

THE LEADING EDGE

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A PUBLICATION DEDICATED TO MAXIMIZING YIELD POTENTIAL

Clear the Path for Smooth Planting by Managing Residue This Fall

Producers' thoughts are likely turning toward getting through a late harvest. While it may be tempting to take shortcuts to get crops in, it's still a good idea to think ahead to planting. Growers who want good production levels next year know that now is the time to lay out the welcome mat for next spring's crop.



Uneven residue distribution can become an issue for next year's crop.

A successful planting season actually begins its life cycle at harvest. There are several issues that growers should keep in mind as they turn their combines into the fields. In particular, harvest is one of the best times to consider both the combine's effect on soil compaction, which is always a factor in spring planting success, and also residue management, a cycle that necessarily must begin in the fall.

Take precautions to limit compaction

As growers get ready to take their heaviest machines into the fields, they have good reason to be concerned about compacting the soil. Compacted soil has fewer pores and fewer natural water channels, which means that water tends to infiltrate the soil less. That often leads to greater surface water, increased runoff, more soil erosion, and a longer drying time in the spring. Once compacted, the soil can take 10 years to improve to its original condition.

To limit compaction:

- Watch axle loads and make sure the tires are properly inflated. Some producers are using tracks or duals for better floatation.
- When using a grain cart, try to use the same paths across the field and never cross it diagonally.
- Consider emptying the combine or the grain cart more frequently to limit weight.
- Move toward reduced tillage practices.
- Limit trips into wet fields helps. Soil is especially vulnerable to

compaction when it is heavily saturated in the 3- to 6-inch depth range.

Consider controlled traffic patterns

It also is wise for growers to be cautious about the trips through the fields with the heavy machines of the season—the combine, grain carts, and semi-trucks. Eighty percent of the soil compaction is created in the first pass, and up to 90 percent of the field may be tracked by equipment in one growing season (Figure 1).

For this reason some growers have started Controlled Traffic Farming (CTF) to designate certain paths in the field on which to operate machinery, year after year. If equipment is confined to the same wheel tracks for sequential passes, as little as 16 percent of the ground could be trafficked when running equipment 30 feet wide. And, these compacted areas have a benefit--this soil provides better flotation and improves traction in wet fields.

Switching to CTF is a transition that takes time. Producers will need to consider the tires on new, large equipment purchases--taller, narrower tires compact less surface area and are therefore preferred.

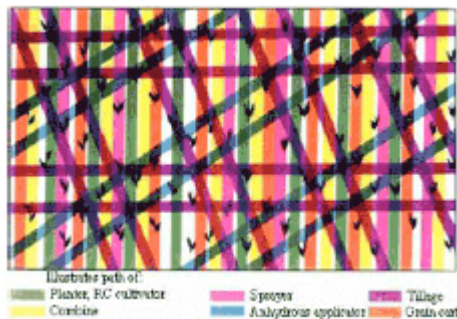


Figure 1. Field coverage by normal annual field operations.

Source: Management Strategies to Minimize and Reduce Soil Compaction.

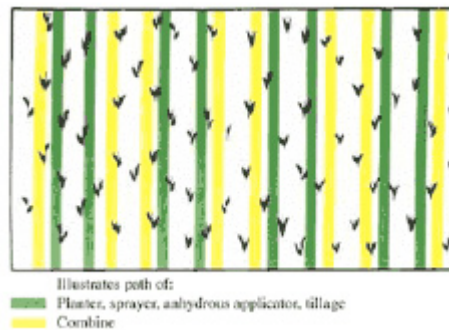


Figure 2. Field coverage in a controlled traffic situation.

Source: Management Strategies to Minimize and Reduce Soil Compaction.

Graph source: Jones, A.J., R.A. Wiese, E.C. Dickey. 1999. Management strategies to minimize and reduce soil compaction. University of Nebraska, G89-896-A.

The benefits and challenges of surface residue

The benefits of leaving residue on the ground over winter are many besides limiting compaction. By rebuilding organic matter, the quality of the soil improves, as does soil tilth. Soil structure improves as well, for several related reasons. The residue makes the soil less prone to crust, which leads to better water infiltration. At the same time, the residue catches more snow, also improving water infiltration.

Wind erosion is virtually eliminated, water erosion is significantly reduced, and weed growth may be limited as well.

That's not to say, of course, that leaving the residue is a carefree decision. If

the residue is too thick or not evenly spread, then that creates other problems for producers in the spring. Poor seed germination and related problems such as uneven emergence and thin crop stands could result. Cold soil or slow-drying soil are possible concerns as well.

Even residue spread is critical at harvest

While vertical tillage is an option some producers may want to consider, it may save a step to manage the residue from the beginning of harvest with the combine. Properly spreading out the residue with the combine saves both the time and expense of vertical tillage, but also limits trips back into the field that further compact the soil.

Properly sized residue keeps your equipment from plugging in the spring and reduces the workload for residue manager wheels that create a residue-free zone in front of the cutting coulter and knife.

As headers get wider, however, this becomes more challenging for producers. New, wide headers are often not equipped with spreaders or choppers capable of distributing residue across the swath.

Since soybean residue contains so much nitrogen, an even distribution of this residue across the header width is essential to avoid concentrating as much as 70 pounds of nitrogen in one band and leaving the next bare. Uneven nutrient supply will adversely affect next year's corn crop.

Banded residue also means covered areas will stay wet and cold in the spring while residue-free bands warm more quickly. These variances have a negative impact on yields and profits, especially for no-till producers using 30-foot headers.

For headers up to 25 feet, producers can try adjusting the deflector for each crop to get the most spread. However, investing in a chopper and spreader to attach to your combine will ensure the best residue management.

Tougher seeds, narrower rows mean heavier, tougher residue

Seed companies are engineering seeds that result in healthier, more tolerant corn plants with stronger stalks. After harvest, those stalks can become a real problem. In fact, experts estimate that a biotech hybrid that resulted in a yield of 200 bushels per acre also leaves an additional two to three tons of residue per acre compared to traditional varieties.



Heavy piles of residue make proper planter performance more difficult.

The fact that many corn producers are switching to 15-inch rows and corn-on-corn crop rotations only adds to the residue pile-up.

The answer to handle the blanket of residue that results is by encouraging decomposition over the winter months. Producers can achieve this by making

sure headers are set at an angle appropriate to lean the corn stalks over, opening up the root ball and placing stalks closer to the ground and therefore to earth worms and soil microbes.

Adapting or adding on aggressive knife rollers that are designed to crush corn stalks and open them to further decomposition is another option producers can consider.

Keep the combine on the straight and narrow

Finally, producers should not underestimate the importance of harvesting true to the rows. Technology offers a no-fail solution. Auto-steering systems can be upgraded with sensors and a software system. If the sensors brush against corn leaves, they communicate with the steering system and correct the combine's path automatically. This technology can provide a return-on-investment and reduce operator fatigue.

Begin preparations in the fall to welcome your seeds in the spring

Careful thought should be put in to limit, whenever possible, the negative effect that heavy harvesting equipment has on soil compaction and residue management. The best way to alleviate compaction is to eliminate, or at least minimize, the compaction in the first place. By controlling traffic patterns, compaction can be lowered immediately.

Harvest is also the time that reduced tillage operators should be taking steps to ensure that their soil will be ready to welcome next spring's seeding operations. Evenly spreading and chopping residue with the combine gives everyone a head start in the spring because no additional residue management passes are needed. Now is the time to start thinking about spring planting.

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