

Natural Resources Conservation Service

**Supplement to Conservation Practice Standard
Residue and Tillage Management Mulch Till
(Acre)
Code 345**

This supplement contains clarification of criteria for planning and certifying residue and tillage management mulch till.

1. Definition in the standard reads: Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year round while limiting soil disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting.
 - Interpretation: This is a year-round system used to manage residue. This means that all crops in the crop rotation for a whole year need to be considered, not just the major crop or cash crop, and includes cover crops also. An example of this crop rotation would be a cover crop of rye planted in November and cotton planted in April and harvested in early November. The second year of the crop rotation would then start with a cover crop of rye planted in November.
 - This standard allows the entire field surface to be tilled prior to planting, so full-width tillage is allowed.
2. Conditions where this practice applies: This practice includes tillage methods commonly referred to as mulch tillage or chiseling and disking. It applies to mulching idle or fallow land, tillage of annually planted crops, and tillage for planting perennial crops. It also includes some planting operations, such as hoe drills, air seeders, and “no-till” drills that disturb a larger percentage of the soil surface than what is considered a slot or strip during the planting operation.
 - Interpretation: The list of implements that can be used with this practice include full-width tillage implements, such as disks and chisels, and planting implements, such as hoe drills that disturb more of the soil surface than just slots or strips.
3. A minimum of 30 percent of the soil surface shall be covered by plant residue immediately following the planting of the crop.
 - Interpretation: After the major crop is planted, a minimum of 30 percent of the soil surface needs to be covered by plant residue. Under this standard, the tillage operations prior to and during planting must not

reduce the plant residue on the soil surface below the 30 percent requirement. This percentage needs to be measured as outlined in the guidance document for the No-till/Strip-till practice. In addition to determining the plant residue amount at the time the cover crop is killed or harvested, plant residue after the major crop is harvested should also be measured to determine if a cover crop is necessary. The goal is to have 30 percent cover regardless of the residue source to protect the soil from water and wind erosion from the time the next major crop is planted until the crop has enough time to cover the soil surface with its canopy.

An example of this type of determination would be that at time of harvest of a corn crop the residue was measured and showed 80 percent. This should be adequate to provide the 30 percent needed at the time of planting of the next major crop, except the next crop is rye to be harvested for grain. To prepare for the rye crop, the field is disked twice and drilled. The residue budget shows that a disk will leave 40 to 70 percent of the residue after it goes through the field or an average about 50 percent. So, by multiplying 80 percent residue by 50 percent for the first disking and then again by 50 percent, the corn residue remaining after disking to prepare for the rye planting would only be 20 percent. Since the grain drill leaves only about 90 percent of what is present, the total corn residue remaining after the planting of the rye would be only 18 percent ($90\% \times 20\%$) which is less than the 30 percent needed.

Another example would be to leave the corn residue through the winter and then plant into the remaining residue in the spring. The budget would then be determined by multiply original 80 percent by 85 percent left after winter decomposition. This figure would then be multiplied by 50 percent due to a single disking. Finally, the remaining value would be reduced due to planting the rye with a planter with a double disc opener, which leaves only 90 percent of the residue present at use. This combination of operations leaves 31 percent ($80\% \times 85\% \times 50\% \times 90\%$), which meets the minimum residue criteria for the practice standard. But if two diskings were done ($80\% \times 85\% \times 50\% \times 50\% \times 90\%$), then the remaining residue would be only be 15 percent, and the criteria for the conservation practice standard would not be met.

In the jobsheet for this practice, Figure 2 Machinery Table, gives percentages of residue left after an operation has occurred and by type of residue, either fragile (like peanuts) or non-fragile (like corn). An additional document from Purdue, Estimating Corn and Soybean Residue Cover (<http://www.agry.purdue.edu/ext/pubs/AY-269-W.pdf>), shows percentages that result after several different operations. The amount of residue that the cover crop will provide also depends on if the cover crop is grazed and when it is grazed during its growth cycle. Grazing at the beginning of the growing period for a limited amount of time has less effect on residue amount than if a cover crop is grazed at the end of the growing period. Also, if the cover crop is harvested for grain and the straw

baled after the combining, greatly reduces the amount of residue left on the field.

When planning and certifying the Residue and Tillage Management Mulch Till Practice Standard (Code 345) all of the following criteria must be met:

1. Full-width tillage needs to be limited to maintain the 30 percent residue.
2. A minimum of 30 percent of the soil surface needs to be covered by plant residue immediately following the planting of the crop.