Residue and Tillage Management No Till/Strip Till/ Direct Seed

Florida Conservation Practice Standard 329 Guidance

Natural Resources Conservation Service (NRCS) **June 2007**

PURPOSE

The purpose of this guidance is to provide additional information for no till / strip till / direct seed as outlined in Florida NRCS Conservation Practice Standard, Code 329. However, direct seed is not generally practiced in Florida and therefore is not discussed in this guidance sheet.

No-Till

No-till is when the crop is planted in undisturbed soil, with at least 60 percent of the soil surface covered by crop residue immediately after planting. The soil is left undisturbed from harvest to planting except for nutrient injection and/or seeding of cover crops. See Florida NRCS Conservation Practice Standard, Cover Crop, Code 340 for further guidance.
Crop residue is left on the soil surface from the prior crop. It may be shredded in the fall, winter or spring prior to planting or may be left unshredded. If the current crop residue is to be used (harvested) or it is not adequate to provide the needed cover, a cover crop can be used to provide the needed cover.

The seedbed, usually 1 to 3 inches wide, is prepared by breaking the soil with a coulter, single chisel, or similar tool (see Fig. 1 and 2). Seedbed preparation and planting are done in one operation. Use herbicides to control weeds. Refer to Florida NRCS Coservation Practice Standard, Pest Management, Code 595.

No Till
STIR Value <10

Fig. 1. One type of no-till planter.

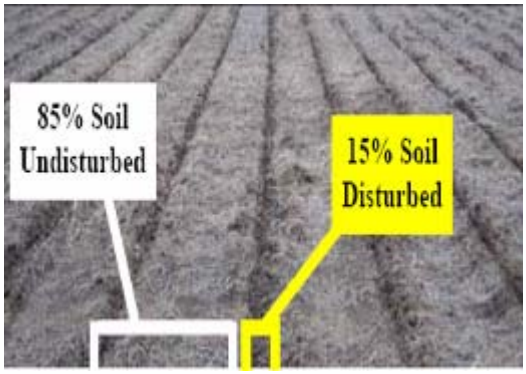


Fig. 2. Effect of no-till planter on the soil surface and proportion of disturbed to undisturbed area.

Strip-Till or Zone-Till

Strip-till or zone tillis when the crop is planted in a narrow, cultivated band, no more than one-third of the row width. The soil within the strips is disturbed by a planter that has been modified by adding multiple coulters and/or cleaners to remove more crop residue and create strips of bare or deep-tilled (using an in-row subsoil shank) soil. Generally, strip-till is not used when row spacing is less than 30 inches.

Either one- or two-pass types of equipment are used (see Figs. 3, 4, and 5). Regardless of the type of equipment used the field will have a minimum of 30 percent of the soil surface covered by crop residue immediately after planting (see Fig. 6).

Strip Till or Zone-Till (one or two pass)
STIR Value 10-15

Fig. 3. One-pass strip-till builder and planter

Fig. 4. Two-pass strip-till (or zone till) operation. In the first pass, the builder makes strips.

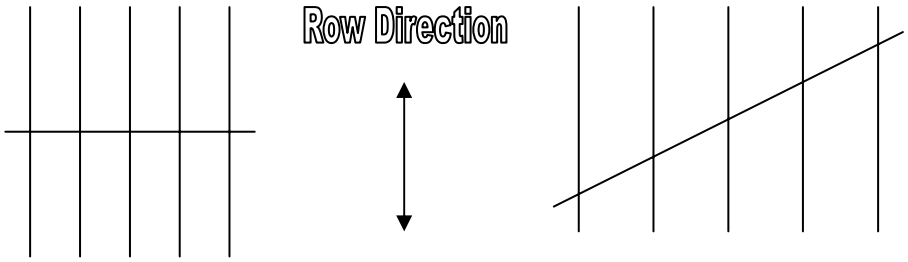
Fig. 5. In the second pass of a two-pass strip-till (or zone-till) operation, planting occurs.

Fig. 6. Effect of strip-till (or zone till) operation on soil surface and proportion of disturbed to undisturbed area.

ESTIMATING PERCENT GROUND COVER USING THE LINE TRANSECT METHOD

The line transect method has proven most effective in estimating the percent ground cover by plant residue. The following is the recommended procedure for using the line transect method.

- Use a commercially available 50 or 100 foot long cable, tape measure, or any other line that has 100 equally spaced beads, knots, or other gradations (marks) at which to sight.
- Select an area that is representative of the field as a whole and stretch the line out across the rows. The line may be oriented perpendicular to the rows or in a direction that is at least 45 degrees off the row direction.



- Walk along the line, stopping at each mark using the same edge of the line for all sightings. Looking straight down, determine whether a piece of residue is directly beneath the mark. Count the number of marks under which a piece of residue is seen that is large enough to intercept a raindrop. A rule of thumb is to count only residue which is 3/32 inch (roughly the size of a healthy wheat straw) in diameter or larger. Do not move the line while counting.

- When using a line with 100 marks, the percent residue cover is equal to the number of marks that had a piece of residue of the appropriate size underneath them. Double the number for a 50-foot line.
- Three to five transects should be done in each field, using the procedure described above. Five transects are recommended.

Crop residue measurement worksheet

(for use with the line transect method)

State _____	County_____	Tract_____
Land user _____	FSN _____	

Field no. _____ Planned residue level _____percent Residue type _____

Transect number	**Total number of points 1/**	**Number of points with residue 2/**	**Percent residue this transect**
Example	100	36	36%
1			
2			
3			
4			
5			
Average percent residue for field			

Field no. _____ Planned residue level _____percent Residue type _____

Transect number	**Total number of points 1/**	**Number of points with residue 2/**	**Percent residue this transect**
1			
2			
3			
4			
5			
Average percent residue for field			

1/ To achieve the degree of accuracy quoted in the NAM-recommended procedure for using the line transect method, each transect must be based on looking at a total of at least 100 points.

2/ Attach a map or sketch showing the location of each line transect within the field. All measurements shall be made using the line transect procedure contained in the National Agronomy Manual.

_____	_____	_____
Data Collector	Title	Date

ESTIMATING PERCENT GROUND COVER USING THE PHOTO COMPARISON METHOD

(NOTE: THIS METHOD PROVIDES A QUICK ESTIMATE, BUT IS LESS ACCURATE THAN THE LINE-TRANSECT AND SHOULD BE USED FOR GENERAL COMPARISONS ONLY)

10% corn residue This level of residue might be expected from a fall chisel with twisted points, a deep spring disking, a field cultivation, and planting.

20% corn residue This level of residue might be expected from a fall chisel with twisted points, one spring shallow disking, a field cultivation, and planting.

30% corn residue This level of reside might be expected from one fall chiseling with straight points, a shallow disking in the spring, a field cultivation, and planting.

40% corn residue This level of residue might be expected from a fall shallow disking, one spring field cultivation, and planting. Paraplowing in the fall followed by a spring field cultivation and planting are similar.

50% corn residue This level of residue will be difficult to reach without using a no-till system. One tillage system that could produce 50% ground cover after planting is to field cultivate twice in the spring and plant.

60% corn residue This level of residue might be expected from a no-till system where you plant directly into the existing residue. Another system is to field cultivate once in the spring and plant.

Soybean Residue

10% soybean residue This level of residue might be expected from a fall deep disking, spring field cultivation, and planting.

20% soybean residue This level of residue will be difficult to achieve with any fall tillage. This level could be achieved with an anhydrous application, a spring field cultivation, and planting.

30% soybean residue This level of residue might be expected from a spring field cultivation and planting.

40% soybean residue This level of residue might be expected from a well managed continuous no-till system.

Wheat Residue

10% wheat residue

15% wheat residue

20% wheat residue

30% wheat residue

40% wheat residue

50% wheat residue

60% wheat residue

70% wheat residue

References

Agronomy Guide. Purdue University Cooperative Extension Service No. AY-269.

U.S.D.A. Natural Resources Conservation Service. 2002. National Agronomy Manual. 190-V. 3rd ed.

U.S.D.A. Soil Conservation Service. January 1992. SCS-CRM-01.

U.S.D.A. Soil Conservation Service. April 1992. SCS-CRM-02.