



What I've
Learned From
No-Tilling...

Father-Son Team Aims To Thrive, Not Survive

Bob Bottens and his son, Monte, combine their diverse talents to tackle water and technology challenges and turn highly erodible soils into productive no-till fields.

*By Bob and Monte Bottens
As interviewed by Martha Mintz*

Monte: ‘Moonlight Farmer’ was my dad’s radio handle at the Case IH dealership in Cambridge, Ill., where he worked as a diesel mechanic. He farmed about 80 acres when he wasn’t at his day job.

Gradually, he progressed in both his careers, partnering into ownership of a dealership and bumping his farm to 640 acres.

Once I graduated college, I also worked for the dealership, serving as manager of one of three locations. When Dad sold the dealership in 1999, we both started farming full time.

I borrowed equipment from Dad to get into farming. It was a great way to help me get started, but he said if I found too many acres, I’d have to pay for trading in the equipment.

Of course, I eventually ended up with too many acres — about 1,000 — and had to chip in. But at that point, we were no-tilling, so there wasn’t as much equipment to deal with.

Bob: I’d seen no-till in the 1960s when people were first trying it, but it didn’t seem to work well. In the late 1990s, however, it seemed the right combination of chemicals and equipment was in place to make it really work.

FATHER-SON TEAM. Bob Bottens (right) and his son, Monte, feed off each other’s talents. Bob records harvest numbers and assembles worksheets and crop reports, and Monte uses the data to make decisions on nutrient programs. “We’re intrigued by the data out there, and how we can use it. And it’s nice to have two heads to think over the possibilities,” Monte says.

We went 100% no-till in 1996, at least our version of it. With two coulters on the planter, we were doing far more tillage than we would ever dream of now.

Over time, our system has evolved and the changes we make have as much to do with profitability as they do no-till. It’s a mindset. We don’t just want to survive while no-tilling. We want to prosper.

INTELLIGENT VARIABLE RATE

Bob: Being in the equipment business, we were exposed to all the latest technologies and often ended up with them installed in our own farm equipment. We’ve had variable-rate technology and yield mapping for 16 years.

Monte: We prided ourselves on being a forward-thinking dealership in the area of technology, and Dad has a real knack for it. He can get around GIS computers better than me, but can’t work his smart phone.

We varied fertility rates and populations, but didn’t really know what we were doing. We would just try it and see what happened.

Dad was skeptical and would ask, again and again, on what information were we basing the application rates. It was an

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old trick he used on his managers at the dealership when they came to him with a problem. He wanted them — and in this case, me — to come up with solutions ourselves.

The answer I came up with was to take everything back to even. We needed to remove all the variables so we could see what we were truly dealing with and establish a baseline.

Variables were eliminated by planting one hybrid per field with uniform fertilizer and nutrient applications for 5 to 6 years. In that time, we were able to build a database of high- and low-performing areas. Now,





Check The Specs...

NAME: Bob and Monte Bottens
LOCATION: Cambridge, Ill.
YEARS NO-TILLING: 16
ACRES: 1,875 acres
CROPS: Corn, soybeans

SPLIT DECISION. The Bottens do split nitrogen applications to feed crops in a timely manner. Cutting a thin slot (inset) for nitrogen application with a 30-foot sidedress toolbar, mounted on a Miller high-clearance sprayer, limits the amount of washing and dirt movement, which is crucial for no-tilling the hills and highly erodible ground on their farm.

we can go back and intelligently vary populations, hybrids and fertility. We had to go back to simple so we could move forward with technology.

Bob: Too many assumptions are made in farming. All the variables affect yield and you need to know why. You have to keep track of everything you do in the field.

In 1999 and 2000, we varied the population of our soybeans. Looking at the maps, yield was down in some areas and I kind of forgot about the population changes. I thought it was soil type, but in reality we had pushed the population too far. I didn't remember that change initially, and it was a good lesson to remember: Pay attention to the variables.

PUTTING DATA TO WORK

Monte: The No. 1 yield factor on our farm is plant-available water. The ability of soil to deliver water to the plant is a function of infiltration rate, storage and cation release of capillary water. Our new variable-rate plans will be based largely on plant-available water capacity as determined by yields.

By using steady rates of fertility, population and hybrids over multiple years, we've watched how yields vary throughout the fields over time. This gradually outlined some distinct production zones in our fields.

Getting data from multiple years of uniformity was essential, as this is data we'll probably use forever. The numbers had to be truly representative of what the fields could produce and give us a solid baseline to work from.

Bob: Prior to setting this baseline, we also spent years addressing soil health. No-till management and our tile-drainage

system had been in place long enough that water is effectively managed.

All of our acres are pattern tilled, which serves several purposes. Tiling allows our field to manage 1½- to 2-inch rain events without washing, and it drains so fields aren't flooded and crops and micro-organisms aren't drowned out.

No-till, residue and addressing calcium-magnesium ratios have further helped to make our soils more like sponges than bricks.

Monte: From our data, we've created yield-based zones that will replace soil-type zones for our soil-testing protocols. We've never done grid sampling because it just

Our goal isn't to make the entire field yield the same — but rather to make the most out of every acre...

didn't make sense. It actually creates more variability and leaves farmer observation out of the equation.

In our situation — and we know this may vary in other parts of the country — we've found from soil testing that our phosphorus and potassium levels on top-producing ground seems to be optimum already.

As we head into our rebooted variable-rate program, we'll likely reduce the application rates of phosphorus and potassium in those areas, but increase population and nitrogen applications.

Sidehills have proven to have the least water-holding capacity, so we will reduce nitrogen and population there. They're also deficient in phosphorus and potassium due to long-eroded topsoil, so those levels will

be increased through variable-rate applications. We're still working on how sulfur fits in the equation.

MIXING IT UP

Monte: This winter we are installing an onboard fertilizer mixing system for the planter so we can customize and blend our rates on the go.

A Trimble controller will use a prescription map to draw from tanks containing 4-10-10, Thio-Sul and UAN 32, creating the mix on the go. The system is very fast and can change rates every second if it's needed. I'm very excited to see the system at work.

Bob: I'm not as excited (laughs). In our operation, I am responsible for all the field-work and marketing, while Monte makes all the production-related placement decisions.

He selects the hybrids, determines fertilizer rates and products, and I get them in the field. Sometimes his ideas create more work or hassle for me, but they usually produce results that we love to have.

Monte: I actually run my own consulting and fertilizer-sales business in California's Central Valley. If I come out and try to do much in the field in Illinois, I'm just in Dad's way. He does the day-to-day activities of putting together the worksheets and reports and I use them to make decisions.

He sees every acre at harvest and reports the yield by number and field. We don't guess and don't report our yields by what the monitor reads in the best part of the field. We take the whole field to town, not just a plot.

We rely heavily on our seed man and his agronomist for hybrid recommendations.

I think the person who sees 1,000 fields per year knows how his hybrid will perform better than I can guess. We send them our general farm characteristics, yield, etc., and then they make recommendations.

But Dad and I always keep excellent



NO STOPPING. The Bottens are installing an onboard fertilizer-mixing system this fall for their 24-row Case IH Early Riser 1250 planter to customize and blend fertilizer rates on the go. A Trimble controller will use a prescription map to draw from tanks containing 4-10-10, Thio-Sul and UAN 32. The setup requires a 400-gallon tank on the planter and 1,300-gallon tank on the tractor, which tows another 2,600-gallon cart.

track of farm data to make sure we're accomplishing our goals.

Dad and I both have our strengths and use them to better our operation. We're intrigued by the data and information out there, and how we can use it. And it's nice to have two heads to think over the possibilities.

FERTILITY PROGRESSION

Bob: One of our ideas — which ended up being more work for me — was when we initially started applying nitrogen with the planter. We'd always used fall-applied anhydrous because we had the equipment

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and it was easy. I really was hoping that applying with the planter wouldn't work because it added an extra hassle at planting.

The field we applied nitrogen to with the planter that year yielded far better than the fields that got anhydrous the previous fall. The next year, we dropped anhydrous and banded all of our nitrogen in 3-by-3-inch placement.

Monte: You might lose 60% of your anhydrous in a wet year, and at \$800 per ton, I don't want to lose any. That's why we decided to start applying nitrogen with the planter, even though it might slow us down.

We use a 9-20-3 orthophosphate starter solution with chelated micronutrients applied below the seed. The micronutrients are necessary to help the plant's roots function, including the absorption of nutrients. Thio-Sul is applied at a 20%-by-volume rate with banded UAN 32, along with Agrotain.

The Thio-Sul acidifies the band where nutrients are placed and keeps the nitrogen in a more plant-available form longer.

Agrotain further reduces nitrogen loss.

We also sidedress nitrogen. Applications are injected with a 30-foot sidedress bar mounted on a Miller high-clearance sprayer. This removes some pressure from the planter and puts nitrogen application even closer to when the plant needs it.

Foliar nitrogen applications at 10 days pre- and post-tassel round out the program.

We've seen yields double in the last 15 years, as well as organic matter increase, and our percent yield increase is generally 15% to 25% more than the county average. Despite slowing down planting and making multiple trips through the field, our biggest inconvenience is figuring out where to store all the grain.

HIGH-TECH PLANTING

Bob: There are more monitors in our tractor cab than most people would put up with. We have the Trimble FmX monitor with RTK auto-pilot for guidance, the Trimble Field-IQ fertilizer-rate controller, and a Case IH monitor for population control and planter folding.

We also have a Precision Planting 20/20 SeedSense monitor for down-force and singulation monitoring, and a monitor for cameras that allows me to observe our Redball fertilizer system's float tubes and watch the row units that are hardest to see from the tractor.

We want to keep our residue managers removing residue gently, not plowing the dirt. You need a bare zone to achieve good depth control and even emergence. Floating residue managers aren't an option on our planter, but the monitors and auto-pilot help me keep a closer watch to make those adjustments as needed.

Monte: We've had the 20/20 SeedSense monitor for 3 years, and traded planters in 2011 so we could get the air system.

Our no-till corn-on-corn can be a challenge for achieving good depth control. But with our new 24-row Case IH Early Riser 1250 planter and the automatic down-force

adjustment, our 2011 corn-on-corn acres were the best on the farm.

The 20/20 monitor gives you loads of information and basically allows you to make as many mistakes as you want to live with. We love it. It gives the operator every piece of information they need, but that information is only helpful if you fix the mistake.

It also allows me to port in from my iPad in California and watch the monitor to see how planting is going in Illinois.

One thing we were doing was driving too fast at times. The SeedSense allows us to monitor that and drive at the right speed for conditions.

We can't get too fast with our current setup, though. To implement our new mixing-on-the-go plan, we have a 400-gallon tank on our planter, tow a 2,600-gallon cart and carry an additional 1,300 gallons on the tractor.

We don't like to stop. This setup allows us to do 72 to 76 acres without stopping. Using tracked equipment and filling tanks only to the maximum of the limiting tank help us avoid compaction.

Bob: Corn plants have the potential to produce 500 to 600 bushels per acre. Our strategy is to reduce the stresses on the plants to get them closer to their potential. We believe we're achieving that through drainage, avoiding compaction, managing the soil and soil micro-organisms, and feeding the plant what it wants, where and when it wants it.

Almost all of our fields are highly erodible, but with no-till we're yielding far more than we're supposed to be able to. The corn-productivity index of our soils in one field ranged from 90 bushels per acre to 150 bushels per acre. But in 2011, that field averaged 213 bushels per acre, in a dry year.

Monte: Our goal isn't to make the entire field yield the same — but rather to make the most out of every acre. We want to push the top-end areas and prevent waste on the low-end areas.

