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No-till On The Plains

Ceiling Unlimited

by Matt Hagny

Tom Cannon certainly thinks differently. This gentleman farmer of north-central Oklahoma questions everything—*everything*—with the incisive mind of a skilled businessman. A few minutes with him, and you'll soon be re-examining your own deeply held conclusions. Self-proclaimed active environmentalist, an avid hunter and outdoorsman, and devoted family man are crucial aspects of the man who's also a highly successful farmer and cattleman.

The Cannon operation, Goodson Ranch, has been in the family for 4 generations, and is headquartered southeast of Blackwell along the confluence of the Chikaskia ('cheh-KAS-kee') River and Bitter Creek, and also extends on into the hills farther east and north. In the early 1900s, this farm—along with Oklahoma as a whole—grew more corn than wheat, a trend that has resurfaced in recent years on the Goodson Ranch. While the deep bottomland soils along the Chikaskia were perhaps less ravaged by a century of tillage and erosion than were the hills, long-term no-till and other new techniques deployed—and sometimes invented—by Tom are helping rejuvenate the depleted land whatever its topography.

A sizeable field near the Chikaskia prompts commentary from Tom:

Photo by Matt Hagny.

2008: Another prosperous dryland corn harvest on Cannon's farm.

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"It's a Norge soil, almost gravelly underneath, but the topsoil is very tight clay. [Most of Cannon's soils are deep silty clay loams.] In '97 it had been in wheat for as long as I could remember, and as long as Dad can remember. The best wheat crop it had ever made was 28 bu/a. I went completely to no-till in '97, so I double-cropped it to soybeans, which made in the low 30s—the best crop it had ever raised. The next year I planted corn, which was pathetic—about 60 bu/a." Tom continues, "It was clear that it needed a very long break from wheat, so I went to brome plus red and rose clovers. I had trouble getting the brome to meter out with my air drill, so I added 50% wheat. The wheat grew much better than expected, so not knowing what to do, I let it go to maturity, then went and skimmed it off

"If there's sunlight and moisture, I gotta have something growing."

with my [Shelbourne] stripper head. Despite the growing brome and clover, the wheat made well over 50 bu/a! That blew us all away. And I had a fantastic stand of brome and clover." (*Editors' Note: Rose clover is similar to red clover except that rose is an annual.*)

That brome + clover mix was hayed and grazed for 6 years, without any herbicide, although it was limed twice. In '07, Tom took the first cutting of hay, then sprayed a burndown on the brome, "Trying not to kill the clover. It wasn't going to hurt anything." He seeded wheat that fall, which made in the mid-50-bu/a range. Most of the clover survived and made seed, although the field had a prosperous double-crop of soybeans on it in early Sept. '08.

A State of Play

With Cannon continually exploiting opportunities and testing new ideas, no standard crop rotation exists for the 2,700-plus acres of cropland under his management, of which about 680 acres are pivot irrigated now (he had none a mere 8 years ago). However, a typical crop sequence for Tom would be 2 to 3 years of corn, followed by wheat/ dc soys. Occasionally single-crop soybeans are grown, especially under irrigation. "It's very field-specific," he says. Sometimes cowpeas are double-cropped instead of soybeans, especially if the field has grown several soybean crops in the past and is beginning to show some disease pressure. Double-crop corn is another option he uses at times. Cannon almost never stacks wheat, and rarely plants milo anymore. Cover crops of clover and/or canola are frequently drilled in the fall after corn and soybean harvest: "If there's sunlight and moisture, I gotta have something growing." (He grew winter canola for grain harvest in '03, but hasn't since.)

In the late '90s, Cannon was using primarily a rotation of wht/ dc soys >>milo >>soys, which, Tom says, "wasn't intense enough. We usually tried for early milo, which made for a long time from milo harvest until the soybeans were planted. We needed a cover crop but didn't recognize it." Instead, beginning in '99, Cannon began growing substantial acres of dryland corn in place of milo, and seeding the wheat into the corn stalks—thereby eliminating the single-crop (full-season) soybean. (Cannon has never had a significant problem with head scab in wheat following corn, not even in cool & rainy '08; being a few degrees warmer in his region makes all the difference.)

While Tom frequently uses transgenic corn hybrids (110 – 118 day) with Roundup Ready and corn-

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No-Till on the Plains Inc's Mission: To assist agricultural producers in implementing economically, agronomically, and environmentally sound crop production systems.

Objective: To increase the adoption of cropping systems that will enhance economic potential, soil and water quality, and quality of life while reducing crop production risks.

borer *Bt*, he sees little or no reason to be using rootworm *Bt*, noting: "We have so little rootworm problem in this area." (And it's not that rootworms are escaping his notice, since Cannon is a keen observer and also employs a CropQuest consultant.) Tom notes the transient advantages of these technologies in the face of shifting and adapting pest populations, particularly glyphosate-resistant marestail (now in great abundance in his area) as well as armyworms that are unfazed by some types of *Bt*. Further, virtually all the Palmer pigweeds in his area are resistant to both triazines and ALS herbicides.

Yet Cannon aggressively pursues new technologies that add to his profitability. The Palmer pigweed problem has been countered with the Callisto component of Lumax, and the glyphosate-resistant marestail are being tackled with hot mixes of ET (pyraflufen) + crop oil in burndowns ahead of dc soybeans, although Cannon astutely notes that it's much easier and cheaper to use appropriate chemistries in the growing wheat, and then let the wheat canopy keep the marestail shaded out the rest of the season. For controlling marestail in his single-crop soys, Cannon has had only limited success with high rates of Synchrony, and will be going to FirstRate, metribuzin, and other chemistries in the future. Still, Tom emphasizes that there's no substitute for good crop competition—the soggy, cold '08 spring weather thinned his corn stands on bottomland significantly, letting Palmers come through the Lumax later in the season: "I relied too heavily on technology. I should've started over [by replanting]. The best weed control I have is crop canopy."

While Tom assiduously replants any drowned-out areas to keep the weeds down, he balances the weed-control urge. "Not every non-crop plant out there is bad. It adds diversity."

Photo by Laurie Cannon.

Tom usually has a cheerful outlook, but his '08 dryland double-crop soybeans are yet another reason to smile. Tom says, "If you happen to get the moisture, you want to have everything in place to take advantage of it."

Lately Cannon has been addressing his fertilizer program, including many secondary and micronutrients. His area has rather high zinc levels due to widespread dust being deposited from a previous industry near Blackwell, so zinc deficits have never been a problem. Tom inherited typically high P levels from his dad's farming practices, so again, no problem, although he applies maintenance rates especially on wheat. Tom has applied abundant S in recent years, too, making way for pleasant responses to other nutrients, such as magnesium on wheat (he has been applying several trace elements as well.) The one nutrient on which Tom has been conservative is N, with his efficiency coming in at a lean 0.7 lb of N per bushel of corn, and 1.3 – 1.6 lbs of N per bushel of wheat produced. Cannon has gotten serious about plant tissue sampling, and now aims to monitor and improve his practices via those report cards.

"The best weed control I have is crop canopy."

Tom credits the more balanced nutrient program with letting him set a new personal-best on wheat in '08, with a largish dryland field making 100.5 bu/a. His five-year average for wheat is 57, which includes many acres of hailed-out wheat in '08. Cannon's 5-year corn average is 85 bu/a, which includes one year of zero yield when *all* of it was put up for hay. He says, "In hindsight, I really regret [taking the corn as hay]. I took a hit on soil quality. Financially it was a wash [break-even], but in the long run I lost money because of the N and P removed."

Old & New

Cannon recently upgraded to a 16-row JD 1770 CCS planter, which includes row cleaners, Keetons with Mojo Wires, and Martin Spader closing wheels. For '08, the planter ran without any fertilizer capabilities (remember his high soil levels of P and zinc), although that may change as he seeks to become more efficient with N application methods—trying to avoid mulch cover losses as well as denitrification. The planter is used primarily for corn, and part of the single-crop soys. Essentially all his double-crop soys go in with the drill on 15-inch spacing, and wheat on 7.5-inch. Cannon's drill is a Deere 1860, updated with 90-series boots and SDX firming wheels. Tom says, "That drill has done 40,000 acres, but it's in as good a shape as when I bought it—that's because I completely rebuilt it this last year." Tom reports that their wheat stands are a lot better than in their tillage days.

For field operations, Cannon runs RTK guidance and uses controlled traffic on his level bottomland, adding, "I would never do that on [rolling] upland." Spraying is accomplished with a RoGator. For a labor force, the Cannon operation has 2 full-time hired men as well as another part-timer who loves to run the farm's leased combine. Tom's mother does the bookkeeping. Tom credits no-till with freeing up enough time during the year for his coaching of baseball and other youth activities, not to mention time for his wife and their 4 kids.

Cattle & Land Health

Tom's innovation extends to Goodson Ranch's stockers and cow herd, and the forages to feed them. Tom exudes enthusiasm for his alfalfa / native rotation: "It's the most incredible alfalfa I've ever seen, and it was seeded directly into native sod [that was sprayed out]. The first year was a very dry year, and it still yielded over 5 tons/acre for the year—nobody else made over 4 tons/a that year. When I'm done with the alfalfa, it will go directly back into native [species] by spraying out the alfalfa." Cannon's alfalfa is put up for hay, to be fed in the winter: "That goes against what I believe. We shouldn't be hauling all this feed to the cattle." (Will Tom revamp that system too?)

As for the cropland, Cannon has done relatively little grazing recently, although he second-guesses: "I've been critical of myself for past cattle I've run on cropland. I priced myself out of the market [when doing enterprise analysis]." He explains, "I wasn't crediting anything for the manure. . . . We know for sure there are soil biological benefits to cattle manure. These soils were developed with the buffalo [as part of the ecosystem nutrient-cycling mechanism]. . . . There's so much going on in the soil that we don't yet understand."

Tom clarifies further: "Grazing dead stalks is a no-no. We only graze living plants." —which for Cannon is a growing wheat crop (this *is* Oklahoma), as well as cover crops. (Cannon previously grazed wheat, then didn't for 2 years, and now will revisit it.) Somewhat surprisingly, Tom states that his best irrigated corn yields have followed crops (or covers) that were grazed. Tom also notes that most of his fields have a grassed refuge area where the cattle can congregate when conditions get wet out in the field.

Continuous no-till and improved soil characteristics are distinctively helping Tom's crops: "In a dry spell, my dryland corn holds on about 9 to 11 days longer than neighboring tilled fields. For soybeans, it's almost 2 weeks. That's huge."

Photo by Matt Hagny.

Cannon's 2008 irrigated full-season soybeans have tremendous potential due to skillful agronomy and the field not having grown soybeans for several years.

Past & Future

As journalist G.K. Chesterton once noted, "The only way of catching a train is to miss the train before." That aptly describes the twists of Cannon's life, who had farmed for a spell, then returned to Okla. State Univ. in '95 to pursue biological engineering—Tom didn't make the grades during his first stint, due to a penchant for partying, but was a 4.0 GPA the second time around: "I had a thirst for knowledge when I went back to school that outweighed any previous thirst for beer. My thirst for knowledge hasn't been quenched. I love to read."

Photo by Matt Hagny.

The Chikaskia runs through the Cannon land, creating both challenges and opportunities. Tom loves the wildlife habitat along its banks.

Tom's career-track changed yet again when his dad was in a bad car accident in January of '97, prompting Tom to return to the farm once more (Tom's dad had a lengthy recovery, then developed other health problems that have prevented his return to being physically active on the farm). Tom attended the No-Till on the Plains conference in January of '97, which provided the final impetus for the change: there was to be no more tillage on the Cannon farm from then onward, with the exception of a few fields that were tilled one last time in '97 to smooth them. (Their tillage equipment was soon sold, or now has enough rust to be ready for the museum, Tom says.)

Tom explains that his attitude was always skeptical of tillage: "I never could understand why we did all that tillage, then packed it down again to plant wheat. We ran plows for 2 weeks, then ran the disk in 24-hour shifts to beat the clods around. We worked it into a fine powder before running packers over it to firm it up for planting." He continues, "I knew very little about no-till when I started, but I went to the No-Till on the Plains conference and saw other people who were making it work. And I never bought into the thinking that it works in those places but not over here."

The stewardship ethic runs deep in Tom: "It is very, very important to me to leave the land in much better shape for the next generation. We have the technology and knowledge to do so." Those sentiments go far beyond no-till, to encompass tree plantings each year on their land along the river, including 7,000 trees in a single year: "The river banks erode so quickly, so we're putting trees back where fifty or sixty years ago there were dozers taking trees out." (The trees also benefit the ranch's outfitter business.) Cannon also thinks differently about flood control: "Instead of these big watershed dams, which are nearing the end of their life expectancy, let's capture more of the water with trillions of tiny dams of residue in the fields."

Despite knowing that his methods are improving the cropland as well as being profitable, Tom doesn't solicit landowners in the neighborhood: "I let them come to me." And despite his incredible progress, he's still restless: "There are better ways of managing than what I'm currently doing. I'm still searching."