Early summer is prime time for spraying soybeans, as Mark Mueller is doing in this no-till field.

Ground Control

An Iowa farmer protects his fragile soil with no-till farming and cover crops.

Story by Mark Mueller, Waverly, Iowa

PHOTOS BY SOIL HEALTH PARTNERSHIP/MICHAEL HICKS

I'm the fourth-generation Mueller on this land in northeastern Iowa. My great-grandfather settled in Bremer County in 1894. My wife, Jeri, and I raised our two daughters in the house my grandfather built in 1946. Although I had worked in the seed industry after college, Jeri and I wanted to raise our future family on the farm. Now my retired dad is a poorly paid employee (but a very well-paid landlord)! Mueller Farms raises corn for grain and for silage, forage rye, alfalfa, soybeans and specialty beans for the export market.

Over the years we've transitioned to no-till farming, which reduces our time, labor and machinery use by eliminating tillage passes. My goal is to keep vulnerable soil from eroding during increasingly heavy rainfall events here. Soil loss, water quality and economics are all issues forcing farmers to look at different farming practices. This is especially true in my state of Iowa, where our water quality is rapidly becoming the most important environmental concern. One solution is the use of cover crops during early spring and late fall, something that helps store nutrients and hold the soil in place.

To contribute, I chose to join the National Corn Growers Association's Soil Health Partnership. The SHP's goal is to calculate the economic value of planting cover crops and using other healthy-soil practices. I hope to show other farmers that this is a long-term investment rather than a short-term cost.

Corn, Fireflies and Alfalfa

June 16 A rare meteorological phenomenon occurred today: It was calm. This is noteworthy because calm days don't happen often enough in Iowa, and June is our peak month for spraying. By July, corn is too tall to get the sprayer into the field. If my corn was only "knee high by the Fourth of July," I'd be on the phone to my crop insurance agent.

June 17 Tonight Jeri and I walked down our dead-end road to watch fireflies. Thousands of them had clustered over the 5 acres of rye grain Dad planted around his house. It looked like an arena concert with cameras flashing.

June 18 It's Father's Day, and I didn't spend it in the tractor! Both daughters were out of town, and Jeri spent the day with her parents. So I picked strawberries from the garden, bought some vanilla ice cream and invited my folks to join me on the porch. Then we drove to Waterloo to tour the new John Deere Tractor & Engine Museum—well worth a trip to northeast Iowa.

June 19 Our father-and-son millwrights, Zeke and Chris Zajic, came to repair some of our grain bins and augers. Flowing grain eventually wears holes through metal. The flighting on one of our soybean augers was worn to a sharp edge, which can damage grain, so it needed to be replaced. Chris climbed up about 60 feet to weld steel over a hole on a pipe. Zeke, 64, has been erecting our grain bins and elevators since the early 1980s. I used to worry about finding another millwright when Zeke retires. It's a good thing Chris joined the family business.

June 20 I chaired a meeting of the Bremer County Planning & Zoning Commission today. These hearings are sometimes packed with angry neighbors. I want to preserve crop ground and to keep farmers and non-farmers from clashing. Put an urbanite's house next to a working farm, and you will increase the flash points that lead to lawsuits. Zoning laws help all property owners by keeping ag interests in the country and keeping business and residential interests inside city limits.

June 21 The Extension Service's Northeast Research Farm put on its first summer field day today. Various professors from Iowa State University discussed the changing weather (it's been raining more), weeds that are more resistant to chemicals, and the nitrogen fertilizer that's contaminating our groundwater. Also discussed: cover crops, something that could help solve the three other problems.

June 22 A Mennonite family that does custom harvesting came to cut and chop my alfalfa field for the Dutch dairy next door. Back in 2005, I sold 20 acres to a young couple from the Netherlands who wanted to milk cows in the States. They've slowly built a 600-head dairy. Other family members have joined them. Now there are seven more children in the local school system, four more full-time jobs

Mark and Jeri Mueller (left) have picked up some of their grown daughters' childhood chores, including gathering rocks in the fields. The job is a good excuse to put Mark's 1953 Dodge 4x4 to work.

and an operation that pays the county more in property taxes than my bare field ever did. I sell them alfalfa, silage corn and cover-crop forage and apply their cow manure on my fields as an organic fertilizer. There is no better economic engine for rural America than a dairy cow.

Weed Control and Family Time

June 23 Our crop consultant, Jason Gomes, typically scouts our fields looking for problems with weeds, insects or disease—anything that can impact yields. While he was here today we discussed chemical combinations to combat weeds now resistant to the chemicals that used to kill them. For a while, weed control was easy; we just used Roundup. Mother Nature put an end to that. Now I suppress hard-to-kill weeds with cover crops.

June 24 My daughter Katie flew in for a wedding this weekend. She's an Iowa State grad in animal ecology, now working a six-month fellowship at CROW (Clinic for the Rehabilitation of Wildlife) on Sanibel Island, Florida. When Katie was just 10 years old, she would bring lunch out to the field. I would sit in the passenger seat and eat while she combined soybeans. I'll hire her to drive a tractor, truck or combine at harvest if she doesn't have a job lined up after her fellowship is done.

June 26 I had planned to spend time with Katie and our other daughter, Sarah, who was home from Loras College in Dubuque. Unfortunately, a grain-auger bearing went out, which cascaded into a whole series of repairs and rescheduling. I finally got to relax with Jeri and the girls by the fire pit at dusk.

June 27 Our millwrights came back to finish last week's work. They also fixed all the things that broke in the last 48 hours. FedEx delivered the parts for repairs on my main truck, a 1953 Dodge 4x4 pickup.

June 28 The Iowa Corn Growers Association started its two-day directors' meeting in Des Moines. (I represent 11 counties in the state's northeast corner.) In the 1970s, Iowa corn farmers voted to create a voluntary checkoff system. We pay a penny per bushel toward crop and livestock market development, research projects and environmental programs at the state and national level. The promotion of ethanol, one of the biggest markets for corn, is partially funded by Iowa-checkoff dollars. The next big thing may be plastic soda bottles made from corn instead of petroleum products.

Rocks and Cover Crops

June 30 When Katie and Sarah were younger, they got paid for picking up rocks. Now Jeri and I do the dirty work. We use GPS equipment to find rocks we marked during planting. Switching to no-till farming means fewer rocks come up to the surface where they can damage machinery.

July 1 I find alfalfa to be the best cover crop. Once planted, it can last five years or more, and there's a strong demand for hay. A lot of hot, dirty labor goes into making the small square bales for which horse owners pay a premium. Thankfully, this field is next to the home of the industrious Cornick brothers, with whom I have an arrangement to share the alfalfa crop. I plant, fertilize and spray the field. The two young men bale it three or four times a summer, sell it at the local hay auction and split the proceeds with me. Those 8 acres are easily my most profitable.

July 5 Growing cover crops that crowd out weeds allowed me to delay spraying soybeans until today. A combination of cover crops and no-till farming lets water from heavy rains soak in faster. That allows topsoil to stay dry enough for me to enter the field earlier without getting stuck in mud.

July 6 A note of explanation to western readers: Water problems east of the Missouri River usually involve *too much* water. Perforated plastic tubing (known as tile line) is typically buried about 4 feet deep and 40 to 80 feet apart to drain the fields. Occasionally we come across clay lines that were hand-dug by teams of workers a century ago. When old lines collapse, we bring in a tiling contractor. That's what happened today. Dad went along to help with the repairs.

Then, this evening, the Greater Waverly Municipal Band gave our weekly concert in a park by the river. A local business gave away popcorn and lemonade. Food vendors grilled their specialties. Young couples pushed strollers, and senior citizens in lawn chairs sat and visited. Pontoon boats floated just offshore. Walkers, bicyclists and kayakers arrived in time to see the first act, a local magician. Then the honor guard presented the flag, and the band started playing. Musicians ranged in age from middle-schoolers to my 86-year-old father.

Grain Futures, Ethanol and Insurance

July 7 Corn Belt weather concerns drove grain prices to their highest levels since March, so I sold corn today for delivery in two years. My plan is simple. If the market sets a futures price I wish I had right now, I take it. Most of this year's corn was sold before I ever planted it.

July 8 Plenty of people raise corn and soybeans, yet prices barely exceed costs. Cover-crop acres have been doubling each year. The demand for seed is growing, and rye grain is cheap to grow.

GRAIN FUTURES 101

Buyers and sellers get together (electronically) at a centralized marketplace, such as the Chicago Board of Trade. Instead of trading actual grains—like corn, soybeans, oats or wheat—individuals and companies lock in futures contracts. Such a contract is a binding agreement to buy or sell a specific quantity of grain in the future at an agreed-upon price (usually higher than the current price, Mark Mueller says). The place of delivery is also detailed in the contract. But the contract comes with some risk to the farmers, who are obligated to pay investors a market-based premium for any quantity of grain they can't deliver due to crop failure.

While rye seed costs $10 per acre, corn seed costs $125 per acre. The chemicals to kill weeds cost me nearly $50 per acre last year while cover crops choke out weeds free of charge. I can earn more money raising rye seed than I'd make growing corn. I dazzled Jeri with this financial acumen over a bottle of wine by the fire pit.

July 9 Jeri and I traveled to the Iowa Speedway in Newton to watch the Iowa Corn 300, an IndyCar race sponsored by the ICGA. Cars raced on ethanol at speeds a normal minivan would never see. Ethanol is made from field corn, not the sweet corn that we eat. Only the starch in the corn kernels is used for ethanol, leaving protein, fat and fiber to make an excellent livestock feed called distillers dried grains.

July 10 Our longtime insurance agent retired, so we interviewed a potential replacement today. It's a good time to re-examine our coverage. Farmers have so many areas of exposure that insurance is a necessity. Crop insurance helps me (and my banker) sleep at night. Our combines have caught fire in dry cornfields; grain bins have collapsed on buildings; lightning has killed livestock; and an axle failure once resulted in smashed cars and downed power lines that blocked Main Street for hours.

July 11 Chuck Byrum, our retired blacksmith, still takes care of a few customers, and we're grateful to be on his short list. We really needed him to make a house call today. I can torch and weld some, but Chuck can design and fabricate one-of-a-kind tools and machines. A 110-year-old machine shed built by my great-grandfather received some long-overdue maintenance.

Locks, Barges and Leisure

July 14 Yesterday I worked at my desk making grain sales for corn grown from 2016 through 2018, and pricing fertilizer and cover crop seed for this fall. Today I attended the ICGA's 50th anniversary

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A FARM FOURTH

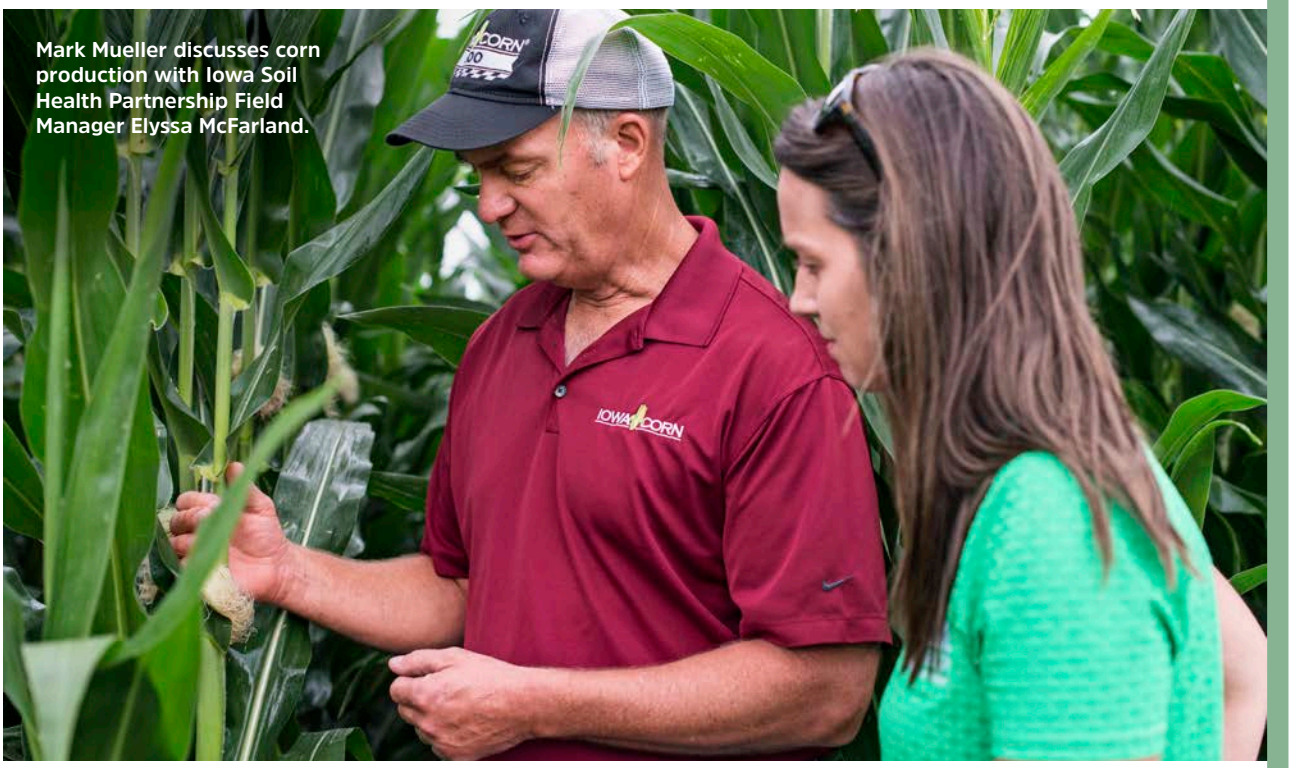
MARK AND JERI MUELLER like to stretch their Independence Day celebration from the family farm to nearby Shell Rock, Iowa, population 1,296. For more than 15 years, they've kicked off the holiday by inviting friends and family over on July 3 to sample craft beers and eat cake on the porch. At 9:45 p.m. everyone jumps on the hayrack (pulled by a 1953 John Deere 70 tractor) and rides to a nearby hilltop to watch the Shell Rock fireworks. The past year was special, though, because more than pretty pyrotechnics exploded over the rural landscape.

"Heat lightning lit up the western sky, while a half-moon illuminated the cornfields below us," Mark says. "We all enjoyed both man's and nature's displays."

On July Fourth, it's off to Shell Rock for the town celebration, which includes carnival rides, food vendors, a beer tent and the annual parade. "It's a big social event," Mark says.

Every fire department within 20 miles, plus antique tractor owners, area businesses and politicians take part in the parade. Scout troops march by. The local FFA chapter introduces its teacher. Princesses and queens from the dairy, pork and beef associations wave to the crowd. Local dance teams, gymnasts and groups of guys operating radio-controlled cars and drones display their skills. The Greater Waverly Municipal Band—35 musicians riding on a flatbed semi—provides a rousing mix of patriotic marches. Mark plays the trombone.

"Shell Rock's parade shows the unique spirit of small towns," Mark says. "Everyone watching the parade knows everyone in the parade."



Mark Mueller discusses corn production with Iowa Soil Health Partnership Field Manager Elyssa McFarland.

celebration, which took place on the bank of the Mississippi River at Lock 10 in Guttenberg. Perfect weather brought 150 members to listen to speakers from earlier days (including Dad) recounting legislative, research and marketing landmarks achieved since 1967. Members also toured the aging lock system built in 1937. Today grain moves downstream to the Port of New Orleans, while barges filled with fertilizer, coal, iron ore and even asphalt (kept molten at 300 degrees) move upstream.

July 15 We stayed busy getting ready to visit Katie in Florida. I authorized my agronomist to act on my behalf if a plague of locusts threatens my crops and the co-op needs to spray my fields. A tour guide reserved two dates in September to bring ag tourists here to visit a "real farmer" and climb around on our machinery. And a letter arrived from a local attorney who is selling 64 acres of the best land in the county; bids start at $10,250 per acre. Jeri sprayed apple trees in hopes of a big-enough harvest to run my grandfather's cider press.

July 21 A productive month on the farm ended with relaxing on the beach and reading books while visiting Katie in Florida.

Fellow farmer John Maxwell (right) gives some advice at a Soil Health Partnership field day at the Cinnamon Ridge Dairy farm.

The work starts again as soon as I get back. Before harvest I'll empty out grain bins, follow the markets, prepare our machinery and try to anticipate what will go wrong. I can count on one hand the number of days in past years where nothing broke down, plugged up, got stuck or just wouldn't start during the six or seven weeks of harvest. I'm fairly sure that in some years I've worked for free. Like nearly every farmer I know, however, I love this life. Seldom are two days the same. There are no cubicles. And every day is casual Friday.