

Push No-Till Wheat Yields Higher With These 5 Simple Tips

European wheat producers achieve triple-digit yields, and perhaps you can, too.

By Martha Ostendorf, Contributing Editor—No-Till Farmer.

COME HARVEST, TWO words are on every wheat producer's lips - yield and price. Coffee shops buzz with producers trying to one-up their neighbors in both categories. But, according to Phil Needham, owner of Needham Ag Technologies, U.S. wheat producers should be looking to their European neighbors for a real challenge in the wheat yields game.

Needham, who grew up on a farm in England and has served as a crop consultant around the globe, says he can likely beat any U.S. wheat producer's top yield. The good news is he's willing to share some of his secrets.

According to Needham, many countries in Europe regularly average 120 to 130 bushels per acre of wheat. He says England's national wheat average has not dropped below 110 bushels per acre within the last 15 years, with top producers experiencing field averages well over 200 bushels per acre. Many U.S. states average less than 50 bushels per acre.

"The difference in yield between Europe and the United States, Needham told attendees at the 2008 National No-Tillage Conference, occurs partly due to intensive management and partly climate. "Plus, most European farms are smaller and that becomes a conflict in this country because farms are generally larger and farmers don't spend as much time in their fields looking for problems" Needham says. "Still, there are a lot of opportunities for producers to concentrate on the details and do a better job on the acres they farm."

Needham has proven there is plenty of value to be gained in U.S. fields. Needham has worked with farmers, other agronomists and university personnel to help introduce European-style intensive wheat management practices that have contributed to more than a doubling of the Kentucky state yield - from the low 30s to the low 70s - during the past 15 to 20 years.

On one South Dakota farm, he worked with a producer that only previously achieved 60 to 65 bushels per acre on his best field. Through intensive management, they boosted yields to more than 100 bushels per acre on many fields, just by concentrating on the fine details, which add up to make a big difference at harvest time.



GOAL IS UNIFORMITY. Intensive management with the goal of uniform wheat stands helps European producers achieve 150- to 200-bushel wheat fields. Triple-digit yields also have been achieved in the United States by following similar management programs.

Needham adds "Uniformity is something that frequently increases yields without increasing input costs."

Photo by Phil Needham

There are a number of factors which impact wheat yields: lack of moisture, low fertility, poor stands, poor soil structure, disease and insects. Needham tries to help U.S. producers identify and eliminate each of these factors to achieve stand uniformity, which he says is the key to better yields and more profit.

"One of the little things that can make you more profit than anything else is stand uniformity," Needham says. "When I go out in a field in England, I expect to see roughly the same number of heads per square yard in every region of the field. Within the US there is generally a lot of variability and this is a big opportunity to boost yields".

1. Improve Stand Uniformity. According to Needham, it's important that producers select seed varieties appropriate for their area and field conditions. He suggests each producer plant two to three new varieties alongside existing ones to determine how they perform with their fields and management systems. He also adds that producers planting wheat after corn should plant a variety with good tolerance to fusarium (Head Scab).

"I have seen 10 to 30 bushel per acre differences, just by selecting an appropriate variety for no-tilling into cornstalks," Needham says. "It's important to plant a quality wheat seed just as you would when planting corn and soybean."

He also suggests planting graded seed; using a seed conditioner with a gravity table is best to select for larger, more vigorous seeds. Once producers have this quality seed, it's just as important to protect the investment. "Everybody should be using a seed treatment fungicide," advises Needham. "The benefits of seed treatment are obvious. They protect plants from early season foliar, stem and root diseases, plus some of the new seed treatments can protect young plants from early aphid and wireworm damage.

Needham says the uniformity of the seed treatment application also is important. Producers spraying seed treatment into an auger as seed is taken from seed truck to air seeder will get some seeds with double treatment and some with no treatment at all. "What you'll find in this case is seeds that have a heavy rate of seed treatment may be retarded and take longer to come through the ground, and then you've got seeds that have no protection at all," Needham says.

Producers opting to omit the seed treatment insecticide should scout regularly for aphids. Needham suggests a foliar insecticide application if aphid populations exceed a threshold of 5 per foot of row on 7.5-inch rows.

2. Timely Chemical Applications. "If weeds are present early in the season, I encourage producers to spray them in the fall," Needham says. "I have frequently seen 3 to 7 bushel per acre yield reductions in replicated trials, when you spray weeds in the spring only compared to fall applications".

Timely spraying also makes Needham's must-have checklist. "You should have reliable sprayer capacity to be able to treat all your wheat acres in 4 to 5 days," Needham says.

"Many farmers plant all of their acres in the same variety, so if you get a rainfall event during flowering, it becomes almost impossible to treat all the acres in a timely fashion." Needham strongly suggests that growers plant a range of different maturities, from early to late - to spread their risk and widen the spraying window. "My grandfather farmed all his life and always told me the difference between a good farmer and a bad farmer was a week. Today, 30 years later, I would say it might be down to 1 or 2 days", Needham says.



APPLY EVENLY. Needham recommends stream bars for uniform liquid nitrogen applications.

Stream bars deliver coarse, vertical streams for even and accurate application regardless of boom height - even in 10 to 15 mph winds. 3 Hole nozzles by comparison can cause streaks and increased leaf injury.

Photo by Phil Needham

3. Population - Place Seed With Purpose. "Approximately 600 heads per square yard is generally the head population we shoot for in England to achieve 200 bushel per acre wheat," Needham says.

The population of heads per square yard a producer should target within the United States is dependent on location and available moisture. But, generally, 500 to 600 heads per square yard is the target for most regions.

Needham says to achieve these head densities, farmers should begin with the end goal in mind. He says the earlier wheat is sown, the more it tillers; the later wheat is planted, the less it tillers. So he suggests planting wheat by seed population, not by pounds per acre. He recommends seed populations of 250 to 300 live seeds per square yard for early planting dates and 350 to 400 seeds per square yard for later planting dates or when seeding into heavy residue within cooler no-till conditions. "A lot of producers can improve their yields by generating a more appropriate number of heads per square yard," Needham says. "I have been in fields with 1,000 or 1,500 heads per square yard at harvest and then the producers wonder why their yields were disappointing. In principal, they had 100 bushel per acre straw and 50 bushel per acre wheat, where the additional leaves and stems absorbed excessive moisture and nutrients, plus increasing the foliar disease risk."

Generating those head consistently across the field also is important, and uniform seed placement at planting time is the key to achieving improved yields. Needham notes that GPS guidance technology now allows producers to plant wheat between the previous crop rows.

"If planting wheat after wheat within the Central Plains, there's data showing 5 to 7 bushel per acre yield responses when planting wheat rows between the previous crop's wheat rows. I think a lot of that is a result of reduction in soil and seed-borne diseases," he says. "Similar benefits can be achieved when planting wheat between corn rows, which helps keep the planter units off the high volumes of residue", Needham adds.

"It's important to plant quality wheat seed just as you would with corn and soybean..."

In situations where fields are smaller and guidance technology isn't cost-effective, Needham suggests planting at a small angle - 10 to 15 degrees for example to the previous corn rows. And for even better yields, he suggests considering narrow rows.

"The narrower the rows, the higher the yield," Needham says. "If you want to use a corn planter to plant wheat, go ahead, but plant a second time at an angle or split the middles using higher accuracy GPS guidance. I know that's two passes, but I've seen between 10% and 15% yield reductions from just planting wheat on 15-inch spacing." Differences are noted even at smaller row widths, and Needham says he's observed 3 to 5 bushel per acre differences between 10 and 7.5 inch rows.

4. Keep Close Eye On Fertility. Behind moisture, Needham says fertility is the next weakest link in wheat production that producers are able to tackle. The first step is soil testing. "Understanding what your fertility levels are and what you need to do in regards to fertility is very valuable," Needham says. "You may find you need to spend more money on some elements and less on others. The net cost may be the same per acre, but essentially you are divvying up your costs and allocating them to the appropriate areas." A not-so-cheap, but definitely beneficial, option is a well-timed, post-applied spring nitrogen program.

"Nitrogen is a very expensive, but very responsive, element. It's a beneficial tool for producers in regards to yields and to uniformity," Needham says. "It's important to deliver the right rate, but it's more important to deliver the rate uniformly across the field and at the correct time."

If producers plan to use urea as a more affordable nitrogen source, Needham encourages the use of an air truck for application.

"I've seen more problems in regards to uniform delivery with spinner trucks or spinner spreaders. An air truck just gives a uniform delivery that's unmatched," he says. Urea is a good source of nitrogen, but Needham urges producers who don't have access to air trucks consider liquid nitrogen.

"With urea, you will have a lag from 10 to 14 days before it gives you an appropriate amount of nitrate. If you've got poor plant health, use liquid nitrogen. It's going to be available much more quickly," explains Needham.

5. Rate and Timing. When determining nitrogen rate, Needham recommends a split-applied program for spring applications.

"If you have early planted fields with lots of tillers, apply 30 to 40 pounds of nitrogen early - at greenup - and come back with the balance at first joint," he says. For later planted or thin fields, he recommends producers use a heavier rate of 60 to 70 pounds early, and apply the balance at jointing.

"What we're doing to get a final head population in that 500 to 600 range is looking at plant health and the number of tillers, and then using nitrogen timing as the throttle to help manipulate canopies and manipulate tillers and heads up or down," explains Needham.