

A Few High Yield Corn Thoughts

Hybrid Selection: To increase yields, obviously, you need a product with high yield potential. But, you also need to match the right hybrid with the traits needed for your field. It is not as much about picking the highest yielding product as matching the best hybrid for your field. That is ideal product placement.

Population: It is not always about cranking population as high as you can. You have to maximize the right population to each hybrid x field combination. Some hybrids respond to more population and some don't. We have data and recommendations to help with this decision.

Planter: The planter pass is the most important across the field. The planter not only determines seed spacing and population, but it is also responsible for seed to soil contact, planting depth, seed furrow and sidewall conditions, etc. Take the time before planting to ensure your planter is ready for the most important field pass of the year. Check out the "Top 10 Preseason Planter Tips" (https://www.pioneer.com/us/agronomy/pre_season_planter_tips.html).

Compaction: In certain years, compaction can rob a significant amount of corn yield (some sources say 10-20%). Before the start of the growing season, ensure that your field is not plagued by compaction. Utilize a compaction probe, or a shovel at a bare minimum. Fall is the ideal time to remedy compaction problems.

Soil Test: The only way to know how much money you can spend is to know how much is in the bank. Soil fertility is no different. The only way to know what your nutrient bank looks like is to soil test. If you haven't soil tested in the last four years, it is time to find out what is in the bank. If you are comparing to historical soil tests, then you need to sample at the same time of year to keep things consistent (i.e. fall vs. spring).

Fertility:

- Step #1 for any fertility program, after soil testing, is to **fertilize to your actual yield goal**. Many times we fertilize to a lesser yield goal than we actually want. Set your fertility goal to what you actually want to raise.
- There is a difference in the value of nutrients that are removed from the field at harvest and those that are taken up by the corn plant throughout the season. You have to maintain high enough fertility values that the corn plant has enough to take up throughout the season for max yields. The chart below shows the **needs of a 300 bu/a corn crop for grain and stover**.

Table 2. Estimated amounts of selected nutrients in corn at maturity to support a 300 bu/acre grain yield.

Nutrient*	Nutrient Content per Bushel of Grain			Total Uptake: 300 bu/acre Corn Crop
	Grain	Stover	Total	
	———— lbs/bu ————			lbs/acre
N	0.67	0.45	1.12	336
P ₂ O ₅	0.35	0.16	0.51	153
K ₂ O	0.25	1.10	1.35	405
Mg**	0.09	0.14	0.23	69
S	0.08	0.07	0.15	45

* Reference: IPNI, 2014

** Reference: IPNI Plant Nutrition Today, Fall 2008, No. 4.

- Soil pH.** Maintaining optimal soil pH is key to providing optimal nutrient availability. If you have an extremely acid soil, liming it becomes the priority over fertilizing it because of the effect on nutrient availability. A soil pH of 6.5 begins to maximize nutrient availability.



WITH YOU
 FROM THE
WORD GO

Fertility (cont.):

4. If you apply fertilizer every other year, try moving to an **annual application**. I realize fertilizer applications every year might be used as a costs savings for many operations, however, folks pushing for higher yields are not relying on on crop to “scavenge” the year after a fertilizer application. You might be surprised at the response to an annual application.
5. **Spoon-feed**. It is no surprise that many of the high yield guys are spoon-feeding their crop with multiple in-season nutrient applications. That is the ideal way to feed the plant nutrients. Consider adding an in-season application if you are not doing one. If you already do some split applying, try adding one more application. This is especially true with nutrients like nitrogen. Some important milestones in the plant:
 - V6 – the plant is determining ear kernel rows around (ear circumference) and nitrogen demand is getting ready to drastically increase
 - V12- the number of kernels per row is being determined (ear length). Nitrogen demand is big.
 - Some other high yield guys use other timings like V3 (plant investing in nodal roots and moving off seedling reserves), or R1/R2 to top off the tank before grain fill.
 - Keep in mind you need roughly 1 lb of nitrogen per bushel (this number changes a little depending if you side-dress, planting corn after soybeans, or corn after corn – more nitrogen needed corn after corn).
6. **Sulfur**. If you are not already adding sulfur to your mix, or if you are using elemental sulfur, consider adding a sulfate product like AMS (21-0-0-24) to your program. For most programs, 100 lbs of AMS per acre will give you enough sulfur. Some folks use a ratio of 10 lbs of N to 1 lb of S (or some use 12:1) to determine their need. Sulfate is losable like nitrogen, so it needs to be applied in the spring pre-plant or early side-dress.
7. Some nutrients are “**front loaded**” by high yielding corn. Pioneer’s recent research on tissue sampling showed that potassium concentration at V6-V8 was the nutrient most correlated to yield at this stage in 270+ bu/a corn. This data also showed that in 270+ bu/a corn, the plants were taking in very high concentrations of nitrogen and potassium at V6-V8. So, you need to have plenty available at this stage.
8. **Tissue testing**. Pick out a high yielding spot in a high yielding field and tissue sample it at V6-V8, VT-R1, R3-R5, and compare it to our new sufficiency ranges (page 11, table 5 in the 2021 Agronomy Research Summary). It was developed from tissue samples collected all over the U.S. by Pioneer on locations 270+ bu/a and above.

Weed Control: Obviously, we need to keep the field clean. The corn plant can sense weed competition, and start decreasing yield potential, before the corn even emerges from the soil. One-pass herbicide programs offer ease and convenience, but year in and year out the two-pass program always wins. It takes a good residual upfront and a timely post-emergence application.

Fungicide: To gain maximum yields, you have to maintain as much photosynthetic factory (green leaf area) as possible. Most years we have some level of disease out there. Protect that leaf area with fungicides. Keep in mind, under heavy disease pressure (i.e. Southern Rust or Northern Corn Leaf Blight) it may require multiple passes of certain fungicides or a premium fungicide product to sufficiently protect leaf area. NCGA high yield growers typically make multiple fungicide applications (some 2-3 in season).

Biologicals: It seems like every contest grower is using one. With as many products that are in this space, and as much research occurring here, I believe there has to be some value to some of them. The problem is that there is no good test, or way to tell which one might be beneficial for your geography and management. It requires “on farm” testing to figure it out.