

COVER STORY

THE BIO-HARVEST IS HERE

Surplus piles may continue to grow, but bioprocesses are expanding viable corn uses.

ABOUT THE COVER. Corn producers are on the hunt for developing product markets in an effort to reduce an ever-increasing supply.
Cover photo by Dave Tonge.

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Brewing Up Water SAVINGS

MillerCoors works with barley growers and NRCS to refine irrigation practices.

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The Changing Food LANDSCAPE

Farmers' markets grow in significance as more consumers want to know the source of their food supply.

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Brewing Up Water Savings

MillerCoors works with barley growers and NRCS to refine irrigation practices.

BY KARL WOLFSHOHL



Soil health improves by leaving barley stubble a full year without tillage, Brian Neufeld says.

PHOTO: SUSAN ARTACHEVARRIA

In Colorado's San Luis Valley, Brian Neufeld considers it a victory to save even 1 inch of irrigation water. The aquifer feeding his wells normally recharges relatively fast, but it has declined during the extreme drought of recent years. Now, area farmers are trying to recharge the system with help from the Natural Resources Conservation Service (NRCS) and MillerCoors, the brewer buying much of their barley.

"We're looking more at soil health than anything else to save water and other inputs," says Neufeld, who grows potatoes and barley on his own and with family members. "That's our big push here. You can increase soil health by leaving barley stubble and reducing tillage. We're showing that it's working on our farm, and it's nice having MillerCoors working on that, too."

Neufeld traditionally tilled the residue when barley and potatoes were harvested in the fall then tilled again in spring. Seven years ago, he stopped fall tillage. He began tilling only in spring with a one-pass disking and chiseling.

"Soil health got better, so we no longer need to use a chisel," he says. Now, he uses a vertical-tillage disk without chiseling. Leaving barley fields fallow in alternate seasons has been another soil improver.

"Soil health comes from giving the barley stubble a full year with no tillage," he says. "It helps mellow out the soil. We're seeing nitrogen build up in the soil with stubble. We had been applying 120 units of nitrogen for a 140-bushel yield, and now we're down to 30 units."

HOLDING CAPACITY. Water is also conserved.

MillerCoors agronomist Judy Jolly, who is stationed in this valley, explains that plant biomass increases with reduced tillage, building organic matter, which gives the soil more water-holding capacity.

"The healthier your soils are, the more water they hold," Jolly says. "In poor soil, the water drains through because there is nothing to hold it."

MillerCoors provides a consulting service that suggests best-management practices for the growers producing the brewer's barley. "[We talk with growers] about their issues and make suggestions on how they

might improve their actions,” Jolly says. The research comes from real-world work.

In 2011, MillerCoors and The Nature Conservancy started the Showcase Barley Farm, in the Silver Creek Valley, Idaho. Irrigation efficiencies there have improved. MillerCoors says the farm saved 270 million gallons of water between 2011 and 2012. The company has released no new numbers.

On its own farm in the San Luis Valley, MillerCoors is experimenting with more efficient irrigation methods, such as LEPA (low-energy precision application) drag hoses. LEPA is designed to make more water from center pivots reach the earth rather than evaporating or being blown away.

“We also have companion crops planted in with potatoes or barley, so there isn’t as much soil exposed,” Jolly says. “At MillerCoors, we’ve looked into crimson clover, hairy vetch and lentils. This is a really new idea here.”

In Idaho’s Magic Valley, Ryan Miller is experimenting with his own versions of water conservation. Miller, who is farm director for Grant 4-D Farms, at Rupert,

is seeing advantages for more controlled irrigation application thanks to soil moisture probes and a highly detailed data set collected by a consultant working for MillerCoors. Miller is one of three cousins who are the third generation working on their family farm.

“MillerCoors contacted us in fall 2015 to do a research project to reduce water use while improving crop quality,” he says. “Your first thought as a farmer is that this doesn’t happen, right?”

SURPRISING RESEARCH. It did “sort of” happen in 2016, the farm’s first year with the testing, but in corn not barley. All of Grant 4-D’s barley had been planted by the time the trials got under way. The work was expanded onto more acreage and multiple crops, including barley, in the 2017 season.

In 2016, on the last tower of one pivot, the farm replaced traditional wobbling sprinkler nozzles hanging 5½ feet off the ground with LESA (low-elevation spray application) nozzles that travel a mere 12 inches from the soil surface. AquaSpy (www.aquaspy.com) probes buried under the crop showed more water was consistently reaching the soil ►

Low-elevation spray application (in front) applies water 1 foot above the soil to reduce evaporation.

PHOTO: RYAN MILLER

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Ryan Miller uses soil moisture probes to manage his irrigation schedule.

PHOTOS: COURTESY OF RYAN MILLER

with the LESA system. So, the goal of keeping more water from evaporating or

being blown away was successful. There was one unintended consequence.

Throughout the growing season, the crop under LESA looked better, Miller says. But, ironically, yield monitors showed that the LESA-watered corn yielded 10 bushels per acre less. Data compiled for MillerCoors showed that corn under LESA actually was overwatered because the ground was consistently wetter, not forcing roots to go as deep in search of water, and thus the lower yield. Miller is making adjustments this season as he and MillerCoors expand testing.

The moisture probes themselves have been a water-saver and are gradually leading to better quality barley going to the beer maker.

“Once I got comfortable with them, we saved around \$6,000 in irrigation costs on one pivot. I could see there was plenty of subsoil moisture, so we shut off the system,” Miller says. “Without those probes, I would have kept watering. The probes are truthing the farmer’s intuition against that little electric device in the ground.”

Juan Juarez, an agronomist for the brewer, based in Idaho, says shutting off the water at the right time improves barley quality.

“Growers pay for the water, and they hate to see it go down the canal, so they irrigate,” Juarez says. “But, we pay for quality, and the last irrigation is key to quality. Our focus is to make water use more efficient, and it’s worked so far. We keep a report card,

and if there’s higher disease or damage, it’s normally from overwatering.”

REMOVE THE GUNS. Grant 4-D Farms has also removed the end guns and corner machines from its center pivots in a cooperative program with NRCS to better manage a dropping aquifer. Without the corner machines, the farm dedicates the resulting dry corners to wildlife habitat. The ground has been enrolled in the agency’s Conservation Reserve Enhancement Program. Miller is considering installing solar systems in some of the dry areas to power the farm’s irrigation pumps.

Barley growers Neufeld and Miller don’t know each other, but certain facts tie them together. Annual rainfall where they farm is scanty, to say the least—in single digits in both valleys. Aquifers that feed their irrigation wells aren’t what they used to be. And, their barley eventually finds its way into cans and bottles at MillerCoors breweries.

Water conservation through irrigation and soil improvements fits perfectly into the beer maker’s long-term goal of reducing water consumption. Thus, the company has showcase farms in Idaho and Colorado developing ideas for its roughly 800 barley growers, who are based mainly in four states, to reduce water consumption. Some of its grower families have been supplying barley to the company for 70 years.

“The key thing about research at the Coors farm is that we’re taking some of the risk out of exploring water-conservation products or ideas for growers. The grower can assess how something is working here,” Jolly says. Two examples are the use of moisture meters and Colorado State University’s WISE (Water Irrigation Scheduler for Efficient Application) program. Farmers growing barley for MillerCoors also have access to the company’s Barley Farming Sustainability Guide.

MONEY ON THE TABLE. Marco Ugarte, sustainability manager for MillerCoors, says the company fully realizes barley growers, usually working with NRCS, were already advanced in terms of saving water and improving soils. But, the brewer wants to contribute where it can. In some cases, MillerCoors covers an additional 6 to 10% of expenses for water-saving practices on top of cost-sharing that NRCS provides to farmers.

“Only 10% of the water used across our value chain goes to manufacturing operations,” Ugarte notes. “The other 90% is located in on-farm applications.

“Barley and hops fields present the biggest opportunity for our company,” he continues. “By 2025, MillerCoors is looking forward to improve water-use efficiency in our agricultural supply chain and malting operations by 10%.” ●