

4.4 Furrow Dikes

Applicability

This Best Management Practice is intended for use by agricultural producers who plant row crops and is used to reduce water runoff from the furrows.

Description

Furrow dikes are small earthen dams formed periodically between furrow ridges. Furrow dikes reduce runoff from the soil surface and increase infiltration of rain or applied irrigation water. Furrow dikes can be used on gently sloping land in arid and semiarid areas.

Implementation

Furrow dikes should be utilized in fields with row crops to capture rainfall, reduce runoff from fields, and improve application uniformity in low pressure sprinkler systems.

Scope and Schedule

Furrow dikes are installed using a tractor-drawn implement often only in the non-wheel traffic rows and can be used in several agricultural practices:

1. In conjunction with conservation tillage, furrow dikes are installed in rows when the crop bedding is prepared to facilitate capture of rainwater or water from pre-plant low-pressure sprinkler irrigation and may remain in place during the entire growing season.
2. In conjunction with conventional tillage, furrow dikes can be installed after the crop bed is prepared and prior to planting or after a crop is planted and prior to the crop height being such that the installation would damage the crop. The dikes may be removed prior to and replaced after mechanical cultivation of weeds.
3. Furrow dikes may also be removed when additional moisture from rainfall would be detrimental to production or harvest of the crop.

Furrow dikes are typically first installed in non-wheel traffic rows at the time the crop bedding is prepared and reinstalled or maintained as necessary during portions of the crop growing season with high irrigation demand or high probability of rainfall.

Measuring Implementation and Determining Water Savings

To document this Best Management Practice, the agricultural water user shall document and maintain one or more of the following:

1. Photographs of the furrow dikes installed;
2. Any U.S. Department of Agriculture Farm Service Agency or other governmental agency evaluation and assistance reports that may relate to the project; or
3. Water measurement records from both the periods before and after installation of furrow dikes.

The amount of water conserved using furrow dikes is difficult to estimate and is dependent on when the furrow dikes are installed, the amount and intensity of rainfall, the infiltration rate of the soil, the slope of the furrow, and the application rate of the sprinkler irrigation system. Installation of furrow dikes in a row crop field can eliminate runoff, thereby increasing the effectiveness of water applied using sprinkler irrigation.

Cost-Effectiveness Considerations

The cost for purchasing or constructing a furrow diking implement ranges from less than \$2,000 to several thousand dollars. Cost estimates per crop season per acre range from \$5 to \$30 per acre. The quantity of water saved by installation of furrow dikes varies from field to field and season to season, but a conservative estimate would be three inches per season (0.25 acre-feet per acre).

References for Additional Information

1. *The Impact of Furrow Dike, Terracing, and Contour Cultivation on Water Conservation in Texas Agriculture*, Tucker, Kevin and Sam Feagley, 1998.
2. *Water management studies in the Rolling Plains*, TAES, B-1321. 19 p., Gerard, C.J., D.G. Bordovsky, and L.E. Clark, 1980.
3. *Furrow diking to conserve moisture*, J. of Soil Water Cons. 44: 271-273. Harris, B.L., and J.H. Krishna, 1989.
4. *Off-Season Manager Tips Pre-Plant Irrigation Management*, S5-02/03, Texas Agricultural Extension Service, 5 p., Porter, Dana, 2003.

Determination of the Impact on Other Resources

In addition to water savings, installation of furrow dikes can drastically reduce or even eliminate runoff from fields, thereby reducing the potential for nutrients and organics to enter surface water.