

Strip-Till Farmer

The No. 1 Source For Strip-Till Practices And Equipment



Finding The Right Fit With Fertility

By Dan Zinkand

One reason growers are turning to strip-till is so they can place nutrients in the soil where plants need them.

For example, by strip-tilling and banding fertilizer, corn growers can place phosphorus and potassium down where the roots will reach them at V6 to V8.

“Ideally, you want the plant roots to chase the nutrients down in the soil,” says Dan Froehlich, agronomist for Ostara Nutrient Recovery Technologies. “When fertilizer is broadcast, the roots tend to stay on top. That’s fine, if there’s plenty of moisture there.

“But if you put the nutrients down far enough, the roots will proliferate there. If you can drive the roots down, you will help the plant survive and thrive if it turns hot in the summer.

“But experts say growers shouldn’t make assumptions. The old rule of thumb about banding fertilizer, instead of broadcasting, was that rates could be reduced by 30% to 50%, Froehlich notes.

“With today’s corn yields, that’s just not the case,” he says. “Farmers are fertilizing at the same rates now as they did when corn yields were 30 bushels less per acre.”

Tips For Banding Nutrients

Banding nutrients may enable strip-tillers to gain application efficiencies, says Tony Vyn, a Purdue University agronomist. But growers must not make decisions in a vacuum.

“Don’t assume that you will have an overall reduction in long-term phosphorus and potash requirements in strip-till,” Vyn says. “You will probably be able to apply less phosphorus and potash with strip-till than by broadcasting it. But you still have to meet the nutrient requirements for crops, and phosphorus and potassium removed by the grain needs to be replaced.

“Banding nitrogen and phosphorus does provide flexibility, as strip-tillers are less dependent on applying starter with the corn planter, Vyn adds.

“For maximum starter benefit with strip-till, phosphorus banding should not exceed 3 to 5 inches deep in the fall,” he says. “For nitrogen, it depends on the form, rate and timing. Strip-tillers should only apply anhydrous ammonia in the fall, when the depth really doesn’t matter.”

Spring Strip-Till Cautions

Strip-tillers using anhydrous ammonia in the spring should place it at least 7 inches deep, Vyn says.

There are two exceptions to this rule: The first is the anhydrous is placed at least 3 inches away, in an offset manner, before the radical roots reach the anhydrous zone. The second is that there are at least 2 weeks or 1 to 2 inches of rain between the application of anhydrous and planting corn.



NUTRIENT EFFICIENCIES. Strip-tilling allows corn growers to gain nutrient efficiencies, says Doug Wittmeier, sales agronomist for Northern Plains CHS in Faulkton, S.D. Wittmeier’s strip-till farmers are using 0.9 pounds of nitrogen per bushel of corn in strip-till vs. 1.2 pounds of nitrogen per bushel for spreading fertilizer on the soil surface.

Vyn stresses that these recommendations depend on which form of nitrogen — anhydrous, UAN or Urea— strip-tillers select, as well as the depth of placement.

"In the spring, all of these forms of nitrogen could be pre-plant applied in the intended corn-row areas — even as shallow as 5 inches deep — if less than 75 pounds of actual nitrogen is applied per acre," he says. "However, at 100 pounds of actual nitrogen per acre applied in the spring, pre-plant and in the row zone, the deeper the fertilizer is placed, the better."

Strip-tilling corn in the spring involves trade-offs. "In a much wetter environment, you may be losing some opportunity for enhanced root growth in corn due to smearing and clodding," Vyn says. "I am very nervous about spring strip-till for corn, with in-row placement of high rates of nitrogen — especially anhydrous and urea.

"If a strip-tiller is applying 100 to 200 pounds of UAN on 30-inch spacing, it should be placed 5 inches to the side of where the corn will be planted. Placing this rate of UAN 5 inches below where the corn is planted might be OK."

Froehlich shares Vyn's concerns about strip-tilling corn in the spring. He prefers fall strip-till for corn.

"You can't strip-till as deep in the spring as you can in the fall," he says. "We'd love to see farmers strip-till 6 to 8 inches deep in the spring, but in reality, it ends up being more like 4 or 5 inches because of the moisture levels. If corn growers plant more than 1½ inches deep, then there's a risk of seedlings burning with shallow-placed fertilizer.

"And what do you do if you planned on strip-tilling and there's a wet spring? "With spring strip-till, it really shortens up your window," Froehlich adds. "Strip-till in the fall and at least get your phosphate and potash applied."

Move Phosphorus, Potash

For many strip-tillers, the system's attraction includes putting fertilizer where it can be easily accessed by the crop's roots. But applying fertilizer in a band may be too concentrated, Vyn says.

"There are some benefits of mixing fertilizer in the soil," he says. "But in my experience, continued deep-banding phosphorus and potassium using RTK in the same root zone — applying a 2-year, crop-removal rate before corn — is not as effective, yield-wise, for a multiyear strip-till corn and no-till soybean sequence as broadcasting the fertilizer is."

Strip-tilling and deep-banding of phosphorus and potash is ideal from an environmental perspective, Vyn says.

One option is to deep-band all of the phosphorus, but broadcast at least some of the potash. The other option, especially for potash, is to move the deep-band position regularly to try to achieve a more uniform soil distribution of potassium.

"For example, move phosphorus and potash 10 to 15 inches to the side of where the corn was planted last, if you're only deep-banding," Vyn says. "This is especially true for phosphorus. You need to move the zone, or it will be less efficient."

Insight From The Fields

Defiance, Ohio, strip-tiller John Rethmel, his father, Bob, and his uncle Don Rethmel have strip-tilled for 7 years. Rethmel studies strip-till research results from Ohio State University and works with crop consultant Joe Nester of Nester Ag in Bryan, Ohio.

"We've been testing reducing rates of phosphorus and potassium by about 33%," Rethmel says. "At this point, we feel it's fine, but I think we need more time to evaluate this.

"We don't apply very much nitrogen with the strip-tiller and haven't really changed our nitrogen management as a direct result of strip-tilling. We're pretty new at this, so we are watching this carefully.

"We have a few fields where we have fertilizer plots — cutting rates vs. not cutting them — because we want to see what we should and should not be doing. In our area, there are a lot of low-productivity soils. The majority of the land we farm is extremely heavy clay.

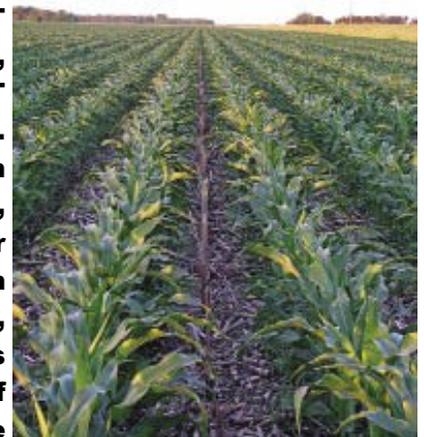
"For the last 3 years, the Rethmels have been applying fertilizer while strip-tilling with their 12-row Orthman 1tRIPr. Before buying the Orthman rig, which carries and mixes fertilizer, they used a different rig and were not placing fertilizer in the strip in the fall.

"You must meet the nutrient requirements for crops, and phosphorus and potassium removed via the grain needs to be re-placed..."

—Tony Vyn, Purdue University



RIGHT PLACE, RIGHT TIME. Carson Klosterman, a strip-tiller from Wyndemere, N.D., places fertilizer off



and to the side of the strip — usually a 2-by-3-inch placement when he's planting corn. "I like putting the fertilizer that the plant needs close by, and we're seeing some efficiencies from that," he says.

"We put on a blend of DAP, potash and AMS," Rethmel says. "The 1tRIPr mixes the DAP with the soil. If you dig down into the strip, it's hard to find a real concentrated band of fertilizer. We pull the shank 6 to 7 inches deep and the fertilizer goes 3 to 4 inches deep.

"It's all variable-rate applied. We based the rate off yield zones we've developed with Joe. We use RTK when strip-tilling and planting. With RTK, we have the opportunity to move the strip with the band of fertilizer over and plant into it in the spring.

"Yields of strip-tilled corn vs. no-tilled corn have been pretty variable. "It really depends on the spring and how cold and wet it is," Rethmel says. "But we are pleased with strip-tilling our corn."

Cut Rates Carefully

Since Brandon Grubbs began strip-tilling 8 years ago, the Piper City, Ill., corn-and-soybean grower has cut back on phosphorus. But he cautions growers about cutting nitrogen and potash.

"We're still looking carefully at cutting potash," he says.

"While you can cut back some on your fertilizer program, I wouldn't chop everything 50% or more and then go 6 years between soil tests.

"He strip-tills about 80% of his corn using a 12-row Twin Diamond Strip-Cat. He does custom fertilizer and crop-protection application and custom strip-tilling.

When planting corn, Grubbs applies 90 pounds of UAN per acre, then sidedresses 28% liquid nitrogen for the balance of his nitrogen program.

In 2010, Grubbs harvested 230-bushel-per-acre, strip-tilled corn. He doesn't skimp on applying nitrogen for corn.

"We're probably using higher nitrogen rates than most farmers because of our yield goals," he says. "For strip-tilling corn-on-corn, we increase nitrogen by 15 pounds per acre over what we normally use for corn that has been worked with tillage equipment. We increase the nitrogen on those acres by 30 pounds per acre. But we don't increase nitrogen rates 30 pounds per acre for corn after soybeans.

"Most strip-tillers can cut back a little bit on fertilizer, but don't cut back a huge amount until you see how your ground responds.

"After harvesting corn, Grubbs sprays corn stalks with 20 to 30 gallons per acre of 6-0-0-8. Twenty-five gallons of liquid AMS equals 100 pounds of dry AMS. He sprays the AMS 2 to 4 weeks before strip-tilling in the fall.

"Because it's liquid, we can cover all of the residue," Grubbs says. "It's really evident in the spring where you applied liquid AMS to the corn stalks. You end up with a lot less residue.

"When strip-tilling, Grubbs applies DAP, phosphorus and AMS using variable-rate technology. The range is 100 to 125 pounds per acre of DAP; 25 to 100 pounds per acre of potash; and about 25 pounds per acre of AMS in a band.

"The balance is made up using a spinner-spreader with variable-rate technology to fill in the low spots," he says. "The variable-rate recommendations are made taking previously applied material into account.

Grubbs uses a base blend of all three products, depending on whether it's corn following soybeans or corn on corn. He doesn't want to apply a large amount of potash in a band in the fall because the sandier soils won't hold it well.

"You've got to be broadcasting some of the potash," Grubbs says.

"Maintaining potash levels is tough. We aim for 350 parts-per-million (ppm) potassium and 60 ppm on phosphorus.

"Since we started banding our fertilizer with strip-till in 2006, our phosphorus levels have skyrocketed, even though we're putting on less than maintenance rates in our strip-tilled corn-on-corn.

"Potassium levels aren't as good as Grubbs would like in his corn-soybean rotation. As a result, he may have to broadcast more phosphorus in soybeans to increase the phosphorus levels.

"In the last 4 years in the continuous corn that we've strip-tilled and banded fertilizer, it's been amazing how fast the phosphorus levels have increased,



"Most strip-tillers can cut back a little bit on fertilizer, but don't cut back a huge amount until you see how your ground responds..." — Brandon Grubbs



"We have a few fields where we have fertilizer plots — cutting rates vs. not cutting them — because we want to see what we should and should not be doing..." —John Rethmel

Grubbs says. “For corn following soybeans and corn on corn, we place the fertilizer 6 to 7 inches deep. Grubbs uses a knife for fall strip-till and coulters in the spring. “Everything we do with our strip-till fertility program is based on 15-inch skips,” he says. “Every year, we move the fertilizer band over 15 inches from the previous placement. Grubbs relies on skip placement for two reasons. “First, we want to spread the band of fertilizer so it’s not in the same place every year,” he says. “Second, especially in continuous corn, you’re fighting residue from the old corn rows. You can plant into a lot of residue in the spring, but it’s difficult to strip into heavy residue in the fall.”

Spring Strip-Till Works

Carson Klosterman of Wyndemere, N.D., started strip-tilling in fall 2007 to lower inputs, reduce tillage trips and control his fertilizer application.

“I wanted to control my own fertility program instead of having it spread,” Klosterman says, “I also wanted to improve the organic matter on our sandy ground.

“Because of wet fall weather in the past few years, Klosterman has been strip-tilling in the spring. He uses a Dawn Pluri-bus strip-till rig.

His farm has strip-tilled corn, soybeans and sugarbeets, and most of his acres are corn and soybeans.

“Fertilizer is placed off and to the side of the strip, usually a 2-by-3-inch placement when I’m planting corn 2 inches deep,” Klosterman says. “I like putting the fertilizer that the plant needs close by and we’re seeing some efficiencies from that.

Klosterman also moves the strip with fertilizer back and forth 15 inches every year.

“We’re using less nitrogen, phosphate and potash with strip-till,” he says. “I’d say we’re saving 30% or more on phosphate and potash, while still keeping the soil levels up.

“I’ve also seen that precision-placed nitrogen is allowing us to grow more bushels of corn with less nitrogen. In some instances, 0.6 pounds of nitrogen per bushel.

Klosterman adds that he’s done a liquid program the last couple of years — 30 to 40 gallons of 28% nitrogen per acre; 10 gallons of 10-34-0; and 3 gallons of Conklin SideKick, along with Guardian nitrogen stabilizer.

Then he puts down a starter with the planter consisting of 4 to 6 gallons per acre of 3-18-18, a SideKick mix, along with zinc, manganese and sugar in-furrow. Klosterman sidedresses a mixture of 28%, SideKick (for late-season potassium and sulfur) and micronutrients as needed.

Klosterman bands crop-removal rates to feed the crop.

“We’re not applying less than what’s needed, so the fertility level of the fields is still the same to higher,” Klosterman says. “That’s due to higher organic matter — the ultimate goal.”

Strip-Tilling 22-Inch Corn

While Klosterman strip-tills in the spring, Langford, S.D., strip-tiller Joel Erickson prefers the fall.

Erickson, who began strip-tilling about 15 years ago, uses a 16-row DMI applicator toolbar with 22-inch row spacing. He grows corn, soybeans and spring wheat and typically strip-tills corn after soybeans or wheat.

Erickson’s strip-till rig has cutting coulters in front of spring-loaded knives, followed by sealing discs. He puts on anhydrous ammonia and pulls an air cart to apply a blend of phosphorus, potash and zinc sulfate.

“I put the fertilizer as deep as I can,” Erickson says. “If I can get the fertilizer down to 6 or 7 inches, traveling up to 5 mph with my 330-horsepower tractor, that’s great.

“The local co-op strip-tills with a 500- to 600-horsepower tractor, traveling 7 to 8 mph, and gets the fertilizer down 8 to 9 inches.

“Erickson believes he uses about the same amount of fertilizer for corn since he began strip-tilling because he does variable-rate application based on management zones.

“I’m probably using less phosphate because of strip-till and variable-rate application,” he says. “I apply more fertilizer on the really good ground. On the alkali or low-producing areas, we’re putting lower rates of phosphate or sometimes no phosphate at all.

“Using 22-inch rows limits the fertilizer attachments that Erickson can use on his corn planter.

“I put on liquid 10-34-0 and zinc as pop-up with the seed, trying to get the corn up a bit quicker,” he says.



“I like putting the fertilizer that the plant needs close by and we’re seeing some efficiencies from that...”

—Carson Klosterman

Advice From Agronomists

Mark Biedenfeld, agronomy sales manager for Northern Plains' CHS Service Center, based in Gettysburg, S.D., says adoption of strip-till is increasing in the company's seven-location trade area, including south-central North Dakota and north-central and western South Dakota.

"All of the strip-till is being done in the fall for corn planted the following spring," Biedenfeld says. "The co-op does custom strip-tilling in the fall, using a knife or shank to place nutrients. In many cases, coulters and trash whippers are used on the toolbar, ahead of the knife or shank."

Strip-tillers are placing nitrogen, phosphate, potash, sulfur and zinc in their fertility programs, he says. The majority of the nitrogen is anhydrous ammonia and is placed 6 to 8 inches deep. The other nutrients are placed about 4 inches deep.

There are nutrient efficiencies to be gained with strip-till, adds Doug Wittmeier, sales agronomist at the Northern Plains' service center in Faulkton, S.D. His strip-till corn farmers are using 0.9 pounds of nitrogen per bushel of corn in strip-till vs. 1.2 pounds of nitrogen per bushel for spreading fertilizer on top of the soil.

Wittmeier says strip-tilling corn has increased yields 10 bushels or more per acre, which more than offsets the increased application costs, amounting to 2 to 3 bushels per acre based upon current production estimates.

"For growers in north central South Dakota who have been strictly no-till," he says, "one of the indirect benefits they can reap from deep-banding fertilizer is from the fracturing of the hardpan that isn't being removed by other natural processes."

Courtesy of Lessiter Publications ~ www.striptillfarmer.com