



DON TILTON

ACCURATE SEEDING. Exapta UniForce hydraulic down pressure on each row unit and an electronic scale on Don Tilton's 1990 John Deere air seeder have helped ensure wheat, cover crops and, more recently, camelina are seeded precisely. The 24-row John Deere 1770 planter also features swath control, air-assist row cleaners and hydraulic closing wheels.

No-Till, Biologicals Save Money on Dryland Acres

Soil testing, cover crops & biological products maximize the nutrients in the soil available to the cash crop

*By Don Tilton
As interviewed by Martha Mintz*

I don't care how many hours it takes as long as it gets done. That's the work strategy that I grew up with and one I think is extremely common in the farming community. We pride ourselves on how hard and how many hours we can work, but at what cost?

Too often we as farmers don't properly value our time, especially when we're younger. With age comes the appreciation that time comes at a cost, and it's a finite resource. Saving my time and improving my quality of life were the driving reasons that I pushed for the move to no-till on our farm in Quinter, Kan. I wanted to work smarter. It didn't seem like living my life on the tractor was a smart use of my time.

Ditching conventional tillage wasn't a unanimous decision. I started no-tilling on my own land, and eventually my dad came around. Now he would have a lot of questions if I hitched onto a tillage implement.

His tune changed because he saw the results. We gained time and became more efficient financially and in the field. As we came to understand the system

and its relation to moisture conservation — the major limiting factor for our dryland western Kansas operation — we did away with fallow resulting in more crop acres. We added even more acres, nearly doubling the operation without increasing labor needs.

The benefits kept coming as we advanced into soil-building practices, such as cover crops, and work to manage inputs to both support and utilize soil life. Some of these efforts have us spending a bit more time in the field again, but this time investment will benefit the future generations who will farm this land.

Invest in Nutrients.

One of the biggest shifts in the operation in recent years has been how we evaluate and provide crop nutrients. Conventional thinking would have us consider and manage crop nutrients like money in a checking account. You make deposits in advance and withdraw as needed. There's little to no interest generated to help build the account balance, and occasionally "fees" — like leeching — result in a loss of

resources without gain.

The more we understand soil health, the more we realize this analogy doesn't fit. Our soil is rich in plant-available nutrients that we didn't deposit, and it can even pay bonus dividends if we manage it correctly.

This was driven home when we conducted Haney soil health testing as part of a CarbonNOW carbon farming program contract with Locus Ag. The 2021 test results indicated there were

plenty of nutrients in the soil to grow our crops. This included zinc and phosphorus (P) — nutrients that traditional soil testing indicated we needed to add. Some of the micronutrients are already plant available. More can be accessed naturally by supporting and building a thriving soil biome.

Continuous no-till worked out to be about a \$50 per acre increase...

No-till, continuous cropping and cover crops provide a strong foundation for soil life. Now we're working to further strengthen their hold and boost what they can provide our crops with biological products. We use Rhizolizer and Pantego biological products from Locus

Ag. Their use is a requirement to qualify for the company's carbon contracts, but they align with our long-term goal of reducing or eliminating synthetic nutrient applications.

The biological products include beneficial bacteria, fungus and phosphate-solubilizing yeast strains. They're purported to increase yields in part by boosting soil microbial activity and transitioning P in the soil into plant-available P crops can use.

We haven't applied any synthetic P since the start of our carbon contract in 2021. Instead, we've relied on the information from the Haney test and biological products. Though drought has made it difficult to get a fair evaluation of crop performance, the shift has already helped our bottom line. We didn't apply any unnecessary synthetic P, and the carbon contract payments more than offset the cost of the biological products.

The CarbonNOW program has been a great fit for our farm. It was the only one I found that would evaluate and give us credit for the carbon-sequestering practices we were already using. So far, the carbon contract has paid out \$12 per acre each year in addition to providing Haney testing every other year over the 8-year contract. I'm unsure if this benefit is included in current contracts. The required biological products cost around \$4 per acre, which means we get \$8 per acre per year for practices we're already using and would continue using regardless of payment.

The Haney test results and high N costs were also a factor for us using exclusively Pivot Bio Proven 40 for my 2022 and 2023 corn crops. The test reported that I had enough N to grow 100-bushel corn, which is a good dryland crop in western Kansas. Good has been in short supply in the last few years. In 2022, we didn't harvest a crop at all due to drought and in 2023 only produced about half a crop, again due to



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EARLY HARVEST. In order to maintain a wheat-wheat-corn-corn continuous no-till rotation, some high-moisture corn is harvested in September to allow time to establish the next wheat crop. A Landoll vertical tillage tool is used to manage the freshly cut corn stalks and make it possible to drill wheat after corn. Vertical tillage is also used to incorporate manure and smooth the odd tire track.

drought. Up until the heat hit in 2023, the corn showed no visible N deficiency and went on to make 60 bushels per acre.

When we initially went with Pivot Bio, it worked out to \$0.52 per pound of N provided biologically, compared to \$1 per pound of synthetic N. Now that the cost of N is back down, it's a wash. We still prefer to supply N biologically, and Haney testing this spring will help us determine if that's possible. I think the goal is realistic as we're aiming for 100-bushel corn here, not 300-bushel corn. Plus, we think there are long-term benefits to encouraging the soil system to provide nutrients for the crop.

Drought Nudge.

Drought has made evaluating and implementing practices a challenge. It did push me to purchase a 30-foot roller crimper that I'd been considering for cover crop management. The crimper should help me reduce herbicide applications and might give me a slight advantage in the battle on herbicide-resistant weeds.

In 2022, heat and drought meant farmers in our area had to figure out how to terminate a corn crop in August that was still alive but would never produce. Conventional guys disced or mowed, but what were we going to do? Our crop was Roundup Ready, so we couldn't spray it economically. We were able to lay down the 6-foot crop quickly and efficiently with the crimper. Since the crop was still anchored, all the residue stayed in my field instead of blowing into the ditches when the winds inevitably came.

We intend to keep using the roller crimper to terminate cover crops. In the meantime, we found a bonus use for the implement in killing challenging weeds.

In fall 2023, we had patches of resistant kochia and pigweed after wheat harvest. Spraying would not work, mowing was time consuming, and tillage wasn't an option. Instead, we ran the roller crimper over just the patches several times at about 10 mph. It killed about 90% of the weeds. It wasn't

perfect, but it reduced the immediate pressure and limited the number of resistant seeds produced.

Ideally, we'll be using the crimper to terminate cover crops, which we try to establish on 20% of our acres each year. In a

normal year, which we haven't seen for 3 years, we would harvest wheat in late June or early July and drill a cover crop mix within 30-45 days, depending on moisture.

We work with Green Cover to get pre-made mixes. We relay our goals, and the company provides us with a multi-species mix that they think will work well in our system. Usually, we're looking for a variety of root types, residue to provide organic matter and catch snow, and cover to give some weed prevention.

It doesn't always work out, but when it does, it's impressive. We got an excellent early stand the year when moisture allowed us to seed right behind the combine. It crowded out the kochia, foxtail and other weeds, allowing us to forgo one herbicide application.

Cover crops usually run about \$25 per acre, depending on seed cost and timing.

Too often we as farmers don't properly value our time...

NO-TILL TAKEAWAYS

- Reduced yields don't always mean reduced profits.
- Traditional soil tests don't tell the full story of available nutrients.
- Hydraulic down pressure keeps planting operations uniform, improving stands.

The later they're seeded, the lighter the seeding rate. It's a hard cost to offset on paper as the results are reliably variable year to year. But we're still confident they're worth the investment in the long run. They might save us a spraying operation one year or capture more snow for the following crop another year. They will keep our soils cooler and provide more protection.

If I only look at the short-term numbers, I might be dissuaded from using cover crops or other practices. If I evaluate results over 5-10 years, however, the numbers likely even out.

Adding Up. Being a CPA has helped me more confidently make significant farm changes. Our shift to continuous cropping is one example. I could see the numbers worked right away.

In a normal year, we get 18 inches of rainfall, but we're able to flip from too much rain to a desert very quickly, as we have in recent years. The wet and dry years seem to come in a roughly a 4-year cycle, and everyone around here seeks ways like fallow to mitigate those ups and downs.

When we first started no-tilling, we were still stuck in the belief that we couldn't raise a crop without a year of fallow every few rotations to reserve moisture. Back then, chemicals were readily available, affordable and worked like they were supposed to, so we chem fallowed.

Instead of helping, fallow seemed to create problems. There often wasn't enough residue to protect the soil, and our soil structure had yet to recover from years of tillage. The result was baked, hard soils that we then had to battle to get a crop planted successfully.

We were spending time and money spraying those acres and not getting much of anything in return. After a few years, we realized that even if we only raised a 20-bushel wheat crop, continuous cropping would still pencil out to be more profitable than maintaining fallow.

Experience told us we could easily surpass those minimum yields. We had already raised 3 and even 4 crops in a row in our no-till system without yields suffering like we would have expected to see in a tillage system, so we started continuous cropping.

Yields weren't record breakers, but the numbers worked fine. More than fine, really. It has worked out to be about a

Check The Specs

NAME: Don & Charla Tilton

LOCATION: Quinter, Kan.

YEARS NO-TILLING: 20

CROPS: Corn & winter wheat

PRIMARY SOIL TYPE:
Silt/loam

PRECIPITATION: 18 inches

\$50 per acre increase over the course of our wheat-wheat-corn-corn rotation as compared to a rotation that included fallow.

Our soils started to change after several years of no-till and the eventual shift to continuous cropping. Soil organic matter (SOM) has moved from 1.5% to 2.75%. SOM and soil structure together have resulted in better water infiltration and improved drought tolerance, and yields have improved as a result. Once we had momentum, we continued to adopt practices and techniques to further build and support a healthy, functioning soil system. We switched to a Shelbourne stripper header for small grain harvest.


The header leaves more residue standing to shade the ground, conserving more moisture. It also adds efficiency at harvest. It takes in less material than other headers, so it takes less power to operate. We can harvest faster, while leaving residue evenly distributed across and firmly anchored in the field.

Other equipment changes have also improved efficiency and accuracy of field

operations. Adding Exapta Solutions' UniForce Hydraulic down pressure system on our 1990 John Deere air seeder has significantly improved the uniformity of our wheat stands. Even with no-till, we have occasional hard spots on terraces, end rows and tire tracks. In those challenging areas, we probably get a 25% improvement in stand as the down pressure is automatically adjusted on each row for perfect placement.

We also recently added an electronic scale to the air seeder for more accurate seeding rates with cover crops. That's been a critical change and one we wish we had made years ago. We're now experimenting with small-volume crops like camelina. When you're only seeding 10 pounds per acre, you want to know right away if you're precise

Accuracy and tracking help us be confident in our decisions and identify places for improvement. We use Climate FieldView in conjunction with Traction Ag farm management accounting software. With the two programs, we can track operations on the cloud in real time and more easily attach numbers and determine break-even costs for better farm management.

It's important to back up our decisions with fact. My father is now retired, and I will retire some day, too. My daughter Jamie and her husband farm with my wife Charla and me. Our son Lance helps with bookkeeping and other tasks that can be handled remotely. We want to make sure we're doing it right for however many years we have left so it's sustainable for our kids, grandkids and community. We think we're on the right path. 



MULTI-TOOL. Tilton purchased a roller crimper to terminate droughted out corn and intends to use it in the future to terminate cover crops. In the meantime, he's found he can effectively set back and even control patches of herbicide resistant-weeds with a few targeted aggressive passes of the crimper.