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2011 Recipients
Jeff Garman, Colfax, Ill.
Larry Bonnell, Pittsford, Mich.
Jordan Bennett, Hermiston, Ore.

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No-Tiller Makes Sure Corn Has A Good Drink Of Fertilizer Ready

Having proper fertilizer levels available to corn
5 inches tall just one of the fertility keys for Illinois no-tiller.

By Dan Zinkand

TWENTY YEARS OF no-tilling have convinced Colfax, Ill., farmer Jeff Garman of the importance of creating a clean seedbed for corn and precisely placing nitrogen and other valuable nutrients so they are readily available for the corn seedling roots.

“When the corn is about 5 inches tall, that’s when the girth and the length of the ears are determined,” Garman says. “My goal is to have plenty of nutrients readily available for the corn to ‘sip’ off of.”

“In addition to nitrogen, I use zinc and boron pretty religiously. I also have included manganese.”

At planting, Garman applies about half of the nutrients corn needs. By doing this, he doesn’t need to be in a big hurry to sidedress corn.

When the corn is about 18 inches tall, he sidedresses about 20 gallons per acre or more of 32% liquid nitrogen using a coulter-knife rig.

“I’m very aware of the nutrients that it takes to grow good corn and soybean yields,” Garman says. “I’m trying to get the most out of the nutrients, without putting down more than the crops need.”

Feed The Seedlings. Garman’s Kinze 3000 “splitter” planter — 12-row, 30-inch spacings for corn; 23-row, 15-inch spacings for soybeans — features Kinze row cleaners, as well as Martin spader wheels and drag chains that Garman added for planting corn.

“I designed a fertilizer attachment that bolts onto the row units of my Kinze planter,” he says. “It places the liquid fertilizer after the gauge wheels but before the ‘V’ press wheels. The fertilizer is placed about 3 inches out on both sides of the seed trench, and about 1 1/2 inches deep.

“This accurately places the fertilizer right near the plant roots for convenient and rapid uptake. Because of the close placement, the roots do not have to hunt for their next meal.”

Garman no-tills 800 acres in about a 50-50 corn-soybean rotation. He soil tests each field every 4 years.

In most years, his yields exceed the county average, especially in dry years.

He attributes that to the heavy soils and the moisture conserved by the protective residue from 15 years of continuously no-tilling corn and soybeans.

Reaching the right system for no-tilling and fertilizing corn took time.

“The first year I no-tilled my corn in 1991, nothing could go wrong,” Garman says. “But that second year, the no-tilled corn was 25 to 30 bushels per acre less than my conventionally tilled corn.

But I wasn’t going to quit. I knew I had a lot to learn, so I decided to make my IH 900 planter work better.

“I added row cleaners and began using starter fertilizer. My yields didn’t start to pull even with conventionally tilled corn until I began putting down a good dose of 28% or 32% liquid nitrogen, as well as when I started using my Kinze 3000 planter. The Kinze row cleaners clear a path about 11 inches wide. That makes a nice, trash-free black strip of soil.”

Garman has compared the temperature of this strip in his no-tilled cornfields with those in neighboring conventionally tilled cornfields, with both fields planted the same day.

On the day of planting, the no-tilled field soil temperature may be 8 to 9 F cooler.

But early the next afternoon at a 2-inch depth, Garman’s no-tilled soil in the black, 11-inch-wide strip will be within 1 or 2 F of the neighboring conventionally tilled fields.

“I like to put most of the phosphorus on with the planter in liquid form,” Garman says. “I may also use 18-46-0 or 11-52-0, depending on what the soil test indicates.

“I broadcast potash with my 8-ton fertilizer buggy. I apply all of my fertilizer, but have lime custom applied.”

Sidedress And Topdress. Over the years, Garman’s reduced the amount of high-salt commodity fertilizer he applies. Dry potash is the highest salt-content fertilizer he puts on.

Garman uses all liquid-starter fertilizer, applying 11-37-0, 32%, Thio-Sul and zinc.


Depending on the soil-test results, Garman may include about 5 gallons per acre of Thio-Sul, along with some zinc, boron and manganese.

“For sidedressing, I never use anhydrous ammonia,” Garman says. “A lot of times when I’m sidedressing, I will put in 2 to 3 gallons per acre of Thio-Sul.

“I’ve used Agrotain and N-Serve, but I prefer Thio-Sul. It has the advantage of having sulfur and it stabilizes the nitrogen.”

Garman has had success topdressing corn, although it’s not something he does every year.

Depending on the potential for an excellent corn crop and/or weather conditions that could cause leaching of nitrogen, he topdresses corn about a week before the corn tassels. Garman uses a Hagie high-boy sprayer that has 25 drops, each about 28 inches long.

“I lower the booms to keep the tips of the drops about a foot off the ground,” Garman says. “In some years, topdressing corn has increased yields by 10 to 15 bushels per acre.” 

“My goal is to have plenty of nutrients readily available for the corn to ‘sip’ off of...”

Hitting The Spot With Fertilizer

Strip-tiller finds corn yields take a healthy jump — while fertilizer rates and costs decrease — by placing nutrients with precision.

By Dan Zinkand

JORDAN BENNETT LIKES strip-till for the time and money it saves, the crop residue it leaves to protect sandy soils from blowing and for the water it conserves. But the Hermiston, Ore., strip-tiller loves the precise, efficient fertilizer placement of his one-pass strip-tilling and planting system.

“Strip-tilling and precisely placing fertilizer just makes sense,” Bennett says. “The strip-till tools are expensive, but I save so much money, water, time and equipment by strip-tilling my row crops.”

One-Pass System. Bennett began strip-tilling in 2008 when he bought an eight- and 12-row Orthman 1tRIPr. He uses a John Deere 1720 CCS MaxEmerge 12-row planter on 30-inch spacings.

The strip-tiller grows 800 acres of corn for grain and custom farms 3,000 acres of corn with the one-pass, strip-till fertilizing and planting system.

“Depending on the field, the previous crop and the soil type, I’m shooting for less than 1 pound of nitrogen per bushel of corn,” he says. “We can grow 300-bushel corn here in the Columbia River Basin, but you’ve got to put water on the crops, whether it’s corn, hay, wheat or vegetables.”

“Wind erosion is a serious problem in the Columbia River Basin, where soils mainly consist of blow sand,” Bennett says. “I strip-till corn to minimize wind erosion. I band liquid fertilizer with my no-till corn planter to maximize the efficient use of the fertilizer.”

Bennett leases ground that’s irrigated by center pivots, no-tilling corn into the residue of previous crops. The typical rotation in the area is potato-wheat-corn-corn-potato. He also strip-tills and plants into the stubble of alfalfa, winter wheat, sweet peas and other vegetable crops.

Sees Better Yields. “I do tillage, planting and fertilizing in one-pass, using an Orthman 1tRIPr and a no-till planter,” Bennett says. “The 1tRIPr has ripper shanks, which break up compaction when I no-till corn. The planter variable-rate applies the fertilizer.”

“I have a complete soil test taken before planting. The fertilizer that’s applied in the planter band is custom-blended, based on the results of the soil tests. Also, during the growing season, three complete leaf tests are taken between V5 and silking. Any nutrients that are needed are then applied through the center-pivot irrigation system.”

At silking, Bennett says a soil nitrogen test is also taken with the leaf sample. This testing program allows him to use less fertilizer, as he only applies what the crop needs.

“Corn yields increase when the soil fertility is in balance,” he adds.

The average yield for corn that’s conventionally tilled in

Umatilla County is 250 bushels per acre. Bennett’s strip-tilled corn averages 310 bushels per acre.

With the corn planter, liquid fertilizer is banded at 3 gallons per acre with a 9-24-3 solution of Pro-Germinator, along with 4 gallons per acre of Sure-K (2-1-6), 3 gallons per acre of High NRG-N (24-0-0), 0.25 gallons per acre of Micro 500 and 0.25 gallons per acre of 3% LiberateCa (calcium).

During the growing season, approximately 40 gallons per acre of 27-0-0-1 High NRG-N is applied, along with 0.25 gallons per acre of 5% boron.

“These amounts vary from field to field, based on the results of soil fertilizer tests,” Bennett notes.

If 32% UAN is applied, Bennett also uses eNhanse, which Bennett says stabilizes the free ammonia and improves nitrogen uptake from the corn.

“Most of the low-salt liquid phosphorus, potassium and micronutrients are applied in-furrow at planting with Keeton seed firmers,” Bennett says. “A low-salt nitrogen is applied, too, at a low rate in the furrow.”



“Corn yields increase when soil fertility is in balance...”
— Jordan Bennett

“If the soil test results indicate that more than 10 pounds per acre of nitrogen are needed, it’s placed 2 inches below the seed.”

Fertilizing Precisely. Bennett uses micronutrients, applying them in the band with the planter. These nutrients and their rates are based upon the pre-plant soil test.

“When the in-season soil test and leaf-tissue tests indicate that nutrients are needed, they are usually injected with the water put on by the center pivot or in a foliar application,” he says.

Bennett uses RTK on his John Deere 8430 tractor for strip-tilling and planting in one pass. He has auto-steer for his combine and makes yield maps to identify areas where fertilizer, sprinkler compaction and water issues need attention.

Bennett sometimes plants triticale as a cover crop after the fall crop is harvested. In the spring, triticale is green-chopped for feed. This double-crop system works well and it stops erosion.

He also plants fertilizer test plots for research, along with hybrid trials.

Overall, Bennett’s quite pleased with strip-tilling corn and how it works with his fertilizer management program.

“Our yields have been better with strip-till than they were with conventional tillage,” Bennett says. “It’s a matter of efficiently using water and placing fertilizer where the seed needs it. With broadcasting fertilizer, you hope the seed gets to it.”

Small-Acreage No-Tiller Uses Many Fertility Tools

Cover crops, waste sludge, gypsum and pelletized lime helping Michigan farmer increase yields and improve profitability.

By Darrell Bruggink, Executive Editor

LARRY BONNELL IS living proof that no-till is the ideal tool for small-acreage farmers.

“You always hear about no-till helping a guy be more efficient and allowing him to increase his cropping acres,” the Pittsford, Mich., no-tiller says. “But I think it’s for the smaller guy. I think the only way a smaller guy can farm profitably is with no-till.

“I’m a sold believer.”

And while his acreage is relatively unchanged since he began no-tilling about 8 years ago, the quality of his farming techniques has vastly improved, Bonnell says.

Between no-till, cover crops, the use of sludge in wheat stubble and the addition of gypsum and micronutrients, Bonnell has seen



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— Larry Bonnell

organic matter on some of his fields increase from 1.7 to 2.9.

While most of his ground is in a corn-soybean rotation, Bonnell typically grows about 20 acres of winter wheat after soybeans, which acts both as a cover and cash crop.

Cover Crops. Bonnell typically seeds cereal rye with a fertilizer spreader after corn and prior to planting soybeans. Annual ryegrass is his primary cover crop ahead of corn. He grows cover crops on about 50% of his no-till acreage.

He recently began mixing legumes like hairy vetch and Austrian peas with cereal rye and annual ryegrass, and included tillage radish in the cover-crop mix last fall.

“With the legumes, I get the benefit of putting down nitrogen and then holding that nitrogen with the ryegrass,” Bonnell says. “I’ve noticed a difference in my soil. It’s changing — getting mellowier.

“It’s workable. I don’t have the clay knobs we used to get where the tractor would stick.”

He’s also worked with alsike clover because of its large tap root and added dwarf Essex rape as plot food to attract deer and turkey.

Adds Sludge. After harvesting wheat, Bonnell has worked with Synagro to apply human waste sludge to stubble as an inexpensive source of nutrients. Light chiseling is needed to get waste in the soil and eliminate odor concerns. Other than fixing ruts, this

is the only time he touches fields with a chisel.

“If I had another way to apply this, I would, but it doesn’t cost me anything so I can’t give it up. While it’s low in potassium, it’s high in nitrogen and phosphorus,” he says.

After application, he waits 10 days before incorporating the sludge.

“It’s preferable, if you can get a little bit of rain to help it percolate down,” says Bonnell, who then plants a cover crop of ryegrass and a legume into wheat stubble to capture the nutrients from the sludge.

Bonnell conducts soil tests every 3 years and noticed that his phosphorus and potassium levels are increasing even though he’s decreased the amount of applied fertilizer. He uses NutriSphere-N to stabilize urea and Avail to protect phosphorus.

His no-till corn fertilization program generally consists of 150 pounds of 11-52-0. Micronutrients are applied per soil testing. He limits potash applications to 60 pounds per acre. Dry starter fertilizer is applied in a 2-by-2-inch placement.

Gypsum And Lime. With no-till, he has seen corn yields run up to 180 bushels per acre, whereas the Hillsdale County average is about 125 bushels per acre.

Gypsum has dramatically improved the structure of his clay soils, Bonnell says.

“I’ve use it on hard soils and I think there’s a place for it in farming if the price isn’t too high, especially here in our heavy clay ground,” he says. “I had places where I couldn’t get a crop in some years because heavy rains would drown out the crop. I’ve used 100 pounds of gypsum in those areas and the rain percolates through it.

“I’ll use it to take care of wet spots and I’ll use a little on hills where there’s heavy clay.”

Pelletized lime, along with a starter for soybeans, has helped Bonnell raise his soybean yields to about 50 bushels per acre and occasional 70-bushel yields.

“The main reason for pelletized lime is it sweetens the soil right up. The beans seem to love pelletized lime,” he says. “I like to keep the pH about 6.8. It goes into the ground real fast and the benefit is there quickly.”

No-Till Forever. Bonnell says the benefits he’s seen from going to no-till have convinced him that he wants to see his farmland no-tilled even after he’s no longer farming that ground.

“I only run 300 acres, but my whole theory is that if I ever quit farming, there will be no full tillage on my farm,” he says. “Everything will be no-tilled.”

