

CornSTalk

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‘Innovation’ gets a campus

Innovation Campus phase one, to be built on the former state fairgrounds, includes (from left to right) the Industrial Arts building with rooftop greenhouses, a new life science building that includes wet labs and the former 4-H building, which is connected to a new companion building.

The Nebraska Legislature approved a \$25 million investment into Innovation Campus this year, which is being tripled by private funds. What does that investment mean for rural communities?

Since 93 percent of Nebraska’s land is in production agriculture and more than 30 percent of the state’s jobs are related to agriculture, it makes sense that the focus of Innovation Campus will often tie back to Nebraska’s rural roots.

from ag products and it becomes clear Innovation Campus has tremendous potential for farmers and rural communities.”

Dan Duncan, executive director of Innovation Campus, said the food, fuel and water areas of focus are broad enough to include many areas within the university’s expertise and fit perfectly with the state as a whole.

Groundbreaking for phase one of the University of Nebraska’s Innovation Campus is set for August in Lincoln, at the former state fairgrounds. The key focus areas of this multi-faceted campus are food, fuel and water – areas that are in many ways of significant interest to Nebraska’s rural communities and farmers.

“Innovation Campus was planned to capitalize on Nebraska’s strengths and uniquely position the university and Nebraska as a whole when it comes to research and technology,” Duncan said. “Yet Innovation Campus is not just a place; it’s a state of mind. It’s an interface between the university and private business no matter where that business is located.”

“Every farmer is involved in food production, and a large number of Nebraska farmers utilize water for irrigation, which is unique in the Midwest,” said Alan Tiemann, a farmer from Seward who is chairman of the Nebraska Corn Board. “Add in biofuels like corn-based ethanol and the potential for new biofuels and biochemicals

Once a new technology or innovation is created in Nebraska, it gives the state an advantage of being the first to deploy and to market. Duncan explained the development of a pilot project or





Evapotranspiration (ET) gauges, like the one shown here, let farmers know how much water corn plants have taken up from the soil and evaporated into the air. Watermark sensors keep track of how much water is available in the soil. Combined, these two technologies give an accurate picture of water use and reduces irrigation amounts, saving both water and the energy dollars to pump it.

H₂O h?

proof of concept may happen on Innovation Campus, but deployment could be anywhere and “we’re hoping that would be here in Nebraska.”

Tiemann said some of the projects coming from Innovation Campus could make a difference in how farmers grow crops and what those crops are used for. “The potential is wide open,” he said, “all it takes is an idea and we could see new fiber and biofuel projects being built in rural Nebraska or food production facilities, ideas that are created and driven by small businesses throughout the state.”

Phase one of the 232-acre Innovation Campus includes four buildings, including the former 4-H building and Industrial Arts building on the former state fairgrounds.

In total, this phase includes around 300,000 sq. ft. plus infrastructure and pad ready sites. Facilities in phase one will begin to be occupied in late 2013.

A network of sensors lets farmer Mark Jagels of Davenport know when he should water his corn crop and when it makes sense to wait a few days. This is key information because Jagels wants to use the least amount of water possible but still produce a good crop.

When needed, supplemental water in most cases is delivered through a pivot – a large sprinkler. It’s pretty common in Nebraska to see pivots providing water to corn during the summer. Nationally, though, only 11 percent of the corn crop receives supplemental water from irrigation. The rest relies on rain.

Because Nebraska is unique in terms of irrigating corn, researchers have done a lot of work to help farmers best manage this natural resource. That includes the network of sensors managed by the University of Nebraska that Jagels and other farmers follow online.

Some farmers, including Jagels, also install their own sensors so they can manage water use more specifically for their location. “The investment is worth it,” he said, “because the cost of buying sensors is easily offset by leaving pivots shut down for longer periods of time.”

The sensors used by Jagels and in the university network are watermark sensors and evapotranspiration, or ET, gauges.

Watermark sensors are buried in the soil at different depths and tell farmers how much moisture is available to their crop. ET gauges tell farmers how much water their corn crop is transpiring. Combined, these tools tell farmers how much water the plants are using and when they may need to irrigate.

Research using these tools has shown farmers how to reduce their water use up to 25 percent while still achieving good yields. “When it’s hot and sunny you want to believe it is drier than it is, that the crop is using more water,” Jagels said. “We’ve learned that isn’t always the case. The technology available today lets us know it’s okay to wait a few more days before irrigating, and that saves money, energy and water.”

CORN CHIPS?

By analyzing a sliver – chip – of a corn seed, plant researchers can discover if it has the right genetics and yield potential before it ever goes on to the next phase of research.

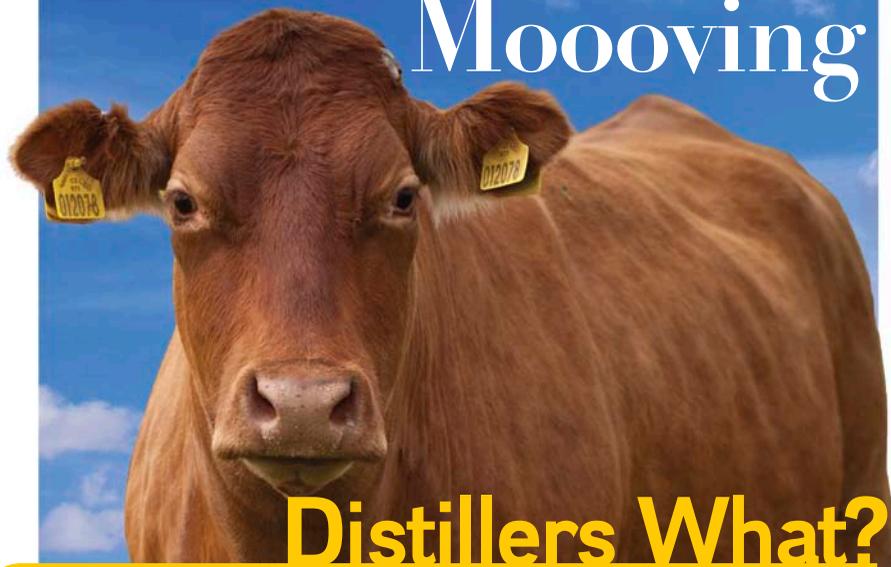


Automated tools remove the chip, which while tiny, is big enough for researchers to analyze for the right genetic markers. If tests on the chip show it has potential, the seed moves forward and is planted in the next phase of research.

Removing a chip does not damage the corn kernel’s ability to grow but it saves considerable research time by eliminating seeds from the program without having to plant, grow and harvest the next generation.

With this sort of enhanced molecular breeding, the odds of finding the right combination of higher yield genes is one in five, compared with two in one trillion in conventional breeding!

Cattle drive— Mooving



Distillers What?

Ethanol plants in Nebraska are one of the biggest suppliers of a key feed ingredient to the state's livestock producers – that's right: Key feed ingredient.



Of course Nebraska's ethanol plants take in corn and produce a lot of ethanol, about 2.8 gallons for every bushel of field corn they buy from nearby farmers, producing more than 2 billion gallons a year, making Nebraska the second-largest ethanol producing state in the country. Yet the same plants also produce nearly 18 pounds of livestock

feed from that bushel of corn – more than 6 million tons every year.

That feed – distillers grains – is sold to local livestock producers or dried and shipped across the country. Since ethanol is made from the starch in each kernel, distiller's grains is comprised of the other components, which makes it high in fiber and protein and an excellent feed ingredient. In fact, it's sought after by livestock producers, especially cattle producers, since cattle enjoy it so much.

Some ethanol plants also extract a portion of the corn oil from each kernel. This non-food grade oil is a great feed additive for poultry, but it can also be processed and converted to biodiesel.

All told, an ethanol plant is truly a biorefinery! A plant using 16 million bushels of corn to produce 45 million gallons of ethanol can also make 135,000 tons of low-oil distiller's grains and 12 million pounds of corn oil.

Think beef production is important to Nebraska? How about this: There's nearly four head of cattle fed in Nebraska each year for every man, woman and child living in the state. That's a lot of beef!

Yet Nebraska also ranks sixth in the nation in hog production and is in the top ten for laying hens. All

Corn Board, said farmers must evolve to stay viable and be successful.

"Production methods change, technology changes, and the products consumers want also change," she said. "In the end, farmers work hard to deliver on all fronts."

forward the right way

told, about half of Nebraska's farm operations also raise livestock or poultry, and a vast majority of all farms are owned and operated by farm families.

Jon Holzfaster, who raises cattle and corn on his family's land near Paxton, Neb., said the generations of families who raise livestock – and feed for those livestock – continue to discover better ways to raise cattle and produce corn.

"We never stop learning. Every year we figure out something new and drive change," he said.

This notion of continuous improvement is key to Nebraska's position in food production in the United States and globally, Holzfaster explained. "It also ties directly to the economic success of farm families, rural communities and the state as a whole, plus the thousands of Nebraskans whose jobs tie back to agriculture," he said. "We wouldn't be the second-largest cattle on feed state and third largest corn producing state in the country if the state's farmers and ranchers didn't work to get better."

Kelsey Pope, director of advocacy and outreach for the Nebraska

For corn production, farmers today have access to seeds developed to grow stronger and more resilient crops. That helps protect yields and prevent insects from eating and damaging the crop. "Corn farmers today utilize a number of tools to sustainably produce more corn per acre," Pope said. "Seeds are important, but so is GPS technology that allows farmers to put the right nutrients in the right place for the plants, and that can vary from field to field or even within a field."

For livestock producers, it means keeping animals from getting sick by ensuring they have access to quality feed, proper nutrition and clean water. By keeping animals healthy, farmers and ranchers know those animals will produce the affordable, lean cuts of beef and pork consumers prefer.

"I want to do a good job. Farmers want to do a good job," Holzfaster said. "Nebraska and American agriculture have always set and achieved high standards. Yet we know there is more we can do and that's why we're in a mode of continuous improvement, year after year. Tomorrow's corn crop, tomorrow's beef will be even more sustainable than it is today."

More Nebraska-made fuel on its way to the pump

Who can use E15?



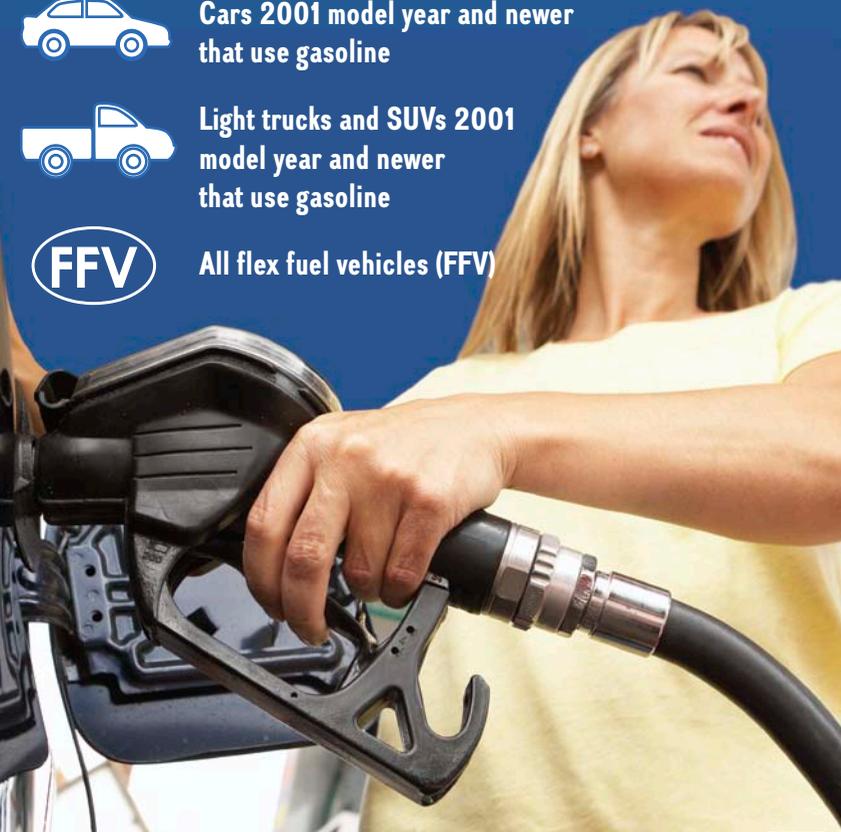
Cars 2001 model year and newer that use gasoline



Light trucks and SUVs 2001 model year and newer that use gasoline



All flex fuel vehicles (FFV)



55 miles per gallon?



You'll zip right past gas stations more often in 2025 thanks to higher fuel economy standards that are on the way.

Mileage standards agreed to by all major automakers sets 54.5 mpg as the average for each automaker's fleet by 2025, almost 20 mpg more than today's standard.

While automakers may take different paths to get there, most will rely on liquid fuels and take advantage of downsized, turbo-boosted engines to increase fuel efficiency. To boost power and efficiency these engines will need a higher octane fuel than what's available today.

With a blending octane rating of 113, higher ethanol blends are a perfect solution for automakers working toward maximizing fuel economy. One automotive engineering firm noted that three out of every four vehicles in 2025 will need a higher octane fuel to meet energy efficiency standards – and ethanol is part of the solution.

Nebraskans were quick to begin using ethanol when filling up their vehicles. In fact, more than 80 percent of the fuel sold in the state contains ethanol, a renewable fuel made from Nebraska-grown corn.

While E10 has been a successful fuel for many years, ethanol producers were looking to the future in 2009 when they proposed increasing the allowable use of ethanol to up 15 percent, or E15. They knew ethanol production was increasing because plants were becoming more efficient, and they recognized an opportunity for Americans to use more U.S.-produced renewable fuels.

More than 5,000 Nebraskans voiced their support of E15 by sending postcards to the U.S. Environmental Protection Agency. "People supported E15 because they recognized the importance of increasing the use of home-grown fuels," said Kim Clark, ag program manager for the Nebraska Corn Board. "They also understood that ethanol provides a tremendous economic boost for the state, especially in rural communities where ethanol is made, and it keeps energy dollars local instead of sending them overseas."

Before E15 could make its way to a fuel pump, much research needed to be done to ensure it was safe for use in existing vehicles – hence the delay from the proposal in 2009 to final approvals this year. "E15 is probably the most researched fuel in history, with some 6 million miles of testing, which is great because it shows E15 works perfectly," Clark said.

While the approval process through EPA was rigorous and time consuming, Clark said in the end the research proved solid and EPA gave a green light for E15 to be used in cars, light duty trucks and SUVs model year 2001 and newer. "That's more than 120 million vehicles across the country that use about 85 percent of the fuel sold today," she said.

E15 is not a mandated fuel, so gas stations can decide if they want to offer it, and they must use labels indicating that E15 is for 2001 and newer vehicles. Some states will also need to update their fuel regulations to allow the sale of a higher ethanol blend. That will create a roll-out of E15 over time, although most expect it to become available first in the Midwest, where most of the country's ethanol is produced.

"The end goal is to increase the amount of renewable fuel available to motorists in the United States, which will help lower fuel costs and reduce our dependence on petroleum-based fuels," Clark said. "In Nebraska, we're in pretty good shape and we hope to see E15 available at pumps before the end of the year."

Do family farms exist?

A lot of words like “factory” or “industrial” are thrown around in the media and online when people talk about farming. Yet what do those words mean?

If a corn farmer has a big combine is she an industrial farmer? If several cousins form a corporation to protect their farm or take advantage of the tax code, are they a factory? What if a farmer uses fertilizer? Or herbicide? Or high-tech seed? What's the line between a “family” and “factory” farm?

In the end, a vast majority of corn grown in the United States is grown by family farmers. In fact, U.S. Department of Agriculture statistics show that **95 percent of corn farms in the United States are family owned and operated.** That's real people, real families with grandpas, moms, sons, cousins...all working together to make their farm as successful as they can.

Maybe one family farm has 200 acres and another 2,000. In the end, it doesn't matter, because both families want to be successful so the next generation can have their opportunity to live off the land.

Darin & Katie Robertson Family
Elsie, Nebraska



Three kinds of corn?

Drive across Nebraska during the summer and fall and you'll see miles and miles of corn fields. Did you know that more than 99 percent of that corn is “field corn” and won't directly end up on your plate for dinner or popped with a little butter and salt for a night at the movies?



FIELD CORN

Field corn is hard on the outside and starchy on the inside – it's not very tasty to people!

The top uses of field corn are livestock feed and ethanol production.

Components of field corn are also used to create bioplastics, crayons, vitamins, paint and a lot more.

You'll also find it used as a food ingredient in the form of corn cereal, cornstarch, corn oil and sweeteners.

More than 10 million acres of field corn are expected to be planted in Nebraska this year.

SWEET CORN

About 700,000 acres of sweet corn are grown each year – compared to 95 million acres of field corn.

The United States is the leading producer and exporter of sweet corn!

Several hundred species of sweet corn exist, and new varieties are always being developed.

POPCORN

Only about 220,000 acres of popcorn are grown each year in the United States.

Nebraska is the number-one producer of popcorn on some 67,000 acres.

Americans consume 16 billion quarts of popped popcorn annually – 52 quarts per man, woman and child.

What does a \$2.8 billion investment become?

Nebraska corn farmers invested an estimated \$2.8 billion this spring just to get the corn crop planted – and that doesn't even include the expense of equipment, land costs and labor. What becomes of that investment come harvest?



Corn farming in Nebraska results directly and indirectly in 63,900 jobs across the state, plus 10,900 jobs in the ethanol sector.

As Tim Scheer navigates his combine through cornfields near St. Paul, Neb., every fall, the millions of corn kernels piling into waiting semis are really little economic powerhouses upon which Nebraska thrives.

“Those kernels are pretty small on their own, but together they snowball into quite an economic driver,” Scheer said. “Livestock production, ethanol, bioplastics and other industries all utilize corn or products made from corn.”

Once corn leaves the field, everywhere it's used adds value. For example, an ethanol plant takes that corn and makes ethanol and distillers grains, a livestock feed. Fuel blenders add that ethanol to gasoline, while livestock producers feed distillers grains and turn it into beef, pork, poultry and dairy products.

“Corn is not only a predominant crop but a predominant enterprise. It ripples through the economy a long way. The

carry through of corn to processing and feed is just phenomenal,” said Dr. Bruce Johnson, an economist with the University of Nebraska.

In an analysis, Johnson and his colleagues estimated that corn production and its ripple just through the ethanol industry has a value-added impact of \$6.6 billion on Nebraska's gross state product (GSP is comparable to the gross domestic product on a national level). That figure is just the portion attributable to corn and ethanol – livestock and poultry each have their own sizable impact, as well, and rely heavily on corn and distillers grains as an input.

That figure also doesn't include all the products changing hands just to grow a crop. For example, the \$2.8 billion, roughly \$270 per acre, Nebraska farmers invested to get the crop planted includes only seed, fertilizer and other inputs necessary to get the crop off to a good start. That's dollars

that go to cooperatives, seed dealers and others who sell those inputs and employ thousands of Nebraskans, converting that \$2.8 billion investment into a \$7.0 billion ripple through the state's economy.

Shannon Landauer, executive director of the Boone County Development Agency, said corn, ethanol and livestock are all important to rural communities, as they create employment opportunities and support local businesses.

“Between late 2006 and the third quarter of 2011 we saw 170 new jobs and more than \$400 million invested in Boone County,” she said. “Having such a strong ag economy allowed us to weather the economic downturn pretty well. In fact, our unemployment rate is below 3 percent locally. Corn, livestock and ethanol all come together well for us.”

Landauer added that several recent grain storage projects alone were valued at more than \$1 million. “Those projects mean income for the community, in terms of construction costs and workers spending money here. It makes a significant difference for smaller communities,” she said.

The analysis by Johnson and his colleagues pegged direct and indirect jobs for corn production at 63,900 across the state, plus an additional 10,900 jobs for ethanol. The labor and proprietor income generated from these jobs comes to nearly \$5.3 billion – and that's not even counting the role of corn working through the livestock sector.

“Those are big numbers, important numbers for Nebraska,” said Scheer. “The investment corn farmers make every spring is the foundation for the state's economy, thousands of jobs and a lot more. It's pretty incredible when you think about it.”

Cattle Health: Sights and sounds

As a volunteer EMT, Joan Ruskamp's body language interpretation skills come in handy. The first thing she does when arriving on the scene of a call is to see how the patient looks and acts. This is important for the initial analysis.



Ruskamp is also a Nebraska farmer and CommonGround volunteer who spends her time checking cattle on her family's feedlot. The same observation skills she uses as an EMT help her while doing daily chores. Just like humans, cattle have body language that when read correctly can help a farmer evaluate the animal's situation. Animal body language is perhaps more important than human's because cattle do not have any other form of communication.

"We look at the cattle for visible signs of distress and listen for abnormal sounds. One of the most obvious signs of health is seen in the ears. Cattle normally have a slight upward tip in their ears when they are comfortable and healthy," said Ruskamp of cattle body language.

Signs of illness in cattle can be droopy ears, unusual breathing sounds and loose stools. Ranchers spend time each day looking for these signs in their cattle. If cattle show some of these signs or abnormal behavior, they are removed from the pen to be evaluated and treated if necessary.

"I often think about how the smile on a person can give you the same indication as ears on cattle. When the corners of the mouth are up the person is usually feeling content, just like cattle when their ears are tipped upward," she said. "When the corners of people's mouths and ears of cattle are down, that usually means I want to be careful how I interact with them!"

Ruskamp's volunteer effort with CommonGround includes writing blog posts, which can be found at CommonGroundNebraska.com. CommonGround is a national movement of farm women who share information about farming and food.



District 1
Dave Nielsen
Lincoln, NE



District 6
Dennis Gengenbach
Smithfield, NE

District 2
Mark Jagels
Davenport, NE



District 7
David Merrell
St. Edward, NE

District 3
Curtis Friesen
Henderson, NE



District 8
Jon Holzfafter
Paxton, NE

District 4
Bob Dickey
Laurel, NE



At-large
Alan Tiemann
Seward, NE

District 5
Tim Scheer
St. Paul, NE



Nebraska Corn Board members represent the eight districts indicated on the map and are appointed by the Governor. One at-large member is elected by the other Board members.



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NebraskaCorn.org

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