

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #1 - Reduced Till, basic

Scenario Description:

Reduced Till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting. This practice includes tillage methods commonly referred to as reduced tillage, mulch tillage, or chiseling and disking. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops, planted crops, and for planting perennial crops. All residue shall be distributed uniformly on the soil surface throughout the critical wind erosion period. All residue shall be uniformly distributed over the entire field and not burned or removed. During these periods, intensive tillage has led to excessive soil loss, often above the Soil Loss Tolerance (T), due to the loss of critical crop or weed residue. The RUSLE2 model will be used to review the farming operation and determine if enough residue is being retained throughout the rotation to keep soil loss below T. The producer will then remove operations, or select alternate operations, to reduce erosion below T as needed.

Before Situation:

Row crops such as corn, soybeans, etc. are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average are 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

Mulch tillage applies to all cropland and other lands where crops are planned. It applies to stubble mulching on summer fallowed land and to tillage for annually and perennial planted crops. It also includes some planting operations such as utilizing a hoe drill, air seeder and no-till drill that disturb a large percentage of soil surface during the planting operation. Tillage occurs after crop harvest. In warmer areas, weeds or cover crops grow throughout the winter months. The residue that remains on the soil surface provides soil cover during late fall, through winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. Wind erosion is reduced by standing residues. Winter weeds or the cover crop is terminated with tillage, a roller-crimper, shredding, or a combination of these methods prior to spring planting as late as feasible. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 100

Scenario Cost: \$1,981.00

Scenario Cost/Unit: \$19.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acre	\$18.58	50	\$929.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$21.04	50	\$1,052.00