

Agronomy Job Sheet



Photo courtesy of NRCS

What is Residue Management?

Residue Management is leaving last year's crop residue on the soil surface by limiting tillage. Includes no-till, strip-till, mulch-till and ridge-till.

How it Helps the Land

Crop residue management reduces soil erosion by wind and water. It helps to maintain or develop good soil tilth, adds organic matter to the soil as it decomposes, improves water infiltration and reduces evaporation from the soil surface. Less tillage reduces soil compaction.

Considerations

Crop selection, including variety will influence residue amounts produced. Higher plant population and narrower rows will increase residue distribution at harvest.

Planning for residue cover begins at harvest. Ensure the combine spreads ample residue evenly over the field. The amount of residue left on the surface determines the erosion reduction benefit.

Leave crop stubble as high as possible during harvest. Standing residue is most effective for reducing wind erosion.

Fragile residues (soybeans, sunflowers, sugar beets, etc.) are more easily destroyed with tillage.

Use straight points and sweeps on chisel plows instead of twisted points. Twisted points can bury 20% more residue.

Set tillage tools to work at shallower levels.

Reduce speed – slower tillage speed leaves more residue on the soil surface.

Implement dealers and manufacturers can provide information on how to adjust, modify and operate implements to leave more residue on the surface.

No Till and Strip Till

Crops are planted into crop residue that has not been tilled (no-till) or into narrow tilled strips that leave the rest of the field untilled (strip till).

Fertilizer can be applied either in the fall or in the spring, and can be either banded, broadcast or injected. Weeds are controlled before planting with burn down and pre-emerge herbicides. Cultivation can also be used as necessary.

Ridge-till

Crops are planted on ridges that are formed the year before. During the planting operation, crop residue is cleared from the row area and moved to the furrow between rows. The crop is planted in rows on a raised ridge. Fertilization and weed control are the same as for no-till. This system is limited to row crops.

Mulch-till

The entire soil surface is tilled, either in the fall or in the spring. Crop residue is partially incorporated, but enough remains on the soil surface to protect it from erosion. The amount of residue buried depends primarily on the type of machinery used, how it is used, and the type of residue it is used on. There are more options for weed control and fertilization with this system. There is also the possibility of destroying too much residue and increasing erosion.

Estimates of residue cover remaining after machinery operations.

Tillage operation	Corn/Small Grain	Soybeans
After harvest	.75 - .95	.65 - .80
Over winter decay	.80 - .95	.70 - .80
Moldboard Plow	.00 - .10	.00 - .05
Chisel – Sweeps*	.70 - .85	.50 - .60
Chisel – Straight Point*	.60 - .80	.40 - .60
Chisel-Twist Point*	.50 - .70	.30 - .40
Disk-Offset	.30 - .60	.20 - .40
Disk-Tandem(Primary.)	.70 - .80	.40 - .50
Disk-Tandem(Secndry.)	.30 - .60	.20 - .40
Field Cult. (Primary)	.35 - .70	.50 - .70
Field Cult (Secondary)	.70 - .80	.50 - .60
Soil Finisher	.50 - .70	.30 - .50
Harrows	.70 - .90	.60 - .80
Drills-Hoe	.50 - .80	.40 - .60
Drills – double disk	.80 - .95	.60 - .80
Drills – no-till	.75 - .95	.60 - .85
Planter-double disk	.85 - .95	.75 - .85
Planter-row cleaners	.60 - .80	.50 - .60
Planter-no-till coulter	.75 - .95	.70 - .90
Planter – wide fluted	.65 - .85	.55 - .80
Planter-ridge-till	.40 - .60	.20 - .40
Anhydrous Applicator	.75 - .85	.45 - .70

- - Reduce values by .05 - .10 when chisel is equipped with cutting coulters or disks.

Use this method to calculate your estimated residue cover:

After harvest x operation x operation x operation x operation x operation x operation = % cover remaining
 _____ x _____ x _____ x _____ x _____ x _____ = _____

Here is an example:

.95 (%after harvest) x .90 (over winter) x .60 (chisel – straight points) x .80 (field cultivate w/sweeps) x .90 (planting) = .37, or 37% ground cover remaining after planting. Check estimates by measuring residue.

This chart has been developed from research data. For each machine listed, the numbers are the ranges of crop residue expected to be left after one pass with that piece of equipment. The actual residue level can vary widely and should be measured. You should make some test passes, check residue cover, and make needed adjustments to equipment or operation, such as speed and depth. It is best to set equipment to work shallower, drive slower, and use tillage points that fracture the soil rather than turn or throw the soil.

These photos are examples of what various amounts of residue looks like.



Corn 25% residue



Corn 50% residue



Corn 75% residue



Soybeans 25% residue



Soybeans 50% residue



Soybeans 75% residue