# Northern Ohio Field Notes

**April 13, 2023 John Schoenhals, Pioneer Field Agronomist**

**This week's topics include:**

- **Why do early planted soybeans deliver more bushels?**
- **Planting Corn After Pre-Plant Anhydrous Ammonia Applications**
- **Planning to Achieve Corn Uniformity**

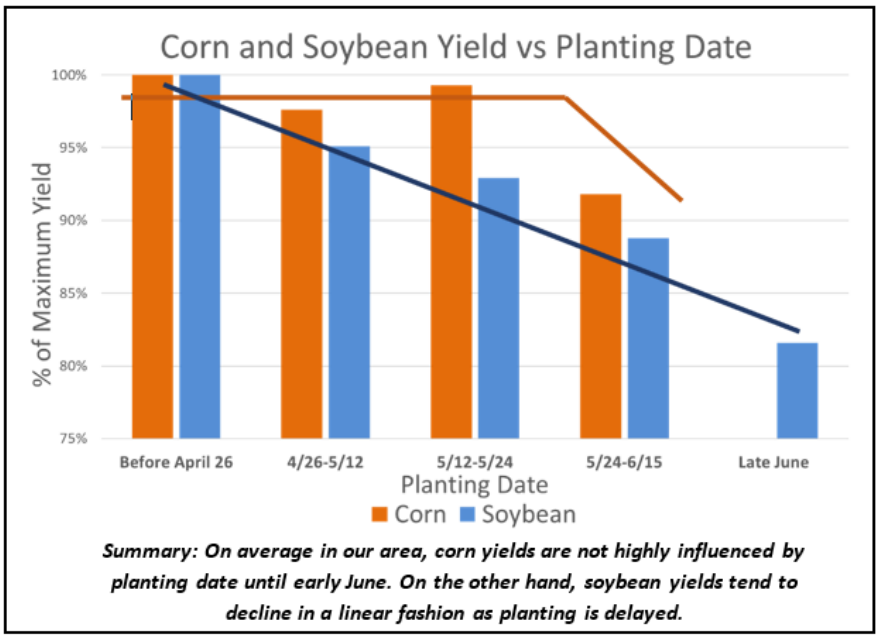
## Why Do Early Planted Soybeans Deliver MORE Bushels?

"Early planted soybeans" can refer to different planting dates in different areas. In some areas, early- and mid-April soybean planting is possible this year. In other areas, "early" could mean early May planting dates if "normal" is often late-May or early-June planting dates.

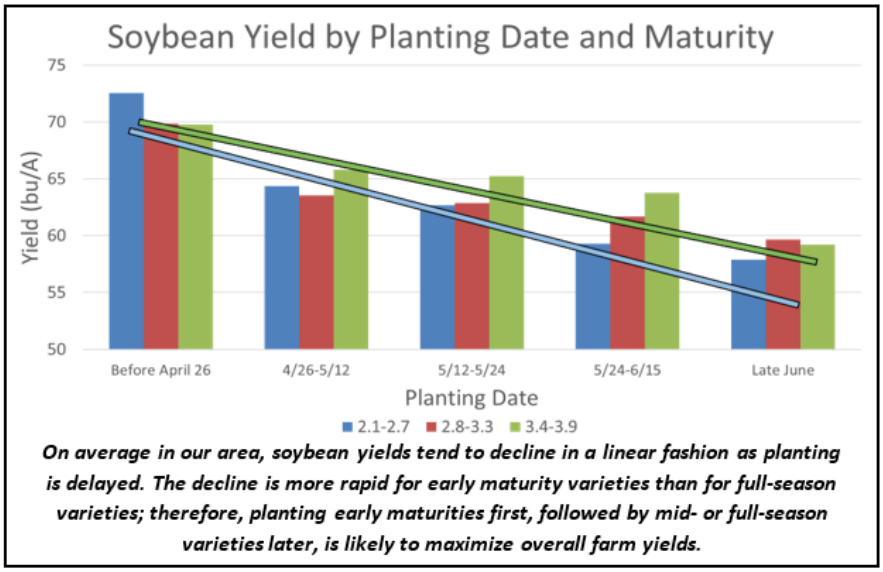
Earlier planting of soybean (relative to "normal") delivers higher yield due to the physiology of modern soybean varieties. Timely planting allows for soybean to maximize light interception, achieve increased node number, and lengthen the seed filling period.

- On average, soybean plants add one main stem node every 3.7 days after the first trifoliate appears until seed development begins.
    - Delaying planting by 7 days can result in the loss of two main stem nodes **(more nodes = more yield opportunity)**
- The beginning of soybean flowering is influenced by the length of days and nights. Earlier planting can allow flowering to begin several weeks before the summer solstice and continue for a longer time. **(longer flowering and pod set time = more pods = more yield)**
    - Recent data has shown that a 30 day delay in planting can reduce the duration of seed fill by up to 10 days

Ensuring that soil conditions are favorable when performing tillage or planting operations is vital --- working in a field that is "border-line fit" or too wet can cause compaction that may restrict root growth/plant development and could persist for the entirety of the growing season.




***Summary: On average in our area, corn yields are not highly influenced by planting date until early June. On the other hand, soybean yields tend to decline in a linear fashion as planting is delayed.***

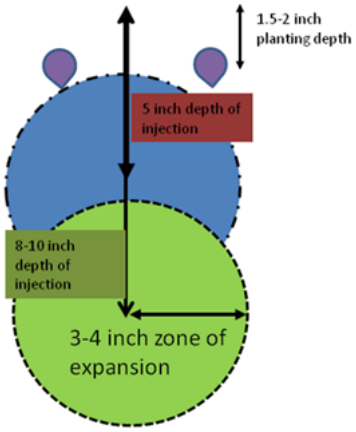



***On average in our area, soybean yields tend to decline in a linear fashion as planting is delayed. The decline is more rapid for early maturity varieties than for full-season varieties; therefore, planting early maturities first, followed by mid- or full-season varieties later, is likely to maximize overall farm yields.***

*All data from 2016-2022 PKP in N Ohio, far NE Indiana, far SE Michigan*

# Planting Corn After Pre-Plant Anhydrous Ammonia Applications

- Although there is no magic number of days to delay planting after ammonia application, waiting at least 5-7 days or longer is a good rule of thumb.
- If you cannot wait 5-7 days after ammonia application to plant, apply the ammonia as deep as possible. After injection, it expands in all directions 2½ - 3", leaving a 5-6" cylinder of nitrogen (expansion can be even greater in dry or coarse soils). Therefore, an application of NH3 applied 5 inches deep (expanding 3" in all directions) and a planting depth of 2" leaves the seed and emerging root system susceptible to direct contact with the ammonia band.
- Applying the ammonia parallel with the corn row and planting with RTK GPS guidance at least 6" to 7"to the side of the ammonia band will minimize the potential for seedling injury.
- More Details: https://corteva.showpad.com/share/G6dsKdPyAc4razaW9liNB




Applying ammonia 8-10 inches deep can help prevent seedling injury by keeping the seed out of the zone of ammonia expansion

# Planning to Achieve Corn Uniformity

"Variability" is not a word any farmer wants to use to describe one of their corn fields, and variability of emergence can have a significant effect on yield. According to Dr. Jeff Coulter of University of Minnesota, uniformity of emergence is by far the most impactful on yield of the following 4 "planter pass" factors.

1. Achieving uniform emergence (5-9% impact on yield)
2. Planting within the optimum date window (2-5% impact on yield)
3. Achieving the correct plant population (1-2% impact on yield)
4. Achieving uniform plant spacing (1-2% impact on yield)

Optimum timing for corn planting in northern Ohio is late-April through mid-May. However, to achieve uniformity and maximize yields, it is more important to pay attention to specific soil conditions and the upcoming weather forecast, rather than chasing a specific calendar date.

Corn kernels must absorb ~30% of their weight in water before the germination process begins. A seeding depth of 2 in. has been found to provide the most consistent combination of moisture, temperature, and seed-to-soil contact for uniform germination and emergence. Inadequate seed-to-soil contact, a dry seedbed, or a rapidly drying seed zone may provide less than optimum absorption of water, causing the germination process to slow or stop completely. **Corn kernels that absorb excessively cold water (less than 50° F) during the first 24 to 48 hours of germination may experience serious injury, resulting in erratic emergence.**

**Corn typically requires ~120 GDU's to emerge**. Under ideal conditions, corn will emerge in 5-7 days but with cooler soil temperatures the process may take 3+ weeks. Between germination and emergence, factors altering soil temperature around individual seedlings will have significant impact root and shoot growth. Leading causes of plant growth variability include inconsistent seeding depth, variation in soil moisture, changes in soil type/topography, or uneven distribution of crop residue (i.e. seeds planted into heavy residue can require an additional 30-60 GDUs due to cooler soils compared to seeds planted into bare soil nearby)

*Seed treatments offer 10-14 days of protection against common early season pest and pathogens.*

**Summary of corn planting guidelines to maintain uniformity…**

- ***Soil temperature of at least 50° F at 2" depth and preferably a warming trend in the 3-5 day forecast***
- ***Minimum of 24 hours rain-free following planting.***
- ***Avoid planting right before a period of large temperature swings.***