

Tillage Practice Guide

A Guide to USDA-NRCS Practice Standards
329 No Till/Strip Till/Direct Seed and 345 Mulch Till

Practice Standard 329 – NoTill/Strip Till/Direct Seed

No Till
STIR Value* < 10



No-Till Planter



85% Soil
Undisturbed

15% Soil
Disturbed

1 PASS
Strip Till or
(Zone-Till)
Fall or Spring
STIR Value* 10-15



Zone-Till Planter



70% Soil
Undisturbed

30% Soil
Disturbed

2 PASS
Strip Till or
(Zone-Till)
Fall or Spring
STIR Value* 10-15



First pass make strips



Second pass plants

Zone-Till Planter

Practice Standard 345 – Mulch Till

Mulch Till
STIR Value* 15-30

Examples of full width
tillage implements.
Allowed for Mulch
Till Practice Standard.



* **STIR-Value:** Soil Tillage Intensity Rating which is a factor from RUSLE2 (Revised Universal Soil Loss Equation, 2nd version)

No-Till Planting

Leaves the soil and crop residue undisturbed except for crop row where the seed is placed in the soil. No Till planters disturb less than 15% of the row width. This disturbance includes soil moved in the crop row plus soil dispersed or splashed. The STIR value in a No Till system does not exceed a value of 10 in any year of the rotation. Full benefits from a No Till system are accomplished after five continuous years of this practice.

Advantages: Maximum erosion control, conserves soil moisture, improve soil organic matter, lowest fuel and labor input costs

Management Challenges: Limited nutrient incorporation may increase dependence on herbicides, soil warming may be slower in the spring especially on poorly drained soils with heavy residue levels.

Zone-Till (Strip-Tillage)

Coulters and/or row cleaners till up to 30% of the row width leaving the remaining 70% between the rows undisturbed. The STIR value in a Zone Till system does not exceed a value of 15 in any year of the rotation. Zone Tillage may involve making strips in fall or spring prior to planting.

Advantages: Excellent erosion control, conserves soil moisture, allows soil warming in the row, allows in row incorporation, reduced fuel and labor costs and allows banding of P and K.

Management Challenges: May increase dependence on herbicides

Mulch Till (Full Width Tillage)

Chisel plow or secondary tillage equipment such as field cultivator or disks are used to till prior to planting. While some residue remains on the soil surface, disturbance occurs to more than 30% of the soil surface on the field. STIR value exceeds 15 and is less than 30. Aerways, rotary harrows and turbo tills are examples of full width tillage.

Advantages: Allows incorporation, moderate erosion control, will conserve some soil moisture when residue levels are high.

Management Challenges: Moderate erosion control especially if contour planting is not used, moderate soil moisture loss, moderate labor and fuel costs

Additional Considerations: Fertilizer applications (manure and other fertilizer) may fall within the No-till or Strip-till standard based on the STIR value calculated for the type of injection system used.

Manure Application

Tank w/ Manure Injector



Dragline Manure Injector



Manure may be injected or worked into the fields. The manure application must be factored into the management operations in RUSLE2 to reflect correct STIR value.

Fertilizer Application

Anhydrous Injector



Fertilizer application is allowed, but must be considered as a tillage operation when establishing a STIR value.