

WHAT I'VE LEARNED FROM NO-TILLING...

NO-TILL BRINGS CHALLENGES, SURPRISES AND NEW OPTIONS

Fewer field passes means this California no-tiller and dairyman can raise three forage crops per year.

By Michael Crowell

As interviewed by Martha Ostendorf Mintz

I TRIED NO-TILL because of the potential savings I saw, but it's brought us so much more. Making the switch to no-till has allowed us to raise three high-quality forage crops per year on the 270 acres we intensively farm in the San Joaquin Valley.

All that forage is important to my family's success. I'm in the business of growing crops to support the milking cows and developing heifers of our dairy.

My son, Adam, manages Bar-Vee Dairy and milks about 700 cows. We raise our own heifers, so our total herd is about 1,400 head. That's a lot of mouths to feed.

My family has milked cows in Turlock, Calif., for 110 years, but it still isn't easy. With the volatility in the dairy market it's tough to make a living. Growing as much of our own forage as possible allows us to offset some of that volatility.

Before no-till we could only raise two forage crops per year because we had so many field operations to fit in between

crops. We would rip our ground 30 inches deep, disc, pre-irrigate and disc again with a seedbed disc and then roll it before planting. At this stage my brother did most of the farming, but when we divided the farm I started thinking about the cost- and labor-saving aspects of no-till.

I had always been a conventional-tillage farmer and didn't believe it was possible to grow good crops without tilling. But with the substantial savings it offered, I tried 20 acres of no-till corn. To my surprise, it grew!

The next year I had all 270 acres of our irrigated field planted to no-till corn. The results were pretty good, but the big stubble discs we had used before meant our ground wasn't very flat. That's not ideal for our flood irrigation system. Since I was pretty much sold on no-till, I decided to go in and re-scrape and level my fields.

I've no-tilled for the last 5 years and it's been great. We've seen an improvement in the soil, we get better percolation of our irrigation water, and crop production has

TILLAGE THAT
BREAKS DOWN SOIL
STRUCTURE DOES
NOT BENEFIT
INFILTRATION...



been as good as — if not better than — conventional tillage.

PLANTER LEARNING CURVE

After that first year I decided to buy my own corn planter. I wanted a twin-row planter so I could maximize my population without creating root competition.

In 2005, I purchased a 12-row Monosem twin-row planter. It plants two rows 7½ inches apart on 30-inch centers, leaving me with a 22-inch space for spraying.

I've experimented with populations and discovered that 45,000 plants per acre is too high, and I've settled on about 38,000 plants per acre. I like a good, big ear and a lot of grain in my silage so I don't want my ear size to suffer because of my populations. At 38,000, with the proper hybrid, I can still make 34% starch on a dry-matter basis when harvesting the whole stalk for silage. That's excellent for milk cows.

Twin-rows are working great for us now, but the first time I took the planter through the field was definitely a learning experience.

First off, I was trying to plant directly into winter forage stubble. I thought I could just use a regular row marker. Was I wrong! It would roll out a row mark and then the oat



ADAPTING NECESSARY. It took adding a tool carrier with a 300-gallon fertilizer tank to get Michael Crowell's new twin-row planter to maintain even depth in his newly no-tilled soils. It also allowed him the toolbar space needed to set up for banding fertilizer.



CHECK THE SPECS...
NAME: MICHAEL AND ADAM CROWELL
FARM: BAR-VEE DAIRY
LOCATION: TURLOCK, CAL.
YEARS NO-TILLING: 6
ACRES NO-TILLED: 270
IRRIGATED, 350 DRYLAND
CROPS NO-TILLED: CORN,
FORAGE SORGHUM, WHEAT, OATS AND
TRITICALE

SPACE IT OUT. When it was time to buy a no-till planter, Michael Crowell decided to go twin-row to maximize his populations without reducing ear size in his valuable silage. The green stubble has to be rolled to make way for drilling forage sorghum.

stubble would fall right back down in the mark. I couldn't follow a row at all.

I was desperate to get the corn planted, so I put a big disc blade on the marker. It cut a furrow, but it was hard on the marker. It's not made to pull that kind of pressure at 7 feet out. The next year I bought a basic GPS unit to guide me. Such a unit is definitely a must for no-till.

The design of my new planter created some serious problems.

It was mounted on a toolbar and hooked to the tractor with a 3-point hitch. Because all of our moisture during the corn season comes from irrigation we're able to control soil moisture at corn planting. We always plant into dry ground.

Unfortunately, the dry ground had some hard places where the weight of the planter wasn't enough to push the disc openers 1½ inches into the ground like we prefer. I had that planter loaded down with seed, but with our lighter tractor we couldn't put any more weight on it for risk of lifting the tractor off the ground.

I tried tightening the springs on the planter unit, but it would just float up over those hard spots. Some of the seed didn't get as deep as I would like. I felt I could do better than that.

The next year I bought a tool carrier with a tongue hitch and hydraulic wheels. When I was hooking the planter directly to the tractor's 3-point, I didn't have enough tractor weight to counterbalance the deadweight I needed to add to the no-till planter.

Instead, I hooked the planter to the tool carrier and put a 300-gallon fertilizer tank on the carrier. The tool carrier then balanced the weight of the planter.

This served two purposes, since I also

wanted to band fertilizer between my twin-rows. There wasn't enough room for the coulters on the planter. Instead, I was able to put a bar on the tool carrier and hang coulters on it to place fertilizer.

A NEW ROTATION

With no-till we discovered we could pretty much pull into the field to plant while they were still harvesting silage at the other end. That meant we had more growing days we could put to use, so we added another forage crop.

We plant corn by April 15 and try to harvest the silage by Aug. 1. Now we're able to follow up with forage sorghum.

The sorghum needs 65 days to grow, so we have to plant by Aug. 5. It can't

"THAT FIRST YEAR OF NO-TILL WOKE ME UP TO SOME SOIL ISSUES WE HAD"

be direct-chopped for silage because it wouldn't dry down. We have to swath it and let it sit until it dries down to 70% moisture and will make silage.

Finally, we drill a winter forage of oats, wheat or triticale, or a combination of those crops, near the end of October. Those crops grow all winter. We do get some cold nights, but 25 degrees is cold for us so they do fine. Winter forage is harvested in early April.

Growing three forage crops doesn't mean we get more tonnage of forage, but we get at least equal tonnage of high-quality forage.

There's always two ways of looking

at things. With two crops we could let them grow longer to get more tonnage, but quality may suffer. Letting the winter forage crop grow longer results in more lignin, which isn't great for milk production.

For our situation with the dairy, I see three high-quality forage crops as a great advantage. We're able to harvest each crop while it's young and at its peak. Every pound of quality feed I can produce is a pound we don't have to buy.

ROLLING ALONG

A disadvantage of no-tilling three crops per year, especially with corn in the mix, is that there's no time to allow the stubble to break down before the next crop goes in. We don't have much trouble planting corn into grain residue, but drilling sorghum following corn takes some planning.

At that point, the crown is still a living thing, so they're tough. Our solution was to pull a heavy-duty roller in front of our John Deere 750 no-till drill. It breaks the crowns of the cornstalks and keeps them from interfering with the drill.

We can run the drill at 500 pounds of downpressure, but with the small sorghum seeds we need to keep them shallow. For the sorghum crop to succeed, it's essential to smash down the corn stubble.

While the ¾-inch forage sorghum stalks aren't the major problem that 1½-inch corn stalks can be, we still have to use the rollers when drilling our fall forage crops. The fine-stemmed winter-forage crops create no issues for corn planting.

COMPACTION WATCH

Farming in the San Joaquin valley is very



ONGOING LEARNING. Participating in tours, attending the National No-Tillage Conference and reading as much as possible has been vital to Michael Crowell (far left) for no-till success.

different than in the Midwest. We get all of our rain from November through March and get virtually none the rest of the year. But we have a tremendous irrigation system that allows us to control how much and when our crops get water.

After 5 years of no-till we get better water penetration, the soil has more pores and is structurally stronger. I want to keep it that way, so I'm very conscious of compaction, which can happen with the natural settling of our different soil types.

With irrigation, this has to be leveled or it will result in pooling water.

To ensure a dry harvest I walk a fine line with my irrigation schedule. I scout the field often to determine when the corn is ready and isn't taking up water anymore.

As close to that point as possible, I stop irrigating to let the field dry out. I don't want any moisture when those 15-ton trucks hit the field.

Spring is when we're still vulnerable. We've been lucky so far, but we do run the risk of a late-spring rain interfering with winter forage harvest. We hope to avoid it because with flood irrigation we have to take care of any ruts. Even slight differences can lead to pooling water.

IRRIGATION AND FERTILITY

In our corn we end up irrigating about seven times. We irrigate immediately after planting and again when the corn is knee-high. After the second flooding, we irrigate lightly once a week.

Irrigation allows us to spoon-feed the crop nitrogen. We add a little bit of liquid fertilizer and manure water from the dairy retention ponds. Products with sulfur are preferable because plants need sulfur and there's less of it in the environment.

Putting down 30 pounds of liquid nitrogen between the rows at planting and some 9-14-3 in the row as a popup holds the crop over until irrigation starts. The crop usually gets a total of between 250 and 300 units of nitrogen per acre.

Using dairy manure really helps us keep our soil nutrient levels even, but we have to make sure we don't get too much of some nutrients, such as phosphorus.

GETTING TO KNOW THE SOIL

When used conventional tillage, I worked the ground to make a decent seedbed. With no-till, I discovered some harder ground that needed attention.

Because we harvest silage instead of grain we can't use a yield monitor to identify places that aren't yielding well. We

"IT'S ESSENTIAL TO SMASH DOWN THE CORN STUBBLE FOR THE SUCCESS OF THE SORGHUM CROP"

were farming somewhat blind. That first year of no-till woke me up to some soil issues we had.

Soil testing revealed that I needed quite a bit of calcium in some areas, and that my calcium-to-magnesium ratios were off. We tested the fields in 20-acre blocks, applying lime as needed according to test levels.

With no-till and the lime applications working together, my soil is more mellow. If it weren't for wanting to put down fertilizer when planting, I could probably hook the planter directly to the tractor without any issues now.

LIGHTER AND CHEAPER

No-till has greatly reduced my operational costs. We've cut down on man hours and gotten rid of a lot of equipment, including our 300- to 400-horsepower, 4-wheel-drive tractors.

Our biggest and oldest tractor is 112-horsepower and the one we use the most only is only 87 horsepower.

We don't use additional pesticides with no-till — our herbicide program has simply shifted. Before we would pre-irrigate, apply our herbicides and then plant. Now we apply herbicide after the corn is up and growing.

Herbicide applications have to occur in-season to control not only weeds, but any re-growth from the winter forage crop. Applying herbicide after harvest wouldn't do any good because the harvested plant is in shock and not actively growing.

We use Roundup Ready corn. It's just a necessity in this system.

DRYLAND CHALLENGE

Three years ago I decided to enter the grain business, so we picked up 350 acres of dryland ground in the hills. You can only put in winter crops there, so it's been a challenge.

I'm trying to leave as much residue as possible to catch the rain. I leave all the trash alone and run an AerWay through the dry field to open up the heavy, clay soils. I also hook my heavy roller behind the AerWay to break up clods, then I no-till my wheat right into that. The dryland ground was worn out so we've had to pour fertilizer into it, but we're making progress.

No-till is definitely the way to go in this area. It's nice, when it rains, to have that organic matter to hold the water and soil in place on the hills instead of it running off into the valley.

Leaving the organic matter was an idea I picked up from Paul Jasa of the University of Nebraska when I was on a tour. Continuing education has been a large part of my success with no-till.

Once I started no-tilling I've never missed a single National No-Tillage Conference, I read magazines and get hands-on advice from my University of California-Davis extension contact, Jeff Mitchell.

He's organized tours and trips back east to visit no-till operations. I feel like a real amateur compared to the guys we visit, but I'm learning a lot and I'm sold on no-till.

