

3.1 Crop Residue Management and Conservation Tillage

Applicability

This best management practice is applicable to irrigated crops and most agricultural producers using irrigation water. Conservation tillage in general is applicable to both irrigated and dryland farming and can be used to preserve soil moisture in areas where there is significant precipitation to allow conversion of irrigated land to dryland farming.

Description

This best management practice includes tillage methods such as no till, strip till, mulch till, and ridge till. Residue management and conservation tillage allow for the management of the amount, orientation and distribution of crop and other plant residue on the soil surface year-round on crops grown where the entire field surface is tilled prior to planting. Conservation tillage improves the ability of the soil to hold moisture, reduces the amount of water that runs off the field, and reduces evaporation of water from the soil surface.

Implementation

The number, sequence, and timing of tillage and planting operations and the selection of ground-engaging components should be managed to achieve the planned amount, distribution and orientation of the residue after planting or at other essential time periods. Loose residue should be uniformly distributed on the soil surface. Tillage implements should be equipped to operate through plant residues to maintain residue on or near the soil surface by undercutting or mixing. Planting devices should be equipped to plant in the distributed residue on the soil surface or mixed in the tillage layer.

For furrow irrigation, crop residue in furrows can impede the flow of water down the field and cause problems with irrigation uniformity and application efficiency. Conservation tillage is more appropriate with some types of irrigation systems than others. For example, conservation tillage works well with low-pressure center pivot irrigation and subsurface drip irrigation.

Scope and Schedule

Residue management and conservation tillage may be practiced continuously throughout the crop sequence or may be managed as part of a residue management system that includes other tillage methods such as no till.

Measuring Implementation and Determining Water Savings

Establishment and operation of this practice shall be prepared for each field and recorded using jobs sheet, narrative statements in the conservation plan, or other acceptable documentation.

The amount of water saved by conservation tillage will vary by climate and irrigation method. Increased spring soil moisture content resulting from conservation tillage may allow a farmer to conserve one or more irrigation applications per year (typically 0.25 to 0.50 acre-feet per acre).

Reduction in soil moisture loss during the irrigation season may save an additional 0.5 acre-foot per acre.

Cost-Effectiveness Considerations

The cost of conservation tillage depends on the type of field operation used to manage crop residues. Some conservation tillage programs are less expensive than conventional tillage.

Determination of the Impact on Other Resources

The benefits of this practice are significant. Soil slowly but steadily improves when erosion is reduced and organic matter increases. The soil texture improves and crop productivity increases as the constant supply of organic material left on the soil surface is decomposed by a healthy population of earth worms and other organisms.

As with all practices that save water, energy is also conserved.

References for Additional Information

- 1) *Conservation Practice Standard for Residue and Tillage Management, No Till/Strip Till/Direct Seed (Acre), Code 329*, Natural Resources Conservation Service, March 2011.
- 2) *Conservation Practice Standard for Residue and Tillage Management, Mulch Till (Acre), Code 345*, Natural Resources Conservation Service, March 2011.
- 3) *Conservation Practice Standard for Residue and Tillage Management, Ridge Till (Acre), Code 346*, Natural Resources Conservation Service, April 2011.
- 4) *Conservation Practice Standard for Residue Management, Seasonal (Acre), Code 344*, Natural Resources Conservation Service, July 2011.

Acknowledgments-None