No-till Forage Establishment: Tips for Success

Preprint version

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Various no-till seeding methods can be advantageous for farmers depending on their operation and goals. No-till seeding is preferred on sloping land where erosion potential is high and also when improved forages are being interseeded into established stands. Using the correct type of seeder and related practices for the job can improve efficiency and seed growth.

Suppress sod and reduce residue. Heavy residue can interfere with accurate seed placement and reduce soil to seed contact that is essential for germination. Sod suppression and residue reduction is best accomplished by close and hard grazing (overgrazing) prior to establishment.

Calibrate drill prior to seeding. Proper seeding rate is essential for establishing strong and vigorous stands of forage. Higher than recommended seeding rates needlessly increase seed cost and lower than recommended seeding rates result in thin stands that are less productive and more susceptible to weed encroachment. Actual seeding rates can vary greatly from seed charts found in drills. Always calibrate drills prior to establishment. See UK Cooperative Extension publication AGR-254: Grain Drill Calibration: Don't Make a Mistake Calibrate for details on calibrating no-till drills or review Dr. Chris Teutsch's tutorial Grain Drill Calibration on the UKForages YouTube Channel.

Adjust no-till coulter. The leading no-till coulter should be in alignment with the disk opener and set equal to or slightly deeper (1/2 inch) than desired seeding depth. Follow instructions in the drill manual for making depth adjustments.

Adjust seeding depth. Always check seeding depth. Seeding depth should never be deeper than ½ inch for most small-seeded forages. Seeding depths greater than ½ inch will result in poor emergence and uneven stands. Follow instructions in the drill manual for adjusting seeding depth.

Control post-seeding competition. If post-seeding competition from the existing sod is not controlled, stand failure is likely. Allowing animals to graze the pasture immediately following seeding is ideal. Livestock should be removed after seedlings have emerged and are tall enough to get grazed off. Pastures should then be rested until the existing sod has regrown enough to begin shading the new seedlings. At this point pastures should be flash grazed (large number of animals for a short period time) to a height of just above the new seedlings. This will keep the canopy open and allow light to reach the developing seedlings.

Understanding forage seeders

The type and size of seeders varies greatly. This article will outline the features of five different no-till seeders. Three of these are the conventional, furrow-cutting implements (Figure 1) that come in various widths from six to seven feet to more than 30 feet. One uses a spiked cylinder to disturb the soil ahead of a drop seeder instead of the cutting coulter/double disc opener systems of traditional drills. And one is a modified Brillion-type seeder.

Haybuster

The Haybuster (Figure 2) is unique among the traditional furrow-cutting no-till drills in that it does not have a cutting coulter ahead of the double-disk row openers where the seed is dropped into the furrow. Depth is controlled by varying the weight on the row openers by a hydraulic cylinder and by the amount of travel allowed in the press wheels. Steel 'donuts' or spacers can be placed on the piston shaft of the cylinder to provide consistent, limited down pressure on the row openers. Press wheels serve to ensure seed to soil contact behind the row openers. The up-down travel of the press wheels can be adjusted to help the row openers 'float' and stay at a consistent depth. Haybuster drills have removable panels over the seed path that keep it clear of debris and help with clean-out. These drills also have sliding plates at the bottom of the seed boxes that greatly aid in clean-out when planting is done. Haybuster drills have a 'tricycle' tire arrangement, one in front and two behind, which makes it easier to transport on narrow roads.

Truax

Truax drills have a front cutting coulter ahead of the row openers, and press wheels firm the seed into the soil. Depth is controlled by depth bands on the row openers and by a hydraulic cylinder which can limit the down pressure on the row openers. These drills are known for their specialized seed box that is designed to handle the fluffy seed of native grasses. These drills have boxes that can also handle cool season grass or legume seed.

Great Plains

Great Plains drills (Figure 2) also have a front cutting coulter ahead of the double-disk row openers. Depth is controlled by adjusting the depth of the front cutting coulter as well as the up-down movement of the following press wheels. The seeding mechanism is driven by end wheels and can be disengaged for calibration or transport.

Woods Seeders

The Woods seeder (Figure 3) is an example of a different mechanism than those of the traditional furrow – cutting drills like the Haybuster, Truax or Great Plains. These seeders are not 'drills' as their seeding mechanism simply drops seed onto soil that has been disturbed by spiked cylinders or disks at the front of the implement. The angle of the front cylinder or disk (depending on model) can be adjusted to alter the amount of disturbance ahead of the seed drop zone. A corrugated roller at the rear firms the seed into the ground. These three point hitch seeders vary in width from 49 to 84 inches. A calibration tray and crank handle are integrated onto the implement to facilitate calibration. The ground-driven seeding mechanism can be disconnected for either calibration or when using the implement only for soil disturbance or tillage.

Brillion 'Till N Seed'

This ground driven seeder is a one-pass tillage and seeding implement that disturbs the soil by a rotating disk. Seed is distributed onto the soil as it is being disturbed by the rotors. A heavy, corrugated roller then firms the seedbed, ensuring seed-soil contact. These seeders have a built-in, full width calibration tray that is stored on the implement when not in use. Depth and down pressure on the tilling rotors is adjustable. These implements come in pull behind or three point hitch models. These drills provide excellent depth control and are most effective in dry conditions.

No-till Seeder Summary

When using any equipment, be sure to read and understand the manual and follow its guidelines. Always clean out seed boxes and tubes before and after each use. And for rental equipment, never assume the person who had it before you had it set right!

Figure 1. Traditional, furrow-cutting no-till drills are designed to place the desired amount of seed at recommended depths and firm the seed into the furrow with press wheels. When using any equipment, be sure to read and understand the manual and follow its guidelines for maximum success.

Figure 2. The seeding mechanisms of the Haybuster (lf) and Great Plains (rt) drills. In the Haybuster, the double disks of the row openers are offset so the leading disk can cut through crop residue. The Great Plains uses a separate front coulter to cut through crop residue. The rear press wheels help control depth by limiting the penetration of the row openers where the seed is dispersed.

Figure 3. Smaller three-point hitch seeders like this Woods use spiked cylinders or disks (model not shown) to disturb soil ahead of the seeding mechanism. Corrugated rollers in the rear firm the seedbed and help ensure good seed soil contact.

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