

Maryland Tillage Practice Guide

This guide is designed to provide conservation planners with a quick reference for NRCS Residue and Tillage Management Practices — No-Till/Strip-Till/Direct-Seed (Code 329), Mulch-Till (Code 345), and Residue Mgt.-Seasonal (Code 344).

Practice Standard 329 — Residue & Tillage Management, No-Till/Strip-Till

<p>No-Till Stir Value* <10</p> <p><i>No-Till Planter.</i></p>		 <p>85% Soil Undisturbed</p> <p>15% Soil Disturbed</p>
<p>1 Pass Strip-Till or Zone-Till Stir Value* 10-15</p> <p><i>Zone-Till Planter makes narrow strips and plants in one pass.</i></p>		 <p>75% Soil Undisturbed</p> <p>25% Soil Disturbed</p>
<p>1 Pass Vertical-Till or Turbo-Till High residue crop STIR Value* <30</p> <p><i>Turbo-Tiller.</i></p>		 <p>Minimally disturbed plant residue</p>

This practice leaves the soil and crop residue mostly undisturbed except where seed and fertilizer are placed in the ground. Disturbance may include soil moved in the crop row plus soil dispersed or splashed. Approved implements include no-till and strip-till planters; drills and air seeders; strip-type fertilizer and manure injectors and vertical tillage or other similar implements that only minimally disturb residue from previous crops. Implements that result in significant disturbance cannot be used in this system. Weeds are controlled primarily with herbicides. Row cultivation is not used except in emergency situations.

In order for this practice to be applicable, the criteria must be met for all crops in the cropping system. The STIR value in a no-till system cannot exceed a value of 10 in any year of the rotation. Full benefits from no-till are accomplished after five continuous years of this practice. In a strip-till system, the STIR value cannot exceed a value of 15 in any year of the rotation. If vertical tillage is used to chop stalks or minimally incorporate manure with surface residue, the STIR value cannot exceed 30, only one pass can be made in the field, and only on a high residue crop.

Advantages: Provides maximum erosion control, conserves soil moisture, improves soil organic matter, sequesters carbon, has lowest fuel and labor input costs.

Management Challenges: May limit the incorporation of nutrients and other soil amendments, may increase dependence on herbicides, and may slow soil warming in the Spring, especially on poorly-drained soils with heavy residue levels.

* **STIR Value:** “Soil Tillage Intensity Rating,” which is a factor from RUSLE2 (Revised Universal Soil Loss Equation, 2nd version). STIR values provide relative measures of the amount of soil disturbance when comparing different tillage systems. A low STIR value (e.g., less than 30) indicates minimal soil disturbance, which is desirable for soil quality and erosion control. A high STIR value (e.g., more than 70) indicates significant disturbance.

Practice Standard 345 — Residue & Tillage Management, Mulch-Till

Mulch-Till

Stir Value

<70 high residue crops

<10 low residue crops

Examples of full width tillage implements.



A chisel plow or secondary tillage equipment such as a disk, field cultivator or harrow is used to till the soil and prepare a seedbed before planting. The entire field is disturbed with tillage, although some residue remains on the soil surface. For high-residue crops (such as grain corn), the STIR value shall not exceed 70. For low residue crops (such as grain soybeans), the STIR value shall not exceed 10. These STIR values will result in approximately 30% or more surface residue for each crop in the entire rotation.

Advantages: Provides moderate erosion control, conserves some soil moisture, improves organic matter when high-residue crops are used, and allows incorporation of nutrients and other soil amendments before planting.

Management Challenges: Moderate erosion may occur on steep slopes if contour planting or other erosion control practices are not implemented. Soil moisture losses and fuel and labor costs will be higher than with no-till/strip-till systems.

Practice Standard 344—Residue Management, Seasonal

Residue Management- Seasonal

Retaining annual crop residue from harvest until another crop is planted.



Some or all crops in the rotation are established using conventional tillage methods, but crop residues are left on the soil surface during a specified period, typically during the winter months. This practice is applicable when residue and tillage levels do not meet the requirements for No-Till/Strip-Till (Code 329) or Mulch-Till (Code 345). Code 344 should not be planned as a separate practice on fields where Code 329 or Code 345 will be used. Seasonal residue management is already included as a component of No-Till/Strip-Till and Mulch-Till practices.

Advantages: Provides erosion control between harvest and planting, conserves some soil moisture, improves organic matter if residue levels are high, and allows incorporation of nutrients and other soil amendments before planting.

Management Challenges: Moderate to significant erosion may occur on steep slopes when residue is not present, necessitating the use of additional practices for erosion control. Soil moisture losses and fuel and labor costs will be higher than with no-till/strip-till or mulch-till systems.