



Diversify And Win With No-Till Wheat

Adding wheat to a corn-and-soybean rotation improves soil structure, spreads equipment use and protects income.

By Martha Ostendorf,
Contributing Editor

Rotation is good. The earth's rotation keeps our feet flat on the ground. Rotating tires ensures even wear. And rotating wheat with your no-till corn and soybeans can lead to good things, too.

"Wheat has a fibrous root structure that is more like a prairie grass. Those grasses are the reason we have such wonderful soils in the tall-grass and mixed-grass prairies throughout and just west of the Corn Belt," says Dwayne Beck, manager of the Dakota Lakes Research Farm in Pierre, S.D.

He says imitating nature is a great way to improve soils and overall production for all crops. By adding wheat, producers can come close to imitating that natural mix, boosting residue and organic matter.

"Even in no-till, a corn-soybean rotation depletes overall soil organic matter levels," Beck says. "With soybeans, you lose organic matter; with corn, you usually break even or build a bit. In a corn-soybean rotation, you are likely losing organic matter, especially compared to native vegetation.

IMITATE NATURE. With its fibrous root structure, wheat is more like prairie grasses, the reason the Corn Belt has wonderful soils, says Dwayne Beck, manager of the Dakota Lakes Research Farm in Pierre, S.D. By adding wheat, no-tillers can come closer to imitating nature and boost organic matter.

"Add wheat — a high-residue crop — to the rotation, and you start to tip things in your favor. Using high-residue cover crops helps even more."

And the diversity wheat brings is essential for long-term viability of all crops and technologies, Beck adds.

ed and harvested at different times."

At Dakota Lakes Research Farm, they've tried a variety of rotations with wheat on their no-till acres, including corn-corn-soybean-soybean-wheat-wheat and corn-corn-soybean-wheat-soybean.

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"Corn and soybeans isn't a rotation — it's a two-crop monoculture," Beck says. "It's too predictable and gives pests, such as the corn rootworm beetle and the soybean variant corn rootworm beetle, the chance to adapt."

"Using *Bt* varieties can help, but doing continuous corn or corn-soybean rotations can still lead to problems like glyphosate-tolerant weeds. We need to use more biological solutions, such as planting different crops, especially those that are plant-

The rotation must be unpredictable for pests. So far, their rotation has proven to be just that, Beck says.

"We haven't used an insecticide since the 1990s and we haven't used a grass control product in wheat since the '80s — and we don't need to use rootworm *Bt* or herbicide-tolerant hybrids," Beck says. "At \$80 per bag versus \$200 or more per bag for high-end seed, that's a huge savings in seed alone, not to mention the reduction in other input costs."

Burying Tillage Misconceptions

James Herbek, University of Kentucky grain crops specialist, says adding wheat to the mix has long been the practice in Kentucky.

But while producers practiced no-till for corn and soybeans, they often would till to manage corn residue before drilling wheat.

"A lot of our grain producers were leery of no-tilling wheat because they thought yields would decrease," Herbek says. "We've done continuous no-till with wheat for 16 years. At first, no-till wheat didn't yield as well, but after 5 or 6 years, the tilled and no-tilled wheat both performed about the same. That's on par for progression of any no-till system."

While no-till wheat eventually held its own in yields, they also found that it was having positive benefits on subsequent crops in the rotation.

"Between a pure no-till system and one that included tillage prior to wheat planting, the majority of the time the corn yield and double-crop

soybean yields were higher in the pure no-till system," Herbek says.

A University of Kentucky study showed a 3% yield benefit for soybeans and an 8% yield benefit for corn in a pure no-till rotation with wheat when compared with tilled wheat in the same rotation.

"We credit the increase in yields to the soil structure changes that occur," Herbek says. "In pure no-till, there were larger soil aggregates and more medium-sized pores. The increased residue and changes in pore size and distribution meant soils had greater water-holding capacity and better infiltration, so more water was available for growing plants."

No-Till Success

For seed producer and no-tiller David Hula, planting wheat behind corn required a lot of effort before he switched to no-till wheat.

"After corn, we would plow, disc and run a culti-packer over our ground and then plant our wheat crop, so obviously the economics of

no-till wheat are better," says the Charles City, Va. producer. "First and foremost, we're saving on fuel, labor, manpower and time."

Hula's typical rotation is corn followed by wheat, barley or oats, which are then double-cropped with soybeans. Virginia Tech told Hula that no-till wheat following corn wouldn't work because of scab.

"They said scab could happen once every 7 or 8 years," Hula says. "We have drought 2 out of 7 years and we still plant corn, so why not?"

Hula helps manage scab risk by selecting wheat varieties that are more tolerant to the disease.

While scab hasn't been a limiting factor, they did find planting into the corn residue to be a bit of a challenge. Some adjustments included increasing the seeding rate and planting wheat a little deeper.

On Renwood Farms, Hula deals with fine, sandy loam soils that don't hold moisture well. The increased residue from no-till wheat has helped keep more moisture in the soil profile. That has paid off with increased yields in his other crops. And he's seen his wheat yield well, too.

"We've seen no-till wheat yields as high as 140 bushels and as low as 50 bushels per acre depending on soil type. In 2008, our yields averaged a little over 90 bushels per acre across 1,700 acres of wheat," Hula says.

Good yields are achieved through intensive management. Hula scouts for insects like Hessian fly and aphids, diseases and other problems. He manages early seedling aphids with seed treatments and treats later-occurring aphids with pyrethroids. In dry years, he notes more thrip activity in soybeans behind no-till wheat.

"If we find an outbreak of insects or something, we try to knock it out as fast as we can," Hula says.

At harvest, he uses a stripper header to leave wheat straw standing.

"It's easier to plant soybeans into and we've noticed planting into wheat straw helps keep deer out of the soybeans. They don't like sticking their head into standing straw," Hula says.

Spend Money To Make Money With No-Till Wheat

Wheat has been treated as a second crop in Ohio for a long time, says Bryan, Ohio, no-tiller Allan Dean. But with intensive management practices and some good weather, it has great yield potential.

Dean rotates winter wheat and soybeans and utilizes annual ryegrass and tillage radishes as cover crops. In the late '90s, Dean dropped corn from his rotation and has made up the difference by raising intensively managed wheat.

"We've simply opted to spend more time and effort in the spring with wheat instead of a corn crop," Dean says. "I wouldn't say taking corn out of the rotation hasn't hurt or helped us; it mostly just made things more manageable from a labor standpoint. We're very pleased with the wheat-and-soybean rotation."

But wheat has to yield for Dean to remain profitable, and he says the key to big wheat yields is using cover crops and intensive management. Dean's wheat program includes use of insecticides, fungicides and split nitrogen applications.

"We do a fertilizer application in the fall when we plant, then come back in the spring and do an early nitrogen application at a lower rate just as the wheat is coming out of dormancy," Dean says. "That gets the wheat growing."

"Then, we come back later in the season and put a bigger shot of nitrogen on to fill the wheat head. We don't like to put out all the nitrogen early because of weather risks and denitrification."

Dean uses stream bars to apply nitrogen and usually puts out 100 pounds of nitrogen per acre total. Rates per application are determined by the number of tillers, size of wheat and soil conditions.

"Intensive management makes the difference in wheat production," he says. "It takes study and it's a learning experience. I've attended many workshops."

One of the biggest challenges with wheat production, Dean says, isn't getting bushels into the bin — it's getting them out at a good price.

"Active marketing is important. We look ahead for good price levels, pricing wheat 1 to 2 years out and we always look for premiums, such as for good test weight," Dean says. "And a lot of the premiums we get for test weights and quality can be traced back to fungicide and insecticide use. That really improves quality and gives you a marketing edge."



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— Dwayne Beck

“Come harvest, that straw helps feed soybeans into the combine since our beans sometimes don’t get very tall.”

Spread Labor, Risk, Profits

“With corn and soybeans, you only have about 10 days to plant each crop,” Beck explains. “If you have a 30-foot seeder, you might be limited to farming a couple thousand acres to make sure everything gets planted.

“If you add wheat to the rotation, you stagger planting and harvest times, possibly allowing you to manage significantly more cropland.”

Besides covering more acres, Beck says producers also can get

more work out of their fixed assets, such as tractors, combines, grain bins and more, not to mention spreading labor over more months of the year.

Staggering planting and harvest dates by no-tilling wheat not only gives producers more time to rest, Beck says it can help them rest easy.

Because planting and harvest fall at the same time for corn and soybeans, poor weather at those times can mean double the trouble for producers growing only those crops.

“You have 100% of your acres at risk,” Beck explains. “If you have crops that you plant and harvest at different times, it spreads those risks.

“If it weren’t for crop insurance, I think we would see far greater diversity in our rotations.”

Herbek notes that not only will producers spread labor and risk, they also spread income during the year.

“Incorporating wheat into the system means another cash crop income in the middle of the year,” he says.

Added Opportunities

Bryan, Ohio, no-tiller Allan Dean says that no-tilling wheat allows him to take advantage of opportunities other rotations limit. The 30-year no-till veteran used to rotate corn, soybeans and wheat, but switched to just wheat and soybeans 10 years ago.

“We were to the point where we needed to update equipment and had looked into the viability of achieving high-yielding wheat through intensive management in our area,” Dean explains. “We decided to just go with one large air seeder that would han-

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NO-TILL WHEAT. While many growers have tilled cornfields prior to planting winter wheat due to scab and stand emergence concerns, David Hula has successfully no-tilled wheat in corn residue by increasing seeding rates and drilling deeper.

dle wheat and soybeans and eliminate a lot of equipment."

That decision cut Dean's equipment roster to one tractor, one seeder, one sprayer and one combine and opened new management doors.

"One of the greatest things about planting wheat is that it allows us to make field improvements after harvest," Dean says. "Because harvest is done in the summer, you have the time and the good weather to install field drainage systems, do field leveling or address areas where water tries to pond, especially when dealing with a new field or farm. That's tough to do after corn or soybean harvest because you get into rainy weather."

Once field improvements are made, Dean capitalizes on the extra growing season time by planting cover crops.

"Depending on where you live, using cover crops when just planting corn or beans can be hard. Generally, once corn and beans are off, it's too late for a cover crop. Having wheat in your rotation makes planting cover crops a possibility," Dean says.

Dean uses a stripper head to harvest wheat and leaves all the straw standing. In mid-August, he sprays the wheat stubble to take out weeds and grasses and then plants a cover crop into the residue. He prefers annual ryegrass and tillage radishes.

"Cover crops offer protection for our soils over the winter, prevents

nutrient loss to streams and helps control winter annual weeds," Dean says. "They also really improve soil tilth, making for ideal spring planting conditions. The soils dry off a little sooner because the cover crops use up excess moisture and because the soil is better aerated."

Dean has found that cover crops also help manage the wheat stubble.

"We often reach the 80- to 90-bushel mark with our wheat, which means there's a lot of straw on the ground," Dean says. "The cover crops increase the soil microbes, which

helps break that straw down quickly so we don't have residue problems.

"Our soil tilth is really nice and we get good emergence with our beans,"

Beck notes that cover crops also are a great way to fix or recycle some extra nitrogen and can provide forage for producers wanting to integrate crop and livestock production.

Adjust Seeding Rates

While many may advise against planting no-till wheat into corn stubble, Herbek says it can be done successfully with a few adjustments.

"Corn residue is one of the biggest challenges for no-tilling wheat," Herbek says. "Generally, you will get a thinner wheat stand with no-till compared to tillage, but it isn't enough to hurt the overall yield potential of the crop."

He says that to make up for skips, wheat plants simply tiller more and put up more heads.

"We've found you can have 20% of an area with skips without hurting yields as long as there aren't a lot of long skips in a single row," Herbek says. "However, we do recommend using a 10% higher seeding rate when no-tilling wheat into corn stubble to make sure the stand is adequate."

As with all no-till, Herbek notes that residue management remains important to achieving good stands.

"Depth control can be a challenge due to uneven residue distribution. So, preparation really starts with the harvest of the corn crop. Make sure to spread the residue as evenly as possible," Herbek says.

Increased disease pressure is another concern for no-tillers following corn with wheat.

"There's always concern with scab because it can move from corn

"One of the greatest things about planting wheat is that it allows us to make field improvements after harvest..."

residue into wheat," Herbek says. "But we didn't find a significant increase in head scab in the no-till versus tilled wheat."

"To have a scab outbreak, you need to have the perfect triangle of host, ideal weather conditions and susceptible varieties. Those factors are more important than residue, so we didn't see much difference."

Beck, however, does not recommend planting wheat into corn stubble due to head scab risks. He suggests leaving a 2-year break between corn and wheat.