Don't Let The Planter Hold Back Your Corn Yields

R.L. (Bob) Nielsen , Agronomy Department , Purdue University, West Lafayette, IN 47907-1150

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- Uneven stands easily reduce corn yields 7 to 15 bu/ac
- Planter malfunction is a common cause of uneven stands
- Planter maintenance and adjustment worth the cost

Uneven stand establishment in corn consists of uneven seed spacing, uneven emergence, and/or uneven seedling growth. Yield losses associated with uneven stand establishment in corn can easily approach 7 to 15 bu/ac. Luckily, the most frequent culprit that causes uneven stands in corn is the planter itself. I say luckily because timely planter maintenance and adjustments are easily improved at rather minimal cost to the grower. This article describes the common causes of uneven stand establishment as well as tips to ensure uniform stand establishment.

Causes of Plant Spacing Variability.

Plant spacing variability is typically related to misadjusted or malfunctioning planter mechanisms. With Deere-type planters, double or triple seed drops may occur from worn finger-pickup mechanisms, mis-adjusted finger tension, worn knockoff brushes, or from driving too fast.

Aged seed conveyor belts may not deliver kernels properly to the seed chute. Mis-adjusted air pressure, leaks in the system, worn knockoff brushes, or wrong disc sizes may cause uneven seed drop with air planters.

Don't forget that small gaps will always occur due to the fact that less than 100 percent of the kernels planted actually germinate. Warm germination percentage of seed corn typically ranges from 90 to 95 percent, thus perfect *final* stands are rare.

Keep in mind that stand reductions caused by weather- or pest-related damage may also result in unevenly spaced plant survivors within the rows. Perhaps replant decisions should take this additional yield loss into considerations.

Preventive Guidelines.

Use the following pointers to check your planter before planting:

1. With plate-type planters, match the seed grade with the correct planter plate,
2. Planters with finger pick-ups should be checked for wear on the back plate and brush, use a feeler gauge to check tension on the fingers, then tighten them correctly,
3. Check for wear on double-disc openers and seed tubes,
4. Make sure the sprocket settings on the planter transmission are correct,
5. Check for worn chains, stiff chain links, and improper tire pressure,
6. Lubricate all chains and grease fittings,
7. Make sure seed drop tubes are clean and clear of any obstructions,
8. Clean seed tube sensors if you have a planter monitor,
9. Make sure coulters and disc openers are aligned properly, and
10. With air planters, match the air pressure to the weight of the seed being planted.

Causes of Delayed Emergence.

All you need for perfect emergence in a corn field are 1) adequate soil moisture, 2) adequate soil temperature, and 3) adequate seed-to-soil contact. Pretty simple, isn't it? In practice, however, one or more of these factors is limiting and the resulting germination or emergence is uneven.

The **primary causes** of delayed seedling emergence in corn include 1) soil moisture variability within the seed depth zone and 2) poor seed to soil contact due to cloddy soils, inability of no-till coulters to slice cleanly through surface residues, worn disc openers, and misadjusted closing wheels.

Other causes include soil temperature variability within the seed zone, soil crusting prior to emergence, occurrence of certain types of herbicide injury, and variable insect and/or soil-borne disease pressure.

Tips for Preventing Delayed Emergence.

Inspect the condition of the double-disc openers before planting. Worn disc openers may slice a "W" shaped seed furrow rather than a "V" shaped one, making it difficult for the closing wheels to adequately firm the soil around the seed. Remember, you want good seed-to-soil contact, not good seed-to-air contact!

Determining the correct seeding depth may be one of the biggest decisions a corn grower makes in the field during planting. The key is to make sure seed is placed uniformly into moist soil. Check seeding depth every time you pull into a new field or start a new day. If your planter has rocker arm assemblies to "smooth" the effects of surface rocks on depth, make sure the assemblies are well lubricated and are operating as they should.

Coulter down-pressure and depth for no-till planting should be adjusted for each field's soil and residue situation. Make sure the coulters slice cleanly through the residue, rather than pinning residue inside the seed furrow. If your single coulters just can't cut through residue no matter what you do, then maybe it's time to consider one of the many types of planter attachments that move, sweep, brush, incorporate, or otherwise manage residue. Remember, you want good seed-to-soil contact, not good see d-to-residue contact!

Adjust the tension of the closing wheels according to the soil conditions. Make sure the seed furrow is being closed and firmed adequately. Too little tension in no-till may result in open slots. Too much tension may result in compaction over the seed or may actually decrease the uniformity of seeding depth by occasionally pinching kernels upward.

Finally, if you are practicing reduced tillage and especially if you are planting on the early side, be conscious of soil temperature variability. While corn will germinate at soil temperatures of 45 to 50 degrees F, minor drops in temperature below this range may significantly decrease the uniformity of germination. If crop residues are not spread evenly throughout the field, avoid planting until average soil temperatures are closer to 55 or 60 degrees.

For more information on this subject, contact me for a copy of **AGRY-91-01**, *Stand Establishment Variability in Corn*. My phone number is 317 494 4802, FAX number is 317 496 1368, INTERNET address is *rnielsen@dept.agry.purdue.edu*.

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