inch slide gates in the diversion box.

Completed Diversion Box

Diversion Box Foundation

Setting the Concrete Boxes

Open Channel Flume

Upon completion of the diversion box work began on the open channel flume. This flume is designed to demonstrate and calibrate open channel water measurement devices. The flume is three feet wide by four feet deep and one hundred and forty feet long. The fall from high end to low end is .083 inches per foot. It is divided into ten foot sections by two inch aluminum channels imbedded in the concrete wall allowing for the placement of control gates and check structures. The flume discharges into the inlet channel allowing for recirculation of water. There are also four, eight inch discharge pipes placed along the outside of the flume for canal turn out simulation.

Flume inlet with Sharp Crested Weir

Flume Discharge with Broad Crested Ramp

Water flowing over Sharp Crested Weir at a rate of 6.5cfs

Water over Broad Crested Ramp at a rate of 6.5 cfs

Closed Pipe Manifold

The closed pipe manifold was designed to calibrate insertion type meters for pipe sizes ranging from twenty-four inches to six inches in diameter. The manifold was built by Morrill Industries and assembled by District personnel. At the inlet of the manifold are two Siemens certified 6000 Mag flow meters. A twenty-four inch meter for high flows and a twelve inch meter for low flows. The manifold is designed to allow for inter-changeable pipe diameters and many flow meter configurations.

Calibration Tank

In addition to the Mag Meters the District has constructed a calibration tank to measure the flow of water volume over time. Water can be diverted from the open channel flume as well as the closed pipe manifold into the tank for a more precise flow measurement. The tank is built on a twelve inch thick one hundred and forty four square foot foundation topped with two ten by ten concrete boxes and a four foot poured concrete wall. The tank has a fifteen inch discharge that is controlled by an air operated flush valve.

Calibration tank and discharge/flume foundation /drain pipe.

Calibration tank 15" discharge pipe.

Calibration tank poured wall and flume end.

Manifold discharge and calibration tank

Catwalk and Viewing Platform

For easier access and viewing of the demonstration area the District constructed a catwalk and viewing platform. This structure allows for the mounting of electrical conduit and data cable conduit as well as access to both sides of the flume and pipe manifold.

Control and Automation

The District has purchased a rack mounted pc for control and automation of the Flow Meter Calibration Facility. The pc and related software will allow the facility operators to control and demonstrate many methods of total canal automation and control as well as perform calibration on meters. The system consists of the rack mounted pc, one SCADA system for data acquisition and control, a 48 to 24 channel patch panel to route data in and out of the control room and a wireless interface for communication with external devices such as laptop computers. The installation and programming of this system as well as installation of flow measurement devices is the majority of the work left to complete at the facility. We expect to have this work completed in May of this year.

The District has solicited many flow measurement device manufactures for donations of devices for demonstration and automation of the facility. To date we have received positive responses from Rubicon Systems America, Siemens, Sontec and Seametrics. Over the next several months the District will be working with these companies to install their devices for demonstration and evaluation purposes as well as aids in the automation of the facility. We have also begun contacting all the irrigation districts in the Rio Grande Valley to survey the needs of the individual districts to better prepare for the type of meters we will calibrating.

Use of Facilities

Since the completion of the meeting room facilities in November, the District has had the opportunity to host several workshops and grower information meetings. In December of 2006 the District hosted a USDA-NRCS EQIP information meeting. This meeting was well attended by growers and agency personnel alike. Also in December we held an ADI managers meeting to discuss data collection and the building of the irrigation information database.

In February the District in conjunction with Cameron County Extension, Texas A&M Extension and USDA-NRCS held its second water management workshop at the new Flow Meter Calibration Facility meeting room. The workshop was attended by approximately 20 growers and agency personnel. We have planned another Water Management workshop for May 2007.

Enrigue Perez , Cameron County Extension Agent, addressing the attendees of the Water Management Workshop

Annual Progress Report for 2006

March 1, 2006 through February 28, 2007

for Work Under

Maximization of On-Farm Surface
Water Use Efficiency by Integration of On-Farm
Application and District Delivery Systems

Texas Water Development Board
Agricultural Water Conservation
Demonstration Initiative Grant

Submitted to:

Harlingen Irrigation District
Cameron County No. 1
Harlingen, Texas

February 28, 2007

AXIOM-BLAIR ENGINEERING

P.O. Box 150069
Austin, Texas 78715
www.axiomblair.com

Table of Contents

LIST OF TABLES

1. Introduction and Overview

This report contains the annual progress report for the Agricultural Demonstration Initiative Project as indicated in the Scope of Work contained in the contract between Harlingen Irrigation District – Cameron County No. 1 (HIDCC1 or the District) and Axiom-Blair Engineering, L.P. (ABE). A description of the overall progress, description of any problems encountered that have any effect on the study, delay of the timely completion of work or change in the deliverables or objectives of the contract are discussed, as well as any corrective actions necessary.

During the year 2006, ABE was tasked to provide the following general support to the project:

- Subcontracting Contract Execution: The Subcontractor will assist the District in preparing and executing the subcontracts with Delta Lake Irrigation District, Texas A&M University Kingsville, and others to provide support and services to the District on the primary contract.
- District and On-Farm Flow Meter Calibration and Demonstration Facility: The Subcontractor will provide civil engineering services to: 1) diagram the flow meter pipe and placement layout; 2) diagram the test canal configuration depicting weir and test gate locations and layout; and 3) PLC programming; and 4) other technical support as necessary to conclude the design and implementation of the facility.
- Demonstration of Internet Based Information Real-Time Flow, Weather, and Water User Accounting System: The Subcontractor will assist the District in finalizing the development of the real-time flow, weather, and water user information system (RTIS), with computer programming services to extend the current SCADA software to display flow rate and other information from the District's secondary On-farm flow measurement telemetry system, and incorporate portions of the existing water use accounting system into the internet display application. The Subcontractor will also develop new RTIS software to collect real-time rainfall measurements at five telemetry sites along with software to collect weather station information at two of those sites, for display within the current Internet display application. The two weather station sites will be incorporated into two of the existing primary telemetry sites. The District shall make the District's water user accounting system and any programming consultant for the system available to the Subcontractor and such programming consultant may be retained by the Subcontractor for the purposes of providing the necessary software interface between the water user accounting system and the RTIS. The Subcontractor will assist the District in documenting the features and capabilities of the RTIS.

- Technical Support: The Subcontractor will provide engineering and other technical support to the District, as directed, regarding efforts to sustain the primary contract task or support other subcontract activities.
- Variable Speed Pump Control and Optimization of Delivery of On-Farm Demands: The Subcontractor will provide assistance to Delta Lake Irrigation District (DLID) in the design, implementation, and purchase of the pump controller/PLC to use with DLID pump equipment to demonstrate the use of internal combustion engines in matching the quantity of water diverted from the district canal for meeting irrigation demands. A technical workshop and the associated training materials will be prepared for training district managers in the proper design, installation, and cost of installing and operating variable speed drives, and the associated pumping and pipeline systems.

The following sections address the specific Scope of Work between the District and ABE, and the work completed on each task during March 2006 through February 2007.

2. Scope of Work

The Task Descriptions and work provided for each Task is discussed below.

2.1 Subcontracting Contract Execution

2.1.1 Task 1 Description

The Subcontractor will assist the District in preparing and executing the subcontracts with Delta Lake Irrigation District, Texas A&M University Kingsville, Texas Cooperative Extension, and others to provide support and services to perform the work task.

2.1.2 Work Completed

The subcontracts for Delta Lake Irrigation District, Texas A & M University Kingsville, Texas Cooperative Extension, and others were completed. Contract modification work requested by TWDB has been completed.

2.2 District and On-Farm Flow Meter and Demonstration Facilities

2.2.1 Task 2 Description

The Subcontractor will provide civil engineering services for the design of the facilities, including but not limited to preparing site plan drawings, pump and piping system layout, open channel flow measurement system, pump and remote control specifications, construction bid and contracting documents, and preparation of environmental summary reports for submittal by the District to Texas Historical Commission, Texas Parks and Wildlife Department, and the US Army Corps of Engineers.

2.2.2 Work Completed

A Flow Meter Calibration and Demonstration Facility was constructed in 2006 and early 2007. The primary work in 2006 consisted of site review of construction, design and bidding of the flow meter manifold system, and design of the SCADA control system. Engineering drawings for the manifold system are available from the district.

The remaining design work for the Calibration Facility includes flow meter pipe The only engineering work remaining for the Calibration Facility consists of wiring in the SCADA control system and development, installation of the automatic gate and variable speed motor controllers, and software development for the control system

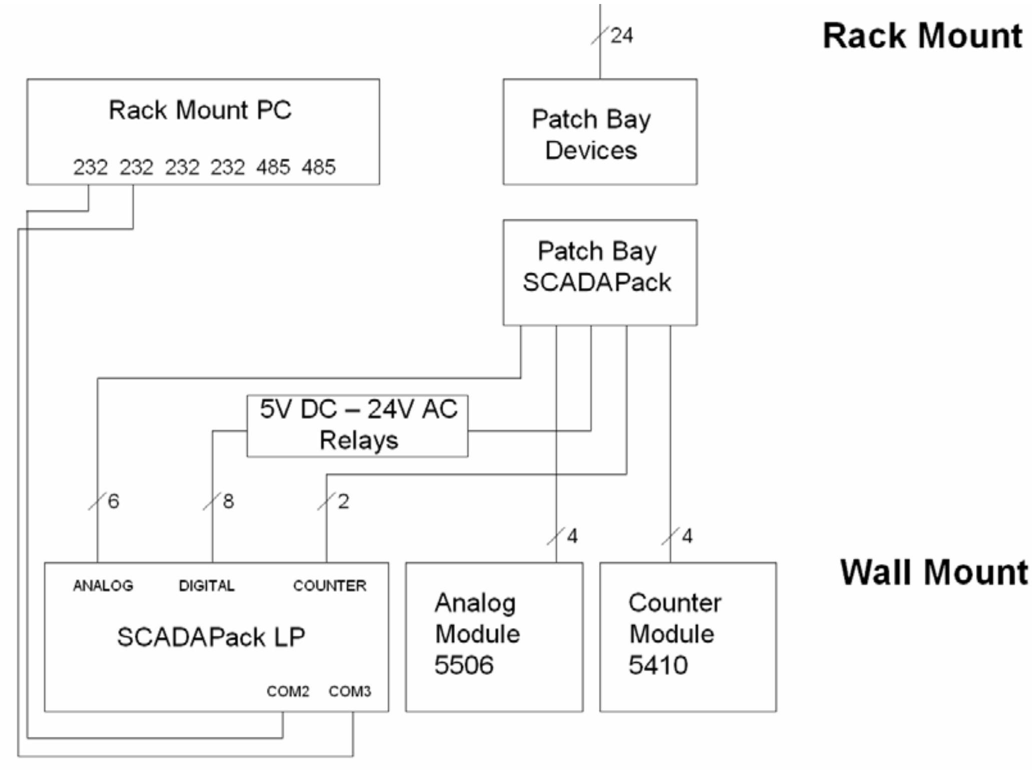


Figure 1 – Block Diagram of Flow Meter Calibration Facilty SCADA System

. Figure 2 – Flow Measurement Manifold System

2.3 Demonstration of Internet Based Information and Real-Time Flow, Weather and Water User Information (RTIS)

2.3.1 Task 3 Description

The Subcontractor shall assist the District in developing the real-time flow, weather, and water user information system (RTIS), including computer programming services such as those necessary to develop the software to display specific District information from the District's existing flow measurement telemetry system and existing water use accounting system on the internet. The Subcontractor shall develop the necessary software to collect real-time rainfall data from five locations selected by the district and co-located at existing flow measurement telemetry nodes and display such rainfall data on the District's web site. The Subcontractor will assist the District in preparing a document that defines the features and capabilities of the RTIS, and the Subcontractor shall use this document in developing the RTIS software. The Subcontractor shall make use of the District's water user accounting system and any programming consultant for the system and such programming consultant shall be retained by the Subcontractor for the purposes of providing the necessary software interface between the water user accounting system and the RTIS.

2.3.2 Work Completed

The initial phase consisted of development of a general website for HIDCC. This task was completed on August 15, 2005. The second phase consists of developing the computer programming necessary to display flow measurement data from HIDCC telemetry server in real-time over the Internet. This phase was completed in November of 2005 and the system is operational. Additional meters and rain gauges are being added to the web display system as such devices become operational.

The third phase consists of development of software for secure access to on-farm flow meter records, water use charges, and water billing by interfacing the Internet server with the District's existing accounting system computer. The District water accounting software is being updated by a third-party at the District's expense, and this software update needs to be completed before significant progress can be made in this phase. Initial work on this phase addresses the accounting and water ticket database fields related to user information such as property identification, crops, requested water amounts, times, etc.

The following is an initial release of the information that outlines the features and uses of the Internet accessed real-time flow, weather, and water user information system (RTIS). The following details how to locate and use the RTIS website, and how to select a pumphouse and water deliveries to view as an example of navigating the website. The source code for this part of the RTIS software system is attached as Appendix F.

2.3.2.1 HID Internet Website RTIS Reporting User Guide – Part I

Welcome to the Harlingen Irrigation District Agricultural Water Conservation Demonstration Initiative Internet Based Information project! This documentation outlines the features of the Internet accessed Real-Time flow, weather and water user Information System (RTIS) and how to use it. The web interface to the system is available on the district's website, which is located at http://www.hidcc1.org. After navigating to the district website, select Telemetry as shown below in Figure 2.1.

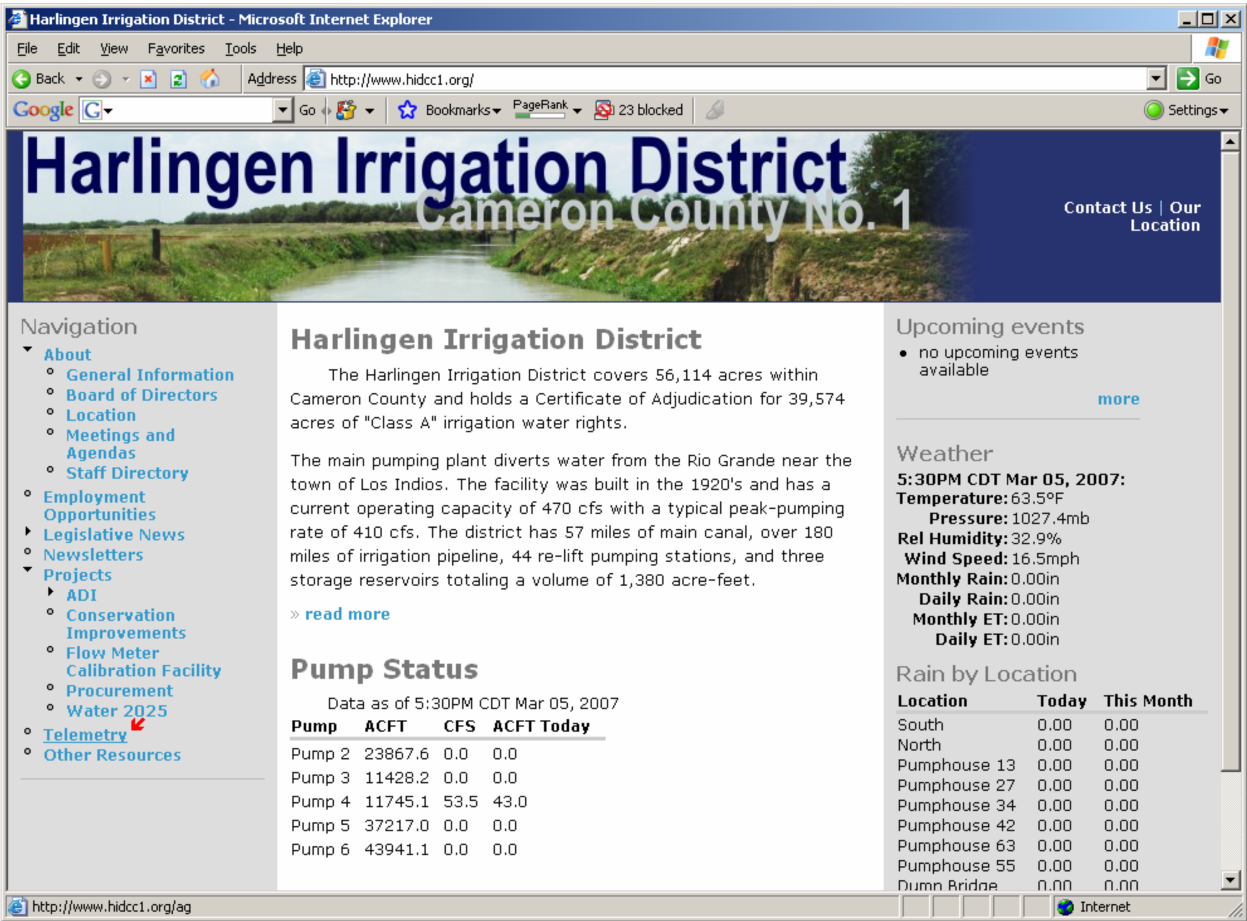


Figure 2.3.2.1.1: Harlingen Irrigation District Web Site Main Screen

Now at the Telemetry Main Page, you are shown a list of site groups which may be expanded to reveal sites and data points.

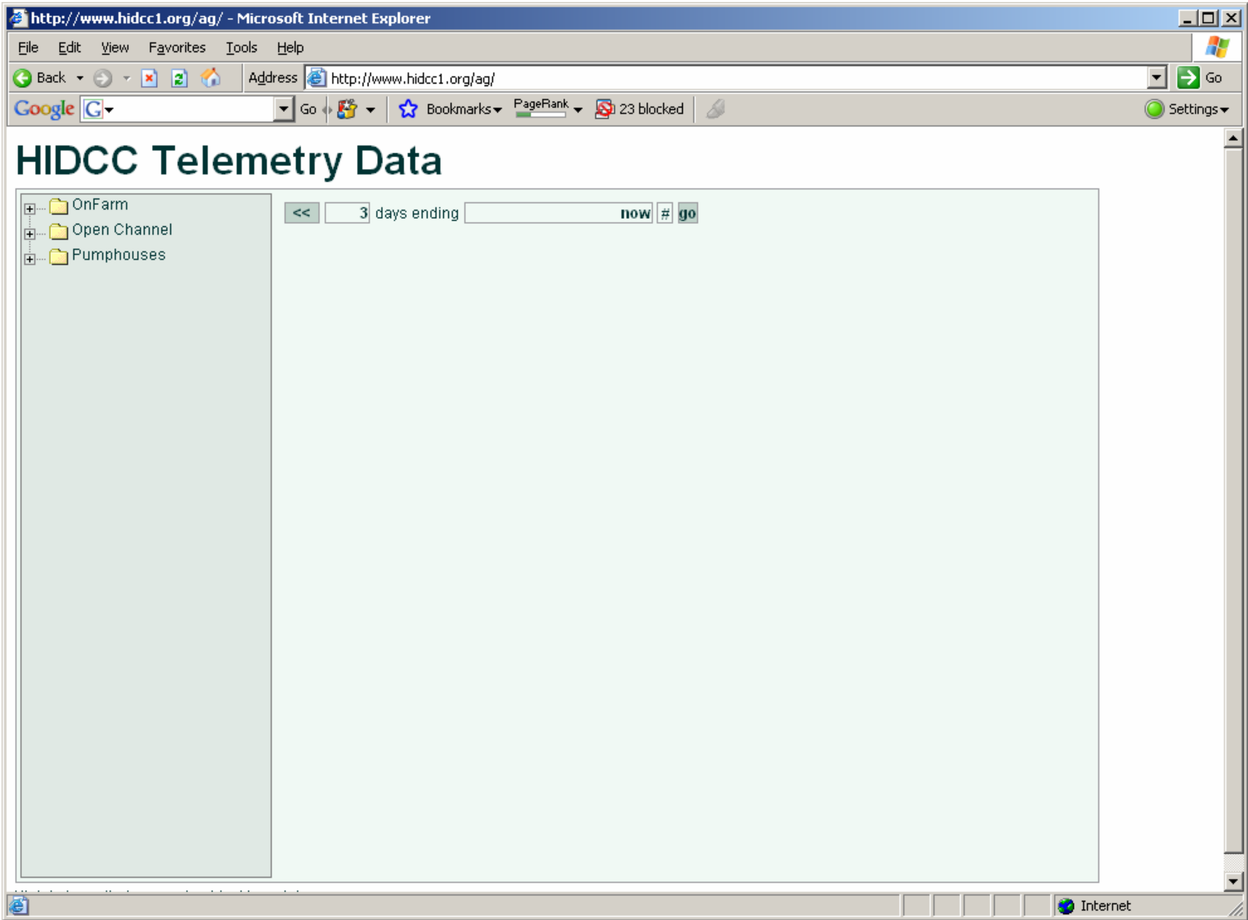


Figure 2.3.2.1.2: Telemetry Main Page

Once at the Telemetry Main Page, you may expand the desired section by clicking the Plus sign (+) to the left of the folder you wish to examine, then select a specific site by clicking on that site's text label or expand the site to display a single graph from the site.

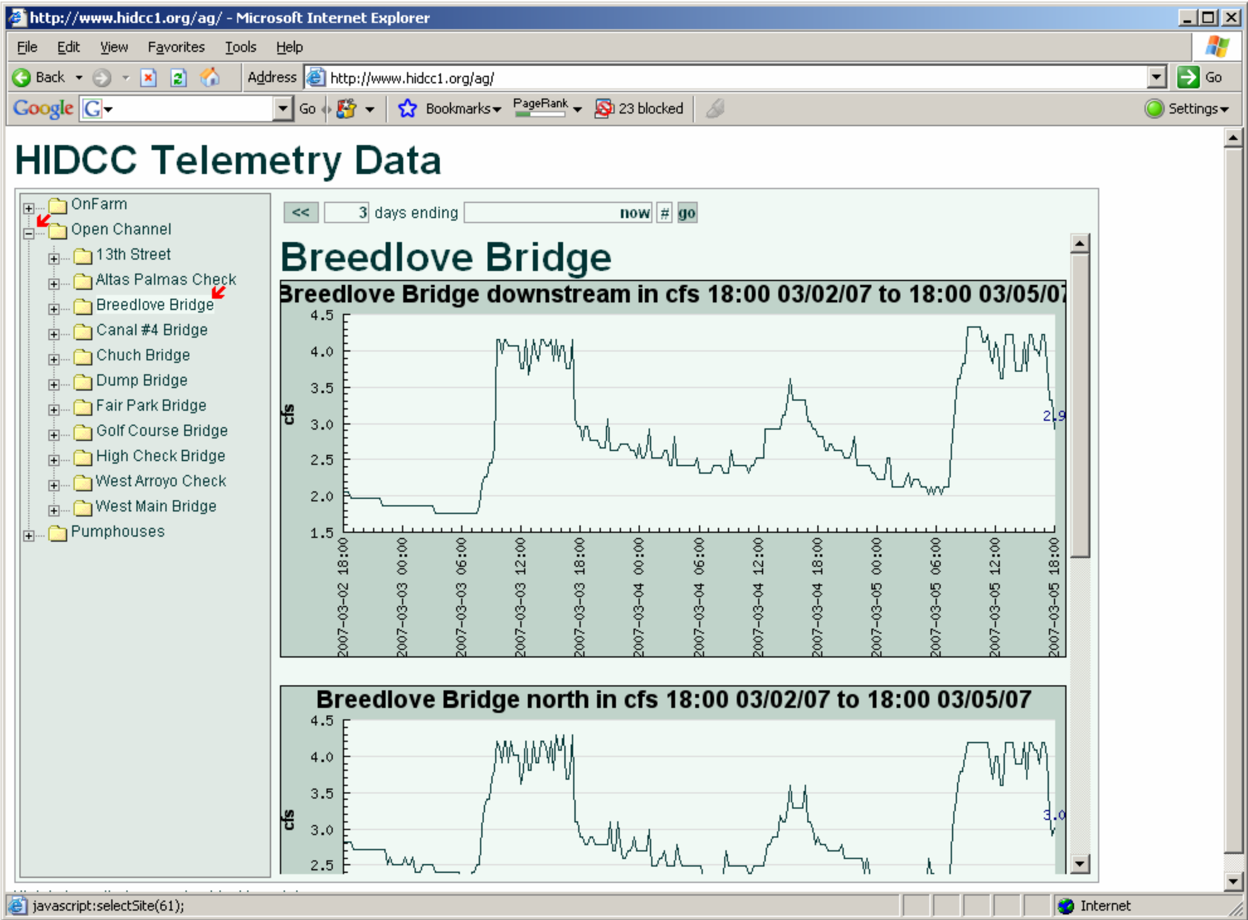


Figure 2.3.2.1.3: Telemetry Data Display

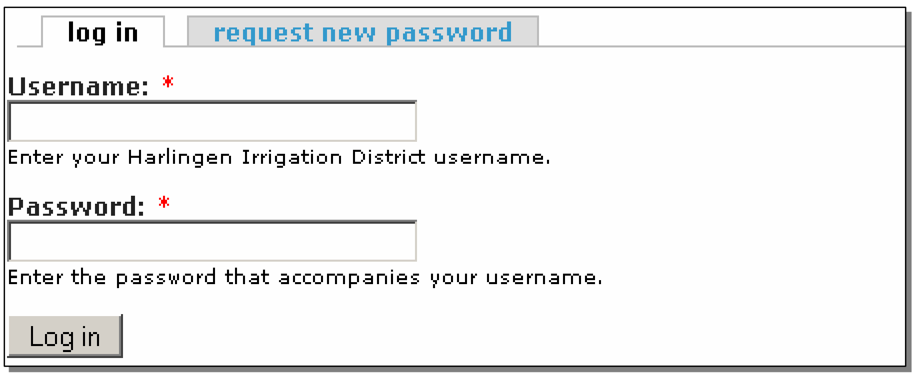
2.3.2.2 Website CMS (Content Management System)

2.3.2.2.1 System Overview

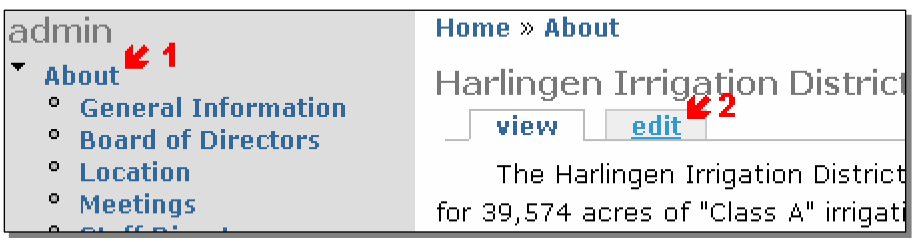
This brief users' guide provided a basic reference to editing, adding, and removing documents from the hidcc1.org website using the Content Management System. Using the CMS, you will be able to make changes to the website using our completely web-based interface.

2.3.2.2.2 Logging in

To log in to the Content Management System, point your web browser to http://www.hidcc1.org/user and enter your username and password.

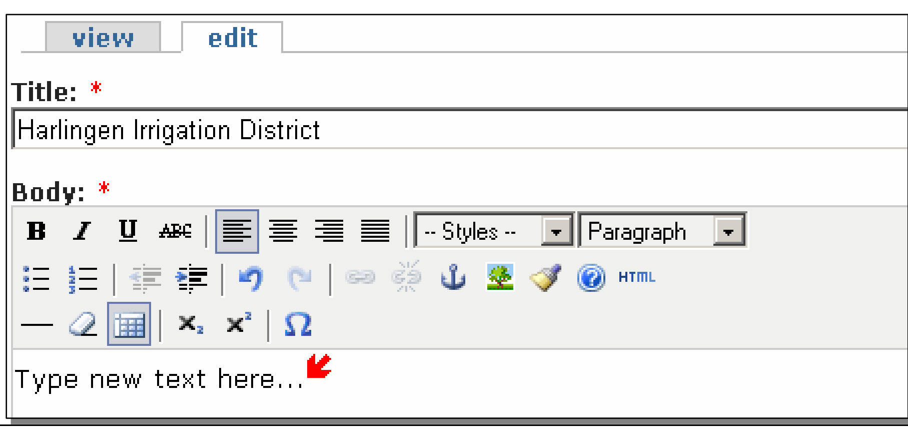


2.3.2.2.3 Updating Existing Content



To update existing content, log in and select the page you would like to edit from the grey menu on the left (1), and then click the 'edit' tab at the top of the page (2).

Next, edit the page as desired in the Body field.

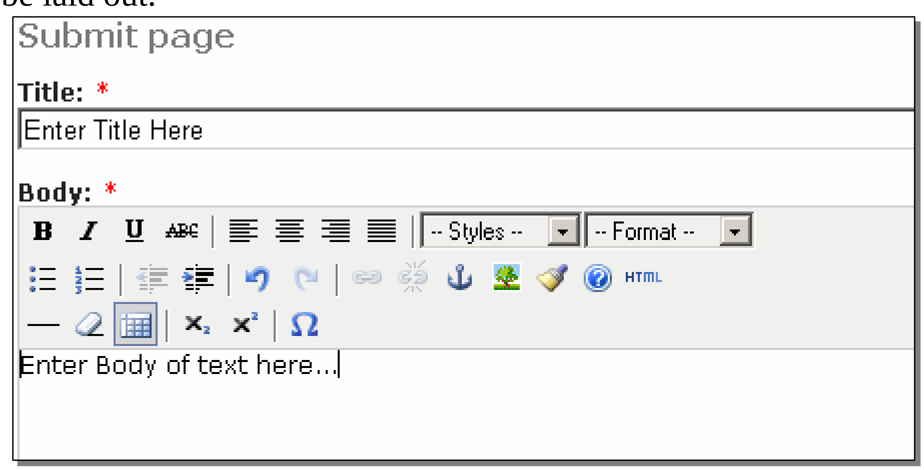


You may also alter how the page is listed in the site menu under ‘Menu settings’ or add/remove file attachments under ‘File attachments’. Finally, remember to click ‘Submit’ when you are pleased with the changes that you’ve made.

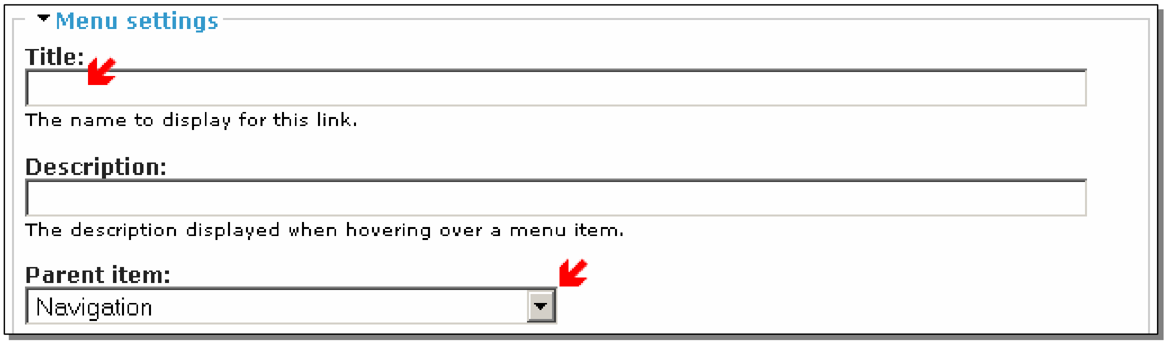
2.3.2.2.4 Creating New Content

If you would like to add a new page, log in and under the grey menu on the left, select ‘create content’. You will then have a choice of what type of item you would like to create. For general web pages, select ‘page’, to add an item to the upcoming events calendar, select ‘event’.

You must enter something for both the Title and Body of every item that you create. You may use the formatting toolbar above the Body section to select how you wish your item to be laid out.



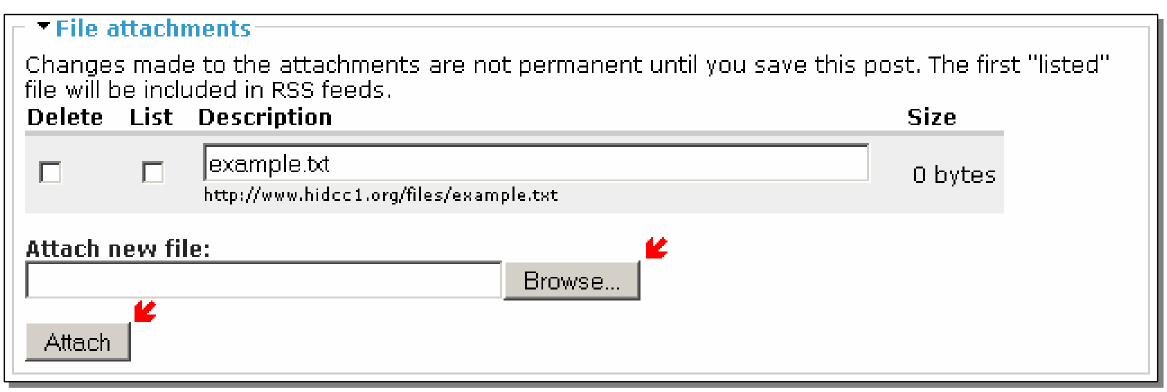
If you would like the item to be listed in the Navigation menu on the left so that users will be able to find it, you will need to specify how and where it should be listed. You will do this by expanding the 'Menu settings' section and entering the label you would like to appear in the menu in the 'Title' box and selecting the menu section under which you would like the item to appear.



If you would like this item to be displayed on the front page when users visit the site, select 'Promoted to front page' under 'Publishing options'.

2.3.2.2.5 Posting Files

To post a file, you will use the 'File attachments' section. Click on 'File attachments' to expand the section. Next click 'Browse' to bring up the file selection dialog and select the file that you wish to post. Use the 'Browse' button instead of typing the filename directly. Do not alter the contents of the 'Attach new File' box; if you would like to label the file differently you will have a chance to do so later. After using the 'Browse' button to select the desired file, click 'Attach'. Wait for the file to upload, then you will see it listed along with any other files currently attached to the page. If you would like the file to be listed for users to find and download, select the 'List' box next to the file. If you are uploading an image to be displayed on the page (as described later), leave the 'List' box unchecked. If you would like to give the file a label besides its filename, you may enter it in the box below 'Description' after Browsing and Attaching it. As always, be sure to click 'Submit' at the bottom of the page after making changes. You must do this before the files will become available to you or anyone else. If you need to post an attachment type that is not currently allowed, contact your system administrator.

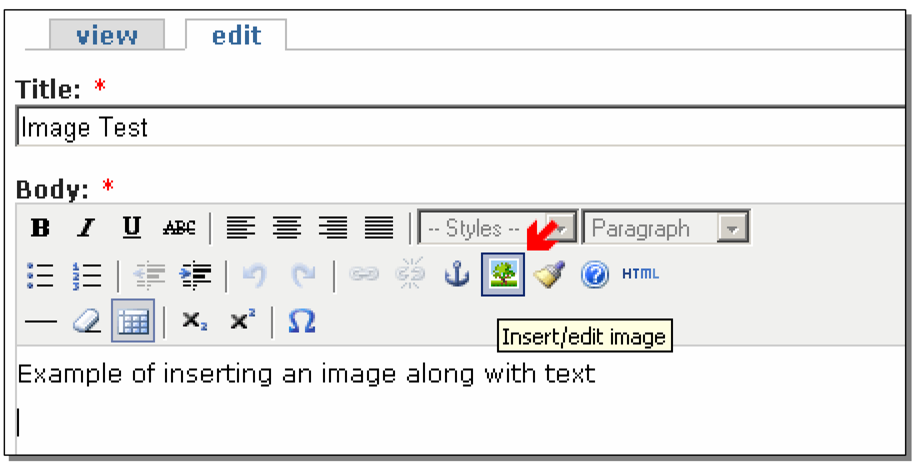


Remember to click Submit

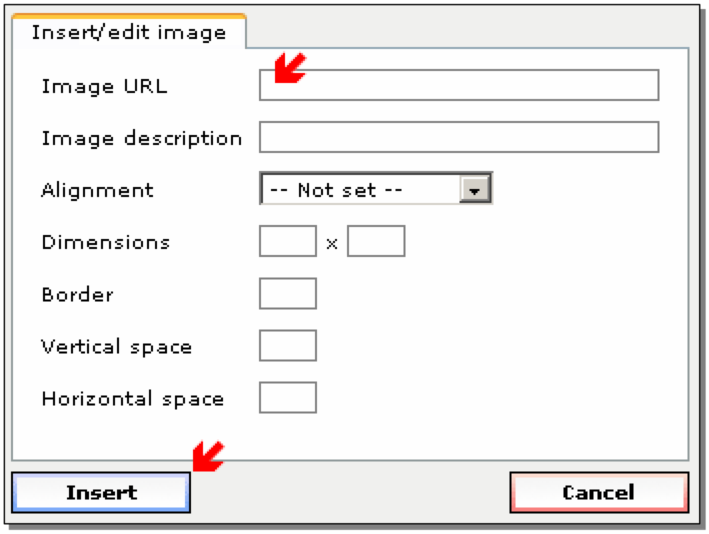
2.3.2.2.6 Inserting Images

To display an image, you will need to first attach the image file as described in the **Posting Files** section above and Submit the changes. When you have attached the file and Submitted the changes, return to the edit tab and you may then insert the file into the body of your text. You will need to look at the url text listed below the file description of the desired file. It will begin with http://www.hidcc1.org/files/. Copy this string, you will need to enter this text later.

After positioning the text cursor within the body text where you would like the image to be displayed, click the Insert/edit image button in the toolbar above to bring up the image properties dialog box.



In the 'Image URL' box, paste the exact text described above, then click 'Insert'.



You should now see the image displayed inline with the body text.

This task will extend into 2007 with the primary work being associated with providing a internet based data entry system for the field demonstration projects and the linking of the district's water ordering/account database with the real-time on-farm flow measurement telemetry system.

2.4 On-Farm Demonstration of Surge and Center Pivot Irrigation Systems

2.4.1 Task 4 Description

The Subcontractor shall provide technical assistance to the District, as requested in writing by the District, in the design and specification of any surge or center pivot irrigation systems used for demonstration projects and assist the District in developing the type of data and methods of data collection need for determining the irrigation efficiency and other water use data of the demonstration project.

2.4.2 Work Completed

No requests for support have been made other than attending technical meetings and advising on the need for detailed specifications for data collection.

2.5 Variable Speed Pump Control and Optimization of Delivery of On-Farm Demands

2.5.1 Task 4 Description

The Subcontractor will provide assistance to Delta Lake Irrigation District (DLID) in the design, implementation, and purchase of the pump controller/PLC to use with DLID pump equipment to demonstrate the use of internal combustion engines in matching the quantity of water diverted from the district canal for meeting irrigation demands. A technical workshop and the associated training materials will be prepared for training district managers in the proper design, installation, and cost of installing and operating variable speed drives, and the associated pumping and pipeline systems.

2.5.2 Work Completed

Work in 2006 primarily consisted of prepartion and giving of a training course on variable speed pumping plants and hydraulic modeling. This course was giving in March of 2006. Training manuals, software, and course review forms are available from the district. The SCADA PLC control specifications were developed for a diesel powered pumping plant and two locations were evaulated for the demonstration project. Delta Lake Irrigation District relift station 45 and HIDCC's Flow Measurement Calbration Facilities Rio Grande Lift pump # 7.

The project will continue in 2007 with the installation of the PLC at one or more sites and the addition of the site to the field demonstration day.

3. Project Task Budget

Table 3.1 indicates the budget and expenditures for each of the four tasks discussed. 58% of the budget has been expended with approximately the same amount of task work being completed.

Table 3.1: Project Task Budget

Task Budget March 1, 2006 through February 28, 2007 (4th Quarter Expenses)

	Task Budget	Expenses This Period	Previous Expenses	Accumulated Expenses	Balance Remaining	Percent Remaining
Task 1 Administration/Contracts	$ 5,020.00	$ 1,200.00	$ 190.00	$ 1,390.00	$ 3,630.00	72%
Task 2 Calibration Facility	$ 20,000.00	$ 1,365.00	$ 11,495.69	$ 12,860.69	$ 7,139.31	36%
Task 3 Internet User Info	$ 144,600.00	$ 5,032.50	$ 67,737.67	$ 72,770.17	$ 71,829.83	50%
Task 4 Technical Support	$ 4,800.00	$ -	$ -	$ -	$ 4,800.00	100%
Task 5 Variable Speed Pump	$ 45,800.00	$ -	$ 9,080.93	$ 9,080.93	$ 36,719.07	80%
Total	$ 220,220.00	$ 7,597.50	$ 88,504.29	$ 96,101.79	$ 124,118.21	56%

Expense Budget	Total Budget	Expenses This Period	Previous Total Expenses	Total Expenses Incurred	Balance Remaining	Percent Remaining
Salary and Wages [1]	$ 205,420.00	$ 7,097.50	$ 85,686.23	$ 92,783.73	$ 112,636.27	55%
Fringe[2] (20% of Salary)		$ -	$ -	$ -	$ -	
Travel (estimated)	$ 5,000.00	$ 500.00	$ 2,656.05	$ 3,156.05	$ 1,843.95	37%
Expendable Supplies (estimated)	$ 1,800.00	$ -	$ -	$ -	$ 1,800.00	100%
Capital Equipment		$ -	$ -	$ -	$ -	
Subcontracting Services	$ 8,000.00	$ -	$ -	$ -	$ 8,000.00	100%
Technical/Computer		$ -	$ -	$ -	$ -	0%
Reproduction	$ -	$ -	$ 162.01	$ 162.01	$ (162.01)	0%
Overhead		$ -	$ -	$ -	$ -	0%
Profit		$ -	$ -	$ -	$ -	0%
Profit					$ -	0%
Total	$ 220,220.00	$ 7,597.50	$ 88,504.29	$ 96,101.79	$ 124,118.21	56%

*amends quarterly reports. February. 2006 expense were accidentally included in the quarterly reports for the March 2006 through February 2007 time period.