

# Removing No-Till Obstacles

**Residue managers should move trash so gauge wheels run level, drop seed consistently and produce uniform, high-yielding stands.**

*By Phil Needham,  
Contributing Editor*

**N**o-tilling corn and soybeans presents many challenges to producers across the country, especially within continuous corn and other high-residue environments.

Two strategies found to increase yields and profits in no-till include starter fertilizers and properly configured residue managers.

Starter fertilizers provide supplemental nutrition, which is important in early planted, cool no-till environments. Nutrients like nitrogen, phosphorus and zinc have all been found to improve early growth, shorten maturity and increase yields vs. untreated checks.

To help obtain a uniform seeding depth and a consistent standard of emergence across the field to take full advantage of starter fertilizers, I suggest that residue managers be fitted to no-till planters.

**1** Removal of residue from the seed zone improves seeding depth consistency. The image "Residue Interference" illustrates a field of soybeans that were no-tilled into 200-bushel-per-acre corn residue without the use of residue managers.

Notice the skip within the left row where the corn stalks were crisscrossed, causing gauge wheels to rise up and drop soybean seeds in dry soil at the soil surface.

With soybean seed nearing \$50 per 50-pound unit — more if treated with a seed treatment — seed needs to be placed at a consistent depth in the soil.

Properly configured and adjusted residue managers would have moved these stalks aside to help achieve more consistent seed placement depth.

**2** Residue managers lightly till the seed zone, which helps warm soils and increase nutrient avail-



**RESIDUE INTERFERENCE.** Without residue managers in high-yielding corn residue, skips occur (left row) when gauge wheels rise up and drop soybean seeds in dry soil at the soil surface.



**20-BUSHEL LOSSES.** Research from Minnesota indicates corn yields can be reduced more than 20 bushels per acre when a 7-day difference in emergence occurs. In this image, fixed residue managers did not consistently move residue out of the path of the planting unit.

ability. Research shows small increases in soil temperatures can have a significant impact on the availability of nutrients like phosphorus.

A properly adjusted residue manager often increases soil temperature at the

1-inch depth by 5 F to 8 F, compared to undisturbed soil and residue.

The image "20-Bushel Losses" illustrates a field of corn no-tilled into wheat stubble. Notice the difference in plant health and leaf stages between the

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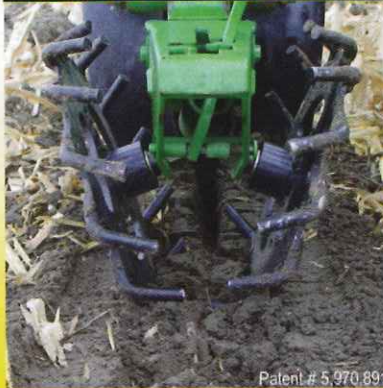
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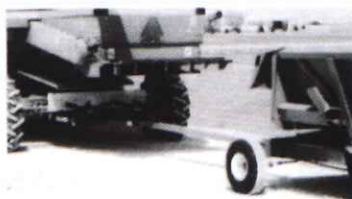
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cleared row (left) and uncleared row. Corn plant emergence varied from 1 to 2 leaf stages, all due to the difference in soil warming caused by residue movement variations.

Research from Minnesota (Ford and Hicks, 1992) indicates corn yields can be reduced more than 20 bushels per acre when a 7-day difference in emergence occurs. One reason for inconsistent residue movement was the installation of fixed residue managers.

**3** Residue managers create a more consistent surface to plant corn into, even with conventional tillage. Clods, rocks or heavy residue can cause the planter unit to bounce, which can have a negative effect on seed placement by causing the seed meter to drop seeds, resulting in costly skips or doubles.

Residue managers push obstacles aside, helping gauge wheels travel consistently across the soil surface. A good

**“Residue managers create a more consistent surface to plant corn into...”**

example of this can be seen in the image “Move Obstacles.”

This field had anhydrous ammonia applied prior to planting and the shanks kicked out occasional clods. The residue managers can be seen moving them clear of the gauge wheels to allow them to follow the soil surface more consistently.

## Floating Vs. Fixed Residue Managers

The first commercial residue managers introduced to help no-tillers plant through heavy residue were a fixed design. Fixed residue managers are devices that bolt in front of the row unit. (Some brands also use a screw-adjust system.) Vertical adjustment is achieved by removing a bolt or pin, or turning a screw to adjust the height of residue managers.

However, the challenge is that they cannot be adjusted enough in a pass to operate across a wide range of soils, topographies and residue levels. As a result, some residue managers skip over lower areas of soil or residue and dig too deep into raised areas of the field.

A secondary challenge associated with this digging is the gauge wheels will descend into the cleared area. Because the residue manager is positively attached to the planter unit, this causes the residue manager to dig deeper into the soil, at which point the gauge wheels descend more.

Hunting up and down is common in fields with inconsistent soils and soil moistures, especially when combined with significant topographical changes. The result is inconsistent residue clearing and poor emergence uniformity.

Most producers have now made the transition to floating residue managers. Floating residue managers are devices that have a pivot point, allowing them to float and follow the soil contours without influencing the planter's working depth.

Floating residue managers are designed to move residue



**MOVE OBSTACLES.** Residue managers push clods of dirt to the side so planter units do not bounce and drop seed at a poor depth.



**LESS DIGGING.** Floating residue managers equipped with side treader wheels improve the flotation of row cleaners and prevent digging of loose, dry soils.

and not soil. They are also designed to lightly till the seed zone, which results in uniform soil warming.

The image "Less Digging" illustrates floating residue managers equipped with side treader wheels. Side treader wheels greatly improve the flotation of the wheels and help

prevent digging of loose, dry soils.

Side treader wheels have also been found to increase the traction on residue manager wheels to keep them turning within heavy residue.

Field agronomist Ken Ferrie has realized increased performance of floating row cleaners in his field trials.

"Running row cleaners so they can float over the terrain improved yields compared to the same row cleaners pinned into a static position," Ferrie wrote in a February 2007 *Farm Journal* article. "In 2006, floating row cleaners added 10 to 13 bushels of yield in no-till fields. After closely watching these

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row cleaners run and monitoring yields for the last 3 years, I'm convinced that it's best to let row cleaners float and hug the ground in no-till fields."

The only conditions that present challenges to floating row cleaners include heavy residue, such as 180-plus-bushel-per-acre, poorly decomposed stalks. This may require the addition of wheel weights or down-pressure kits to floating residue managers.

Such additions help keep residue manager wheels engaged within the residue and keep the wheels turning at a constant speed. Both of these elements are important for uniform residue movement from the seed zone.

### No-Till Coulters

There has always been debate surrounding the topic of no-till coulters. Some producers say they must have no-till coulters to penetrate the soil and

residue. Meanwhile, other farmers in similar areas and crop rotations get along fine without them, having removed them or purchased planters without no-till coulters.

My recommendation is strongly dictated by the age and type of planter the no-tiller is using and the no-till planting conditions.

Many older planters, like the John Deere 7000 series, may not have sufficient weight, disc-opener thickness or unit rigidity to no-till successfully in hard soils without a coulters.

In contrast, many new planters come with 4-millimeter-thick, double-disc openers. Such disc openers are designed to penetrate hard soils without the need for a no-till coulters.

Many brands and models of planters can be upgraded with improvements.

It should be noted that some brands



**REPLACEMENT RULES.** When replacing no-till coulters, replace the double-disc openers, also. Otherwise, the coulters will run deeper than the double-disc openers.

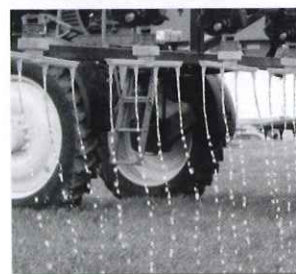
of planter don't allow the no-till coulters to be adjusted high enough in relation to the double disc openers. While this may not be a significant problem when



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the planter is new, this may present significant problems when the coulters wear and need to be replaced.

The image "Replacement Rules" illustrates a producer who replaced the no-till coulters but didn't replace the double-disc openers. This configuration causes the no-till coulters to run deeper than the double-disc openers.

Within many moist soils, this causes a false floor within the base of the seed slot and can frequently result in seeds falling deeper than the working depth of the double-disc openers.

Such differences can lead to uneven emergence, so be sure that discs are replaced together or that no-till coulters are adjusted or modified to run no deeper than the double-disc openers.

Generally, if you are no-tilling corn into soybean residue, no no-till coulters are required — especially if a residue manager is installed to move residue aside of the double-disc openers.

Some producers with older planters will state that they can't penetrate hard clay soils without a no-till coulters. My polite response is to ask them why they wait that long to plant corn. In my experience, most successful no-tillers plant corn earlier into moist soils.


I've seen numerous conditions where a no-till coulters was detrimental to the planter's performance, so growers need to be aware of these situations and be ready to remove the coulters.

Wavy coulters can frequently throw soil out of the seed zone. When this occurs, it does two things — which are both bad. First, as soil is thrown out of the seed zone and into the path of the

gauge wheels, the gauge wheels raise up, resulting in shallow seeding depths. Second, as a result of soil being thrown out of the seed zone, less soil is available to help close the seed slot.

One additional challenge with these conditions is that water may also stand within these depressed seed zones,

especially within poorly drained, flat fields. Therefore, watch the performance of no-till coulters closely and be ready to remove them.

It should also be noted that as the years of continuous no-till accumulate, many growers find looser soils allow them to remove coulters. 



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