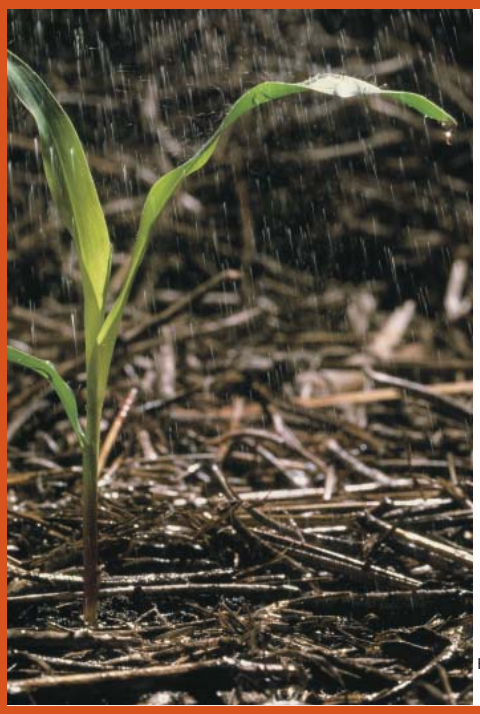

Farming with Crop Residues

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How to use the photos

Use these photographs of residue amounts to get a good picture in your mind of what the various percentages of ground cover might look like as you look down at evenly distributed residues.

The captions under each photograph with the asterisk (*) describe one of a number of tillage systems that would be expected to leave that percent residue cover. Use these examples and the "Guide to ground cover" only as a guide—residue levels can vary with tillage management techniques.

The person on the tractor seat is one of the keys to leaving heavy residues on the soil surface. Driving a little slower, tilling shallower, and correctly adjusting tillage equipment are ways you can make a difference.

For more ideas on farming with residues, see the section of this user guide titled "10 ways to leave more residue."

10%

This level of residue might be expected from a fall chisel with twisted shanks, a deep spring disking, a field cultivation, and planting. *

20%

This level of residue might be expected from a fall chisel with twisted shanks, a spring shallow disking, a field cultivation, and planting. *

30%

This level of residue might be expected from one fall chisel with straight shanks, a shallow disking in the spring, a field cultivation, and planting. *

40%

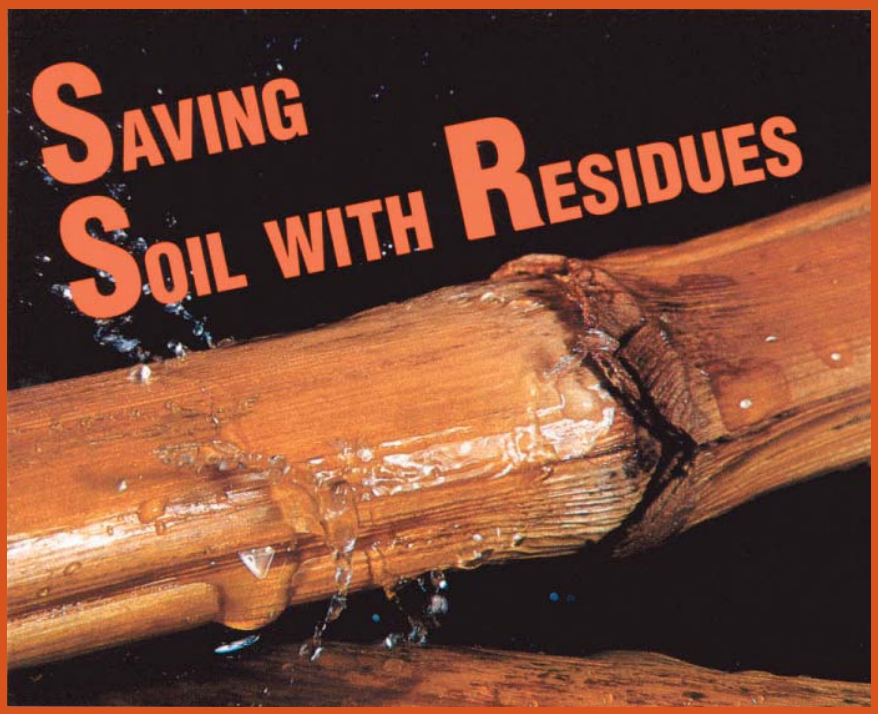
This level of residue might be expected from a fall shallow disking, one spring field cultivation, and planting. Paraplowing in the fall followed by a spring field cultivation and planting would be similar. *

50%

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

60%

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. *



Guide to estimated percentage of soil covered by crop residue after field operations. Predict the effect your till/plant system will have on crop residues by multiplying the percentages for each operation you use. These are broad ranges. Speed, depth, and soil moisture can affect the amount of residue left.

Tillage operation	Corn/Small Grain	Soybeans
After harvest	90-95	60-80
Over-winter decomposition	80-95	70-80
Moldboard plow	0-10	0 – 5
Paraplow	80-90	75-85
Combination secondary tillage tool	50-75	30-60
Chisel (twisted points)	50-70	30-40
Chisel (straight points)	60-80	40-60
Disk (off-set, primary >9" spacing)	40-70	25-40
Disk (tandem, finishing 7"-9" spacing)	30-60	20-40
Anhydrous applicator	75-85	45-70
Field cultivator (as secondary operation)	60-90	35-75
Row Planter	85-95	75-95
No-till drill	55-75	40-60

Here is an example of how to estimate how much residue cover will be left after each tillage operation.

95% {after corn harvest} x 90% {after winter} x 70% {spring chisel straight points} x 45% {spring disk tandem} x 85% {planting}

=23% {residue cover after planting}

10%

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

20%

This level of residue will be difficult to achieve with any fall tillage. A system which could produce 20% ground cover after planting, an anhydrous application, spring field cultivation, and planting. *

30%

This level of residue might be expected from a spring field cultivation and planting. *

40%

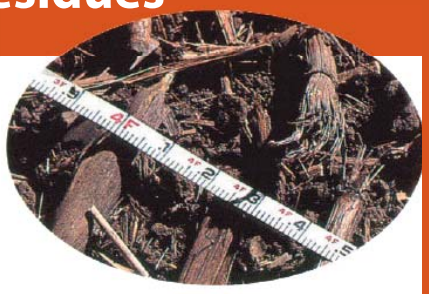
This level of residue might be expected from a well managed continuous no-till system. *

10 Ways to leave more residue

- Follow a crop rotation sequence with high residue producing crops. Soybeans don't provide the same kind of protection as corn, for example. Also, high yields give more residues.
- Wait until spring for tillage operations. This is most important on soybean ground. Fall tilled soybean ground is very vulnerable to wind erosion in late winter and early spring.
- Reduce the number of tillage passes. In most cases, this is as important as the type of tillage performed.
- Plant rye or wheat as winter cover crops. This is a good option when you are growing low-residue crops such as soybeans.
- Set chisels and disks to work shallower. Residues can be buried to the tillage depth.
- Stop using the moldboard plow.
- Drive slower on tillage operations. Driving faster throws more soil and covers more residue.
- Use straight shanks and sweeps on chisel plows instead of twisted shanks. Twisted shanks my bury 20 percent more residue.
- No-till drill soybeans instead of planting them conventionally. No-till drilling keeps more residue on the soil surface, and generally produces a quicker canopy.
- Convert to a no-till system. No-till disturbs residue only in the row.

How to measure residues

- Use any line that is equally divided into 100 parts. Fifty foot cable transect lines are available for this purpose. Another tool is a 50-foot nylon rope with 100 knots, six inches apart. A 50-foot tape measure using the 6-inch and foot marks also works well.
- Stretch the line diagonally across the rows. Count the number of marks (tabs or knots) that have residue under them when sighting from directly above one end of the mark. It is important to use the same point on each mark for accuracy. Don't count residue smaller than 1/8 inch in diameter.
- Walk the entire length of the rope or wire.



The total number of marks with residue under them is the percent cover under them is the percent cover for the field. If your rope or tape has only 50 marks, multiply by 2; for 25 marks, multiply by 4.

- Repeat the procedure at least 3 times in different areas of the field and average the findings.

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