By Phil Needham

Build Yields from the Seed Up

When your goal is to maximize wheat yields, paying attention to the details at planting and good management throughout the season builds the yield to its full potential.

Sights on seed weight. When seeding wheat, some producers need to change their thinking. For example, before intensive wheat management came to Kentucky, it was common for producers to sow 2 bu. of wheat per acre. We found that this practice was not a good strategy because seed sizes can significantly vary. It's possible with a certified variety to have 9,500 seeds per pound, but a batch of farmer-saved seed that isn't cleaned well could have 20,000 seeds per pound.

Seeding rates are influenced by rainfall, planting date, seeding depth, tillage and fertility levels. It's important to plant by live seeds per square yard, just like corn and soybeans.

Depth and uniformity. Achieving consistent depth and uniformity primarily depends on the condition of seeding equipment, especially disk blades, bearings, boots and other wearing parts. Many no-till drills require additional ballast to consistently penetrate heavy residue and/or hard soils. Few manufacturers have changed their designs to help penetrate the higher-yielding crops, especially no-tilling wheat into Bt cornstalks, which is common in the Southeast, where improved scab-tolerant varieties are available.

Based on my research, when moisture is available winter wheat needs to be drilled to a depth of around 1". However, in a heavy crop residue, no-till environment seeding depths will need to increase.

Almost all the row spacing research trials I have conducted have concluded with narrow rows (6" or 7.5" row spacing) outyielding wider rows. There have been only a few trials in high-stress environments that resulted in wider and narrower rows yielding the same. Not a single one of my trials across the Midwest, Central Plains or Northern Plains has ever resulted in yields from wider rows exceeding narrow rows. Yes, drills and seeders with wider rows are slightly cheaper than those with narrow rows, but growers can't afford not to plant narrower row spacings.

Plant populations should be calculated soon after emergence to make spring nitrogen rate and timing decisions. I have seen fields that had 40 to 50 plants per yard of row in one area and 20 to 25 plants per yard of row in another. Upon closer examination, some of these differences were a result of the drill/air seeder not metering seed consistently, seeding depth differences or other soil-specific differences. While it's not easy to achieve perfectly consistent stand counts across the field, hitting that mark as close as possible is necessary to generate stands capable of producing high yields.

Fine-tune your wheat production at planting and during the growing season for maximum yields

Protection measures. Once seed is in the ground, scout fields regularly in the fall and early spring for insects, weeds and diseases, which can all have a huge impact on yields and profits.

If you are in a no-till rotation, be sure to use a burndown herbicide ahead of planting if sufficient weed populations exist. Not only will this control weeds, it will also help control most insects, which host within the weeds. If annual broadleaf or grass weeds emerge in the fall, take care of them before they compete with the crop for light, nutrients and moisture. My research, as well as other studies, supports the use of fall-applied herbicides.

While some producers don't want to make the additional pass across the field in the fall, there are many examples where growers could not afford to wait until the spring. Sufficient yield loss would have occurred that the chemical application and pass across the field were more than paid for.

Some insects, such as aphids, feed on the crop directly. Vector viruses like barley yellow dwarf can have a significant effect on grain yield and quality. I use a threshold of five aphids per square foot in the fall and early spring to pull the trigger on insecticide applications.

If growers have had a history of aphids or barley yellow dwarf, seed treatment insecticides are also a good investment, especially for early-planted fields. While scouting for weeds and insects, also be on the lookout for early-season diseases, which have the poten-

Wheat emergence can vary as a result of inconsistent seed metering, uneven seeding depth or variation in residue distribution.

tial to be much higher in no-till fields, especially those with cereal residue. Seed treatment fungicides help in these environments, but only for a few weeks after emergence.

Many producers miss the target when it comes to scouting their fields, quantifying stands and understanding tiller populations. Remember, if you can't quantify it, you can't manage it.

Nitrogen factor. Some producers continue to struggle with uniform nitrogen applications, resulting in streaks in fields, mediocre yields and poor standability at harvest. I discourage the use of spinner spreaders unless they have been pattern-tested for the product being applied that particular season.

Urea and ammonium nitrate are good forms of dry nitrogen, but air trucks frequently distribute these products more accurately and consistently across fields.

For most production areas, I prefer liquid nitrogen applications that can be applied with farmer or custom spray rigs equipped with stream bars to minimize leaf injury. Research shows a yield benefit to liquid nitrogen compared with urea. This is possibly a result of the staged release of the urea and ammonium nitrate that's dissolved in the liquid product, or a reduction in volatility, which can be a concern with dry urea when rainfall does not occur soon after application. Row-crop spray rigs can also be used for later-season nitrogen applications, using the same wheel tracks as those used for herbicides or other passes.

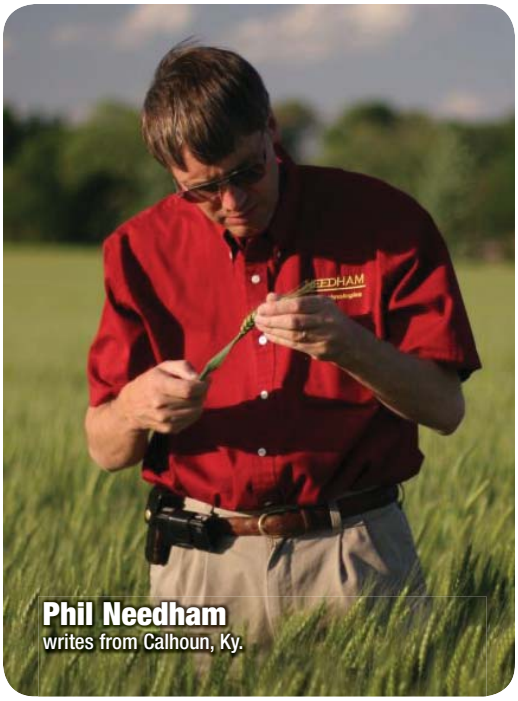
Split-applied nitrogen is used by most of my clients who target yields of 100 bu. per acre and higher. Split applications minimize risk and push yields higher by allowing the grower to more accurately determine the total nitrogen requirement later in the season. Some producers still apply all their nitrogen in a single application at green-up or before for convenience reasons, not because the crop requires it.

When split-applying spring nitrogen, the first application should be timed at or slightly prior to the green-up stage. Base your application rates on tiller densities and plant health. Apply higher rates to later planted, thinner fields and lower rates to early emerging, over-tillered fields.

Apply the balance of spring nitrogen around jointing. Jointing is the end of tillering, so by applying the balance of nitrogen at this stage, you can increase yield without boosting tiller populations or standability problems. Most growers with standability problems have excessively thick fields, caused by nitrogen applied too early.

Sometimes nitrogen requirements can't be precisely determined, even at the jointing stage, as indicated by yellowing lower leaves or low tissue concentrations of nitrogen. In this situation, later applications may be justified.

The most profitable wheat producers I work with are willing to apply 20 lb. to 30 lb. per acre of late season nitrogen (just prior to flag leaf emergence), if yield potential appears to be more than what we initially fertilized for. While it means another pass, growers have added 5 bu. to 10 bu. per acre. With current prices, that's worth the trip. Focus on crop requirements, rather than convenient applications.



Phil Needham
writes from Calhoun, Ky.

Liquid nitrogen can be easier to apply with farmer-owned or custom equipment with stream bars that minimize leaf injury and maximize uniformity.

Mail questions to Phil Needham, Farm Journal, P.O. Box 958, Mexico, MO 65265 or e-mail *wheatcollege@farmjournal.com.* Questions will be answered on this page. Individual replies are not possible. The information provided here is not considered a replacement for personalized agronomic consulting.