USDA NRCS
U.S. Department of Agriculture
Natural Resources Conservation Service

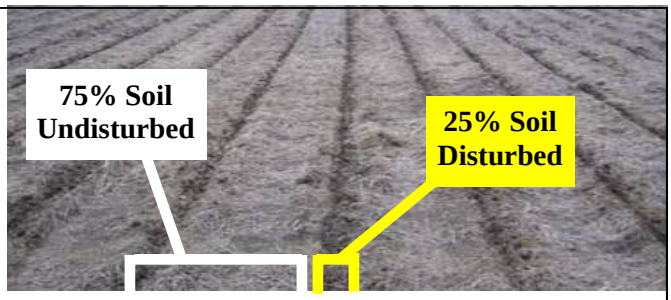
Tillage Practice Guide

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

Practice Standard 329 – NoTill/Strip Till/Direct Seed

No Till
Stir Value <10

No-Till Planter



1 Pass
Strip Till or (Zone-Till)
Spring
Stir Value* 10-15

Zone-Till Planter- makes strips and plants in one pass.

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

Zone-Till Builder

First pass make strips

Second pass plants

Zone-Till Planter

Practice Standard 345—Mulch Till

Mulch Till
Stir Value* >15

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

This practice leaves the soil and crop residue undisturbed except for crop row where the seed and fertilizer is placed in the ground. No Till planters disturb less than 25% of the row width. This disturbance includes soil moved in the crop row plus soil dispersed or splashed. Weeds are controlled primarily with herbicides. Row cultivation is not done except in emergency situations. The STIR value in a NT system does not exceed a value of 10 in any year of the rotation. If no till is only done for some years of the rotation, the STIR value does not exceed a value of 10 for the year that no till is practiced. Full benefits from a NT system are accomplished after five continuous years of this practice.

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

Management Challenges: Limited incorporation potential, 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 ST system does not exceed a value of 15 in any year of the rotation. 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, low 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. Aerways, rotary harrows and turbo tills are examples of full width tillage.

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

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

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. Manure injector, liquid, low disturbance, can be part of a strip till system.

Fertilizer Application

Anhydrous Injector

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