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

World Records Still Leave Room For Higher Yields

Kip Cullers says he — and other no-tillers — can produce yields that go beyond levels that already leave some observers in disbelief.

By Kip Cullers
as interviewed by Ron Ross

IT'S AN UNDERSTATEMENT to say that we've had a lot of publicity since harvest of 2006, when the word got out that my farm had placed first or second in three categories of the National Corn Growers Association yield contest (including a first-place 347.26 bushels per acre in a no-till irrigated class) and also weighed out a world-record soybean yield of 139 bushels per acre with conventional tillage.

I admit I was pleased to see the mounting interest in my goal of coaxing the most yield I can get out of these crops.

Still, I feel one of the really intriguing no-till stories on our farms has been somewhat overlooked. It's a story that goes beyond high yields and gets right down to what I call "true, true, profitable no-tilling." It makes no-till soybeans look like child's play and even no-till corn-on-corn by-the-numbers simple.

"REAL NO-TILLING"

We renovate about 2,000 acres per year of old fescue pasture sod and, with a little help from Mother Nature, get a "free" 200-bushel no-till corn crop in the process. Sound good? It

A WINNING COMBINATION. Kip Cullers stunned a lot of onlookers with his corn and soybean production in last year's yield contests. He credits his precision, twin-row Monasem planter as one of the factors in his contest-winning production.

DIFFICULT BUT REWARDING. Kip Cullers uses a gallon of Roundup per acre to get 40-year fescue sod (green in foreground) ready for the no-till planter, but it makes for world-class yields.

CHECK THE SPECS...

NAME: Kip Culler

LOCATION: Purdy, Mo

YEARS OF NO-TILLING: 20

ACRES NO-TILLED: 2,000 (Farm operation includes 5,000-plus arces.)

CROPS: Corn, soybeans, green beans, spinach, collard, kale, mustard, turnips

is, but it takes a firm commitment and a leap of faith to believe it can be done the first time you try it. After our experiences, I believe that if you can successfully no-till into 40-year-old fescue sod, you can no-till into anything!

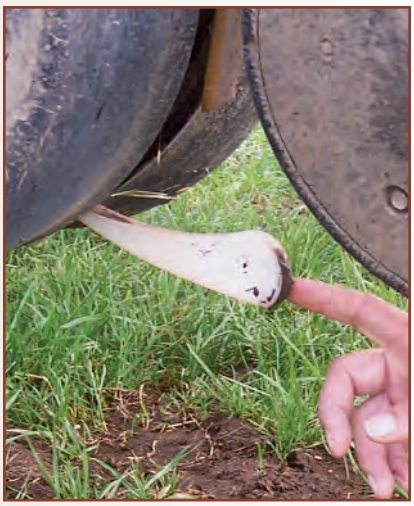
Killing this old, established sod is not easy, but a gallon of Roundup per acre gets the job done. It might compare to farmers in the Midwest going out and no-tilling into grass waterways established many years before. That gives you an idea of the tough conditions we're dealing with.

We start the burndown with 2 quarts of Roundup per acre plus a quart of atrazine applied about 2 weeks before planting. A fall application might be preferable, but in our cattle country, we don't like to kill good pasture before we have to. Then, after no-tilling Roundup Ready corn, we go back in with another 2 quarts of Roundup when the corn plants are about knee-high. Even in years when weather prevents us from making the preplant Roundup application, we are able to post-apply all of the Roundup after no-till planting and get a good kill of the fescue.

There are tremendous benefits for growing corn the first year out of fescue. When I say we get a "free" corn crop, I'm referring to the 100 to 120 units of nitrogen that have built up over 2 decades that we reclaim by not plowing. With the tremendous amount of decaying residue in the soil, it's an ideal place to grow corn because of the constant release of carbon dioxide into the corn canopy.

And it's a good way to protect the soil during the renovation. This year, for example, a neighboring fescue sod field that had been plowed was a flooded quagmire after a night of heavy rain. In our field, the killed sod was soggy, but we were able to plant in a couple of days.

One of the exciting things about no-till pasture renovation (the fields are no-tilled to perennial ryegrass after the initial corn crop) is that growers are likely to want to do it again after 5 or 6 years of grazing. With about 90 percent



THREE BIG KEYS. Cullers points to several no-till planter components as essential for producing top yields, including: a pneumatic downpressure system (above), Keeton seed firmers (lower right) and eSet vacuum discs from Precision Planting (top right). The flat disc design handles all seed sizes equally well, he says.

of our southwestern Missouri land in fescue, the potential for no-tilling into sod is seemingly endless.

SETTING UP THE PLANTER

I'm a firm believer that a good share of the no-till planter attachments you see at farm shows or online are strictly gimmicks that cost you money and time. In fact, we've even removed the no-till coulters from our current 16-row John Deere 1700. And when we're planting into sod, we also remove the trash whippers because they aren't going to do anything except cause us trouble. However, I've learned there are three essential features we must have on the planter for no-tilling into sod or for continuous corn, as well as planting conventional corn and soybeans:

- ✔ A pneumatic down force system, maxed out at 110 to 120 pounds, is a must for getting superior crop emergence in tough no-till conditions. We also use large seedboxes that help maximize downpressure.
- ✔ Precision Planting eSet vacuum discs overcome singulation problems, prevent doubles and assure uniform seed placement, even in rocky fields. The replacement disks cost about $100 per planter unit and are well worth the investment. They're simply the best thing we do to get even stands in rough field conditions.
- ✔ Keeton seed firmers press kernels into the bottom of the seed slot, which encourages maximum germination. They are inexpensive and very effective.

About the only other feature we'll order on new planters in the future (we trade often) will be Martin trash

WHAT A DIFFERENCE A PLOW MAKES. These two former fescue pastures are located on opposite sides of the same road. The plowed field (top) was a muddy quagmire after an overnight rain, while the killed fescue sod soaked up the water and was ready for no-till planting within a couple of days.

whippers on the front, and we limit our use of them to planting corn on corn. We've used spiked closing wheels on one of our planters, but we found that in our conditions they tend to drag the seed back on top of the soil. While spiked wheels are touted for preventing sidewall compaction, in my opinion if you're getting sidewall compaction, it's probably too wet to no-till anyway.

Our system does make it tough on double-disc openers. After 2,000 or 3,000 acres, they usually need replacing, but we're not really talking much money versus all the other attachments we might be buying and wearing out as well.

Contest plots are another matter. Because we're very serious about exploring the full potential of corn and soybeans (we're targeting 500-bushel corn and 200-bushel soybeans), we invested in a twin-row Monosem precision planter, more typically used for planting high-value vegetable crops. Auto-guidance provides perfect spacing between the twin rows, which are 8 inches apart.

We plant east to west to take advantage of the sun's movement during the day. While we plant our commercial fields at 40,000 to 46,000 plants per acre, we crank up the population to between 56,000 and 70,000 for contest plots.

THREE KEY STEPS TO HIGHER YIELDS

Whether you're aiming for contest-winning yields or just a good overall average on your fields, no-till or conventional, I've learned there are three basic, cost-effective steps to follow that will make you money. A lot of our procedures carry over from our vegetable business, where we are very careful because a simple mistake anywhere within the production schedule can result in a non-marketable crop.

1. Pick the best plant genetics you can get for your area. While I have selected mostly from Pioneer hybrids and varieties, DeKalb, Beck's or another brand might be best for you. I test about 50-plus corn hybrids and soybean varieties from several companies on my farm every year and check as many yield test reports as I can that apply to southwestern Missouri.

In addition, I look for the biggest and heaviest seed I can get. Big soybean seed produces bigger beans in the field. High test weight seed corn gives better performance overall.

Match your hybrid to the field and your expectations. For example, for my winning no-till irrigated contest plot, I planted Pioneer 31N28, a 119-day YieldGard racehorse hybrid, a great choice for optimum growing conditions. (I

wouldn't plant it on iffy, dryland soils.) It's aggressive and responded well to a 60,000 planting rate population (56,000 at harvest) and some tender loving care. In our test plots, it's always the hybrid to beat.

2. Get really serious about providing crop protection. For me, this means walking every field, every day. That's the only way to know what's happening, and I've learned a lot can happen in 24 hours. Making any crop decision from the seat of your pickup can be a very huge mistake.

We routinely fly on Headline fungicide about a week to 2 days before tasselling and might follow up with one or two additional sprayings if conditions warrant. (You basically have a choice between two fungicide modes of action; I feel there has been more extensive research on Headline).

The broad-spectrum fungicide prevents damage from a long list of costly diseases in corn and soybeans, including anthracnose, gray leaf spot and several rusts and blights. Plants stay healthy, green and growing longer in the season, thus coaxing out more yield. On my contest plot, the corn plants were totally green from top to bottom when we harvested on Oct. 7. We apply Headline to soybeans at first bloom and again 3 weeks later.

Irrigation only magnifies the need for protection. Hot, wet days in heavy crop canopies make for a disease-breeding factory.

Insect protection is also mandatory in my fields. On my contest plots as well as commercial corn fields, seed is treated with Poncho 250 or 1250, and we also apply liquid Capture insecticide to control cutworms, rootworms and other soil insects. We use soybean cyst-resistant seed and spray the crop with Warrior insecticide.

3. Kill weeds early — when they're only a quarter-inch tall — and keep them from robbing nutrients and sunlight all season. Fortunately, the easiest thing a farmer can do with today's hybrids is stay ahead of weeds. If this means you need two applications of Roundup, don't hesitate.

> ""I HAVE LITTLE DOUBT THAT I WILL ACHIEVE 500-BUSHELS-PER-ACRE CORN AND 200-BUSHELS-PER-ACRE SOYBEANS..."

With the volume prices available, the herbicide is virtually free once you pay the seed tech fee. At $10.50 a gallon, that's only $2.50 per acre assuming a quart rate. It's the cheapest protection you can buy.

MANAGE MOISTURE

While center irrigation pivots are tools to get us "over the hump," it can be a big hump. We can count on temperatures above 90 degrees for extended periods during critical crop growth stages every summer. We often irrigate 24 hours a day, starting in early July. Our goal is to provide the crop only what it needs each day for maximum growth while never letting it go into moisture stress. That's a lesson that transfers over from vegetable management.

Corn, for example, gets only two-tenths to three-tenths of an inch of water per day. We run the pivots over corn at night to cool down the crop and reduce transpiration. With soybeans, we water at mid-day to cool the plant and prevent blooms from being aborted, especially during early plant development. Each bloom you save is a potential pod. No-till crops, with evaporation reduced by residue cover, require fewer waterings than those grown in conventional fields.

SPOON FEEDING

Chemigation is a key part of my fertilizer program, which also includes 3 tons per acre of poultry manure from our broiler houses. We apply liquefied nitrogen and ammonium sulfate (atmospheric sulfur has been reduced by the closing of coal-burning plants) through the pivots, and occasionally we also add other secondary nutrients and micronutrients. We spoon feed the plants at rates determined from annual soil tests and tissue testing done throughout the season.

We're also trying other yield boosters. On my first-place irrigated plot, I preplant-applied 200 pounds of Hummate, a product designed to build organic matter, and sprayed on a liquid phosphorus and potassium blend 10 days prior to tasselling.

Technology helps me manage the center pivots (all

Zimmatic) with minimum effort. If any of them shuts down for any reason, a computer program automatically calls me on my cell phone wherever I am so I can either get to the site quickly or call my dealer for help.

HOW HIGH CAN YIELDS GO?

As I have stated many times at farmer meetings, to seed company reps, ag journalists and others, I have little doubt that I will achieve 500-bushels-per-acre corn and 200-bushels-per-acre soybeans. Surprisingly, I think hitting the soybean target will actually come first, because soybeans have much more genetic potential than most growers and many researchers can imagine.

In the soybean plot where we harvested 139.39 bushels per acre of Pioneer 94M80, I believe we achieved only 10 percent of the actual yield potential. This takes a good calculator to tabulate, but it's kind of fun.

In a soybean field with 245,000 plants per acre, which we had, there are 1,470 bushels per acre worth of blooms (30 nodes per plant, 12 blooms per node) that can be developed into more than 90 million pods — or aborted. If that's true, then by winding up with 120 pods per plant, we actually aborted 90 percent of the potential pods even while we more than tripled the average national soybean yield. But that means we're still doing a dismal job of soybean management.

The world-record harvest was from a Group IV soybean variety. Ironically, we had planned to plow up that field, which was seeded extra heavy (300,000) for green manure in preparation for our 2007 corn yield contest plot. My goal was to get big plants that would add a lot of nitrogen back into the soil.

But I realized about mid-season that this was something special. I had never seen a field of beans like it, and neither had the seed company agronomists and reps from the Missouri Soybean Association I showed it to. The plants were chest high and the canopy so thick that the only way we could walk through them was by following the pivot tracks. Even after documenting the record-breaking harvest (245,000 final stand), there were doubting Thomases who didn't believe — and still don't — that soybeans have this much yield capacity. But we know better.

> "I've learned there are three basic, cost-effective steps to follow that will make you money..."

This year we're closely watching a Group III experimental. When preparing this report in May, it was far too early to speculate on what yield we might achieve. Whatever happens in 2007, I'm committed to keep pushing the yield window open as wide as I can for both soybeans and corn.

I invite anyone who wants to take a look at my contest plots or other parts of my farming operations to visit www.growingpoint.com. That's the Pioneer Web site providing a wealth of information to growers. You'll find several videos taken on my farm that cover everything from planting and crop emergence to irrigation management. Several photos and a video of my 2007 plots and fields are also available, and there's a place to send me a question about your own farming operation if you would like.

An Outstanding Yield Performance

Kip Cullers earned widespread attention by capturing either first or second place in three categories in the 2006 National Corn Growers Association yield contest. His placings included:

No-Till/Strip-Till Irrigated Class:

- 1st place, 347.27 bushels per acre.
- 2nd place, 338.24 bushels per acre.

Ridge-Till Irrigated Class:

- 2nd place, 297.11 bushels per acre.

Conventional Tillage, Irrigated Class:

1st place, 332.77 bushels per acre.

In addition, Cullers captured the top spot in the Missouri Soybean Association yield contest last year with a world-record harvest of 139 bushels per acre.