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is for everyone*

Regional Rewards

North Dakota's
diverse regions
offer a variety
of commodities



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EXPLORE

A CAREER IN

AGRICULTURE



BUSINESS

Business/Marketing and International Agri-Business options prepare students for careers in Ag-related business, banking and finance, Cooperative Extension Service or as an entrepreneur in a self-employed business. Students can also prepare for graduate studies in Agri-Business or Agricultural Economics.



PRODUCTION

Integrated Ranch Management and Integrated Farm Management options prepare students with the skills and abilities necessary to be a successful farmer/rancher or employed in the farming/ranching industry. Opportunities also exist for careers in professional land management.



RESOURCE MGMT.

Natural Resource Management, Range Management and Soil Science options prepare students for careers in both governmental service and private industry. Students are well prepared for careers with the Cooperative Extension Services, NRCS, USFS, BLM and others. In addition, there are opportunities as environmental consultants or in graduate school.



EQUINE

Students who have an interest and an inclination to work in the horse industry should consider the equine option or equine minor. Students have opportunities to focus on management and training. Equine careers include, but are not limited to, horse training, farm/barn management, events management, public relations and sales.

READ ON THE GO

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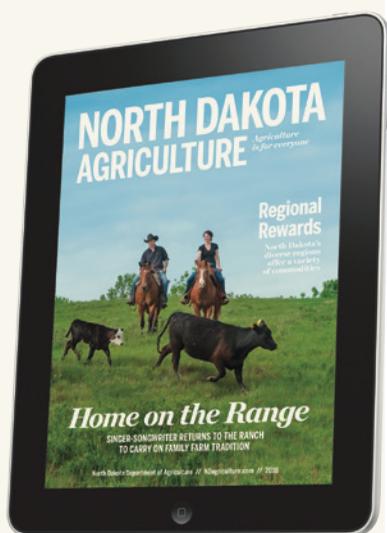
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NORTH DAKOTA AGRICULTURE

Agriculture is for everyone

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On the Cover

There's no place like home for Watford City native Jessie Veeder, who returned to her North Dakota roots at Veeder Ranch.

Photo by Steve Voit



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Commissioner DOUG GOEHRING

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Welcome to North Dakota Agriculture.

Welcome to *North Dakota Agriculture*! Whether you live in our beautiful state or are just visiting, please take some time to get to know our farmers and ranchers.

Agriculture plays a major role in the lives of all North Dakotans. One of our state's largest industries, agriculture represents and encompasses much of our rich heritage and culture. In fact, almost 25 percent of our workforce is employed by agriculture, and 90 percent of our land is used to support it.

This diverse and vibrant industry produces a wide array of products, used here and around the world, thanks largely to the hard work and use of efficient production practices by our 30,000 farmers and ranchers.

It is my hope that by sharing an in-depth look at North Dakota agriculture, you will come away with a greater understanding of just how our farmers and ranchers produce the food, feed, fuel and fiber that we all use every day, and how agriculture works together to make it happen.

For instance, farmers may sell some of their crops to a neighbor to feed their livestock, which then produce manure that goes back on the farmer's fields. It is an intricate balance that industrious farmers and ranchers have been utilizing for generations.

As technology evolves, agriculture evolves along with it. In this magazine, you will learn about some of the cutting-edge technologies that are used in agriculture, including GPS, drones, robotic milking systems and more.

While it's my honor to serve as Agriculture Commissioner, I am also a third-generation farmer. My son and I operate a 2,000-acre, no-till farm near Menoken in south central North Dakota, where we raise corn, soybeans, spring wheat, winter wheat, sunflowers and barley. As farmers and ranchers, we want to show you how agriculture touches all of our lives.

Thank you for your interest in *North Dakota Agriculture*!

Sincerely,

Doug Goehring
North Dakota Agriculture Commissioner

SETTING THE BAR

North Dakota remains a national leader in agriculture

In North Dakota, agriculture is a way of life. As a leading industry in the state, agriculture not only contributes significantly to North Dakota's economy but also the nation's economy, providing jobs and substantial revenue.

Hardworking North Dakotans grow crops and raise livestock on 30,000 farms, spreading across 39.2 million acres, almost 90 percent of North Dakota's total land area. Farmers and ranchers manage a generous amount of land, as the average farm size is 1,307 acres.

North Dakota is a national leader in the production of several important commodities, ranking No. 1 in wheat, barley, canola, flaxseed, dry edible beans, dry edible peas and honey. Wheat is the top commodity for the state, and in 2015, North Dakota produced 370 million bushels, with a production value of more than \$1.79 billion.

North Dakota's varied geography supports its diverse agricultural offerings. The state's eastern Red River Valley region is one of the

most fertile in the world. The region borders Minnesota and is home to the majority of the state's spring wheat, sugarbeets, hogs, dry edible beans, soybeans and corn. The soil in this region is thick black loam, perfect for farming.

Fittingly, North Dakota's state motto is "Strength from the Soil." The Drift Prairie is west of the Red River Valley, and is marked by potholes/wetlands, rolling hills and streams. In the southwestern part of the state, the Badlands present a very different geography. They are exposed surfaces of clay and stone shaped by erosion. Soils here are made of shale, clay, siltstone and sandstone.

But more than crops and commodities, North Dakota agriculture encompasses agritourism activities, value-added processing, exports and agribusiness, innovation, advancements and technology, education and training opportunities for future farmers, and much, much more.

— Rachel Bertone





Photo by Steve Wolt

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FIELD DAY

What better way to learn about North Dakota’s vast agriculture industry than by spending some time on one of the state’s many farms and ranches? Agritourism activities – including pumpkin patches, corn mazes, pick-your-own orchards, farm festivals and more – offer opportunities for just that, teaching consumers about agriculture in a fun way.

North Dakota agritourism ranges from wine trails and buffalo ranch tours to agricultural museums showcasing antique farm equipment and rural bed-and-breakfasts offering guests a relaxing retreat.

Not only do these adventures give consumers a closer look at North Dakota agriculture straight from the state’s farmers, but they also provide the farmers and ranchers an extra source of income.

Discover North Dakota’s agritourism experiences at ndtourism.com/agritourism.



39.2 million

Acres devoted to farming and ranching in North Dakota



In 2015, North Dakota wheat producers earned a **\$1.76 billion** production value by harvesting **7.7 million acres.**

NORTH DAKOTA PRODUCES 92.3 PERCENT OF THE NATION’S FLAXSEED CROP.

LOVE OF THE LAND

With the land as their livelihood, farmers are the original conservationists. North Dakota farmers and ranchers take their environmental responsibilities seriously, implementing best practices to leave the land better than they found it for the next generation.

Farmers and ranchers have adopted specific practices to help with top conservation concerns including energy and the quality of soil, water, air, habitat and water. They’ve done this through techniques, technology, practices and conservation programs. Successful crops begin with healthy soil, water and air, so taking care of the land is imperative to produce the food we eat.

PRIDE OF DAKOTA

Looking for local North Dakota-grown and -made products? Look no further than Pride of Dakota.

Created in 1985, this program identifies products made in North Dakota, including companies that produce food and beverages, manufacturers, publishers, artisans, gift manufacturers, and service providers. The program was founded by former Commissioner of Agriculture Kent Jones, the North Dakota Department of Agriculture and a small group of state businesses. It kicked off with just 20 companies, and today includes more than 500.

Members of Pride of Dakota receive valuable marketing benefits, including export assistance, networking opportunities, use of the Pride of Dakota logo, access to seminars and workshops, retail store promotions, and much more. To be a member, companies must be physically located in North Dakota or produce products in the state.

For more information, visit prideofdakota.com.

Sources: USDA National Agricultural Statistics Service, USDA Census of Agriculture, Ereference.com

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INTERNATIONAL APPEAL

Making its U.S. debut, the Agricultural Bioscience International Conference (ABIC) is coming to Fargo in 2016.

Hailed as the world's top agricultural bioscience conference, ABIC 2016 will focus on "Better Food. Better World." as the theme, concentrating on ways that public and private research comes together to solve issues with science, focusing on the increasing demand for food.

Attendees, which include everyone from students to producers to corporate heads, will hear the latest information on the role that research plays in plant science, animal health, agricultural innovations, and food and health.

The 2016 conference is set for Sept. 18-21. Learn more at abic2016.com.

IN THE PIPELINE

If pipelines are causing you problems, the North Dakota Department of Agriculture is here to help.

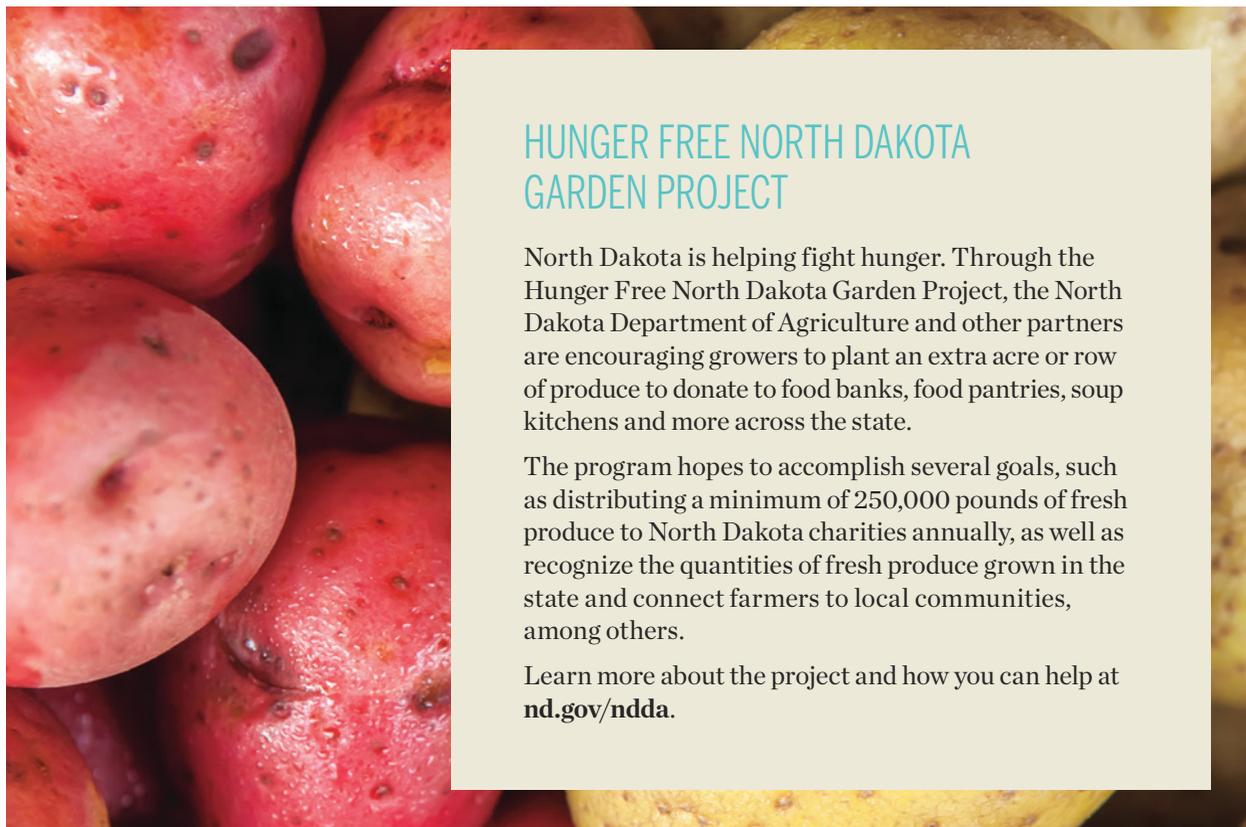
Through the Pipeline Restoration and Reclamation Program, landowners experiencing issues can receive help from an ombudsman. After examining the issue with the landowner, the ombudsman will contact the pipeline company to help resolve the issue in a satisfactory and timely manner.

Also, landowners can receive education through the program on pipeline pathways, soil impacts, installation and other issues.

Learn more about the program by visiting nd.gov/ndda or calling (701) 328-2231.



SUGARBEETS, WHICH ARE MOSTLY GROWN IN NORTH DAKOTA'S RED RIVER VALLEY, PROVIDE MORE THAN 13,000 SUGAR INDUSTRY-RELATED JOBS IN THE STATE.



HUNGER FREE NORTH DAKOTA GARDEN PROJECT

North Dakota is helping fight hunger. Through the Hunger Free North Dakota Garden Project, the North Dakota Department of Agriculture and other partners are encouraging growers to plant an extra acre or row of produce to donate to food banks, food pantries, soup kitchens and more across the state.

The program hopes to accomplish several goals, such as distributing a minimum of 250,000 pounds of fresh produce to North Dakota charities annually, as well as recognize the quantities of fresh produce grown in the state and connect farmers to local communities, among others.

Learn more about the project and how you can help at nd.gov/ndda.

STANDING TALL



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NORTH DAKOTA'S PRINCIPAL AGRICULTURAL COMMODITIES

A glimpse at the state's leading agricultural products

BARLEY

The state ranks No. 1 in the nation for barley production and provides 31 percent of the nation's barley supply. In 2015, North Dakota farmers harvested 1.05 million acres for a \$322.56 million production value.

BEEF CATTLE

The average American eats 114 hamburgers over the span of a year. As of 2016, North Dakota had 904,000 head of beef cattle throughout the state.

CANOLA

North Dakota produces 87 percent of the nation's canola. More than 1.4 million acres were harvested in 2015, earning the state a \$386.26 million production value.

CORN

Corn is believed to be the first agricultural crop grown in North Dakota. With 2.56 million acres of corn for grain harvested in 2015, the state earned more than \$1.05 billion.

DRY EDIBLE BEANS – PINTO

North Dakota is No. 1 in the nation for production of all dry edible beans, as well as pinto beans. In 2015, state farmers harvested 360,000 acres.

FLAXSEED

North Dakota is by far the largest producer of flaxseed in the nation, providing the country 92 percent of the commodity. Farmers earned an \$82.44 million production value with 405,000 harvested acres in 2015.

HONEY

There's something sweet in North Dakota – the state had nearly 600,000 honey bee colonies in 2015. Beekeepers produced 36.3 million pounds of honey in the same year, which earned the state \$65.3 million.

POTATOES

Potatoes are known to produce more pounds of food per acre than any other crop. In 2015, North Dakota farmers harvested 80,000 acres, earning a \$258.4 million production value.

PULSES – DRY EDIBLE PEAS AND LENTILS

North Dakota leads the U.S. in dry pea production and ranks No. 2 in lentil production. In 2015, farmers harvested 538,000 acres to earn a \$150.8 million production value.

SOYBEANS

North Dakota takes the No. 8 spot as a top soybean-producing state in the nation. State soybean producers harvested 5.7 million acres that earned a \$1.56 billion production value in 2015.

SUGARBEETS

Sugarbeets, which are mostly grown in North Dakota's Red River Valley, provide more than 13,000 sugar industry-related jobs in the state. In 2015, the state earned a \$225.1 million production value from 206,000 harvested acres.

SUNFLOWERS – ALL

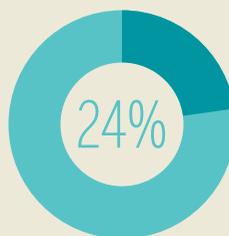
North Dakota ranks No. 2 for sunflower production nationally. Additionally, the commodity is one of the state's top agricultural exports. North Dakota sunflower producers harvested 702,000 acres in 2015, earning a \$220.1 million production value.

WHEAT – SPRING AND DURUM

Chances are high that each time you eat spaghetti there is North Dakota durum wheat in it. The state's climate, rich soil and flat land make it an ideal location for growing wheat. In 2015, North Dakota wheat producers earned a \$1.76 billion production value by harvesting 7.7 million acres.



THE STATE IS NO. 7
IN THE NATION FOR
BISON INVENTORY.



The percentage of
North Dakota's population
employed by agriculture



30,000

Number of family farms and
ranches in North Dakota

Sources: North Dakota Department of Agriculture, USDA National Agricultural Statistics Service



The Messer family of Beaver Creek Ranch is passing family farming traditions to the next generation.

Photo by Steve Witt

STRENGTH *in Family*

Generations of North Dakota farmers and
ranchers carry on traditions

BEEF

A NORTH DAKOTA FAMILY TRADITION



· ABOVE ALL ELSE ·

BEEF



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North Dakota Beef Commission

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Both the Messers (left) and Vogels (right) carry on their family traditions.

Farm family roots run deep in North Dakota, often growing around a legacy built across generations. For many, the agricultural way of life is a family affair, one united with pride in the land and tradition.

LIKE FATHER, LIKE SONS

In Richardton, the Messers of Beaver Creek Ranch carry on an agricultural tradition started by a great-grandfather in the late 1800s. Jerry Messer and three of his five brothers tend to the responsibilities of the business their parents began not long after they were married in 1951.

Phillip and Betty Messer built Beaver Creek Ranch from the ground up while raising a family of six boys and five girls. Jerry and his brothers, Mark, Greg and Scott, each manage a specific part of the operation that was assigned to them when they were old enough to start working on the ranch.

“Bottom line, my dad always emphasized diversification and wanted us working together,” Jerry says. “As we grew up, we had the opportunity to be a part of an enterprise. I’m in charge of dairy, Mark is in charge of beef, Greg is in charge of row crops and grains, and Scott is in charge of the feedlot and trucking.

“That’s how we’ve always done

it,” he adds. “This gives us the opportunity to do more things we normally couldn’t do and lets us channel our energy where it needs to be at the time.”

The Messers are also using today’s technology to improve upon their family’s legacy. Their use of GPS systems has helped to cut down on labor costs, and they also practice other types of precision agriculture. All their calves are ID-tagged and registered with the Red Angus Association.

The technical side of the operation is typically handled by Greg’s sons, Josh, Jadon and Travis, and Scott’s son, Dakota. They have full-time jobs elsewhere but still help on the farm.

“It’s a great way of life for us, that’s all there is to it,” Jerry says.

HOMAGE TO ANCESTORS

Whitney and Justin Vogel might call it a labor of love. When the couple married in 2011, they moved to the homestead of Justin’s great-great-grandfather to start their new life together. A long list of repairs and updates lay before them.

“Things had kind of fallen apart,” Whitney Vogel says of their property, Vogel Shorthorn Farm in Rogers. “There was a lot of work that had to be done both in the yard, on the farm and in the house we live in now. We struggled to get things going again, and there’s still some

work that has to be done, but we didn’t want to let it go. We didn’t want the work to prevent us from keeping it in the family.”

Both Whitney and Justin come from a bloodline of farmers and ranchers, each growing up with a passion for agriculture. Justin attended North Dakota State University after high school, but he knew he wanted to return to the family farm when he finished. “He would drive back on weekends to help with things like planting and harvesting,” Whitney says.

Whitney was involved in 4-H, influenced by her grandfather, who owned Hauxdale Shorthorns and was well known in the North Dakota cattle world. Together the couple has revived her grandfather’s operation, and now run both the Vogel Shorthorn Farm and Hauxdale Shorthorn Farm.

“When I started getting interested in cattle and going to sales and things, we would run across people that remembered my grandpa, so we kind of felt we should keep that business,” Whitney says.

– John McBryde

i Learn more about family farms thriving in North Dakota at NDagriculture.com.





REGIONAL SUCCESS

North Dakota's prominent regions offer a variety of commodities

North Dakota agriculture is vital to providing food, feed, fiber and fuel for citizens of the state, country and world. But you might not realize just how diverse North Dakota's industry is – the state produces at least 50 different types of agricultural commodities, and 90 percent of total land area is used for agriculture. Thanks to distinct regions with varying geographical benefits, North Dakota

farmers and producers are able to grow and raise a wide variety of commodities.

RED RIVER VALLEY

Located along the eastern edge of North Dakota, the Red River Valley region is known for fertile lands, due to its close location to the Red River. It is broad and flat, and contains thick black loam soil, making it one of the

NORTH DAKOTA
*Specialty
Crops*



*Diverse &
Abundant!*



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richest agricultural areas in the world. The region also provides a climate of warm days and cool nights, which is ideal for several root crops.

Some of North Dakota's most prominent commodities are grown here, including soybeans, sugarbeets, spring wheat, dry edible beans and most of the corn for grain, though corn is grown in other parts of the state as well. In 2014, several Northeast counties in this region combined produced a total of 2.9 million tons of sugarbeets – the most in the state. The region also contains a high concentration of hog farms.

DRIFT PRAIRIE

The Drift Prairie region's soil is actually called "drift," consisting of a mixture of clay, sand and gravel. Prominent commodities of this region include honey bees and honey, and grain farming including

spring wheat, canola and barley, as well as soybeans, dry beans and corn. North Dakota ranks No. 1 in the nation for canola and honey production, as well as spring wheat. In fact, the state produced 53.3 percent of total U.S. spring wheat production in 2015.

MISSOURI COTEAU

The Missouri Coteau region of North Dakota extends east from the Missouri River to the edge of the Drift Prairie region. The eastern border of the region has lots of wetlands that diminish as it gets closer to the Missouri River. Commodities produced in this region include durum wheat, lentils, oats, flaxseed, honey bees and honey, and dry edible peas.

MISSOURI SLOPE AND BADLANDS

Livestock grazing is dominant in the Missouri Slope region, which

features buttes occasionally rising above the landscape. Beef cattle, dairy cattle and sheep are raised in the region. It also supports alfalfa production used as livestock feed, as well as one of the state's most well-known crops – sunflowers. North Dakota is No. 2 in the U.S. for both oil and confection sunflower production, producing a whopping 1.06 billion pounds of sunflower seeds in 2015. Honey bees are also raised in the region, along with potatoes in the upper northwest corner.

Located within the Missouri Slope, the Badlands are exposed surfaces of clay and stone that have been carved into beautiful formations due to erosion. The area's soil contains lots of clay, as well as steep slopes and a high probability of erosion. There is some honey bee production in the region.

– Rachel Bertone

MANY COMMODITIES ARE PRODUCED ACROSS NORTH DAKOTA. THIS MAP SHOWS THE HIGHEST CONCENTRATIONS THROUGHOUT THE STATE.



Source: USDA National Agricultural Statistics Service



Photos by Steve Witt



NO PLACE LIKE HOME

Watford City native Jessie Veeder
returns home to her family's ranch



From a young age, singer-songwriter Jessie Veeder dreamed of settling down in her hometown of Watford City – she just wasn’t sure how to make that happen. But she knew she belonged in the Badlands, and thanks to a lot of hard work and a little luck, she’s living her dream today.

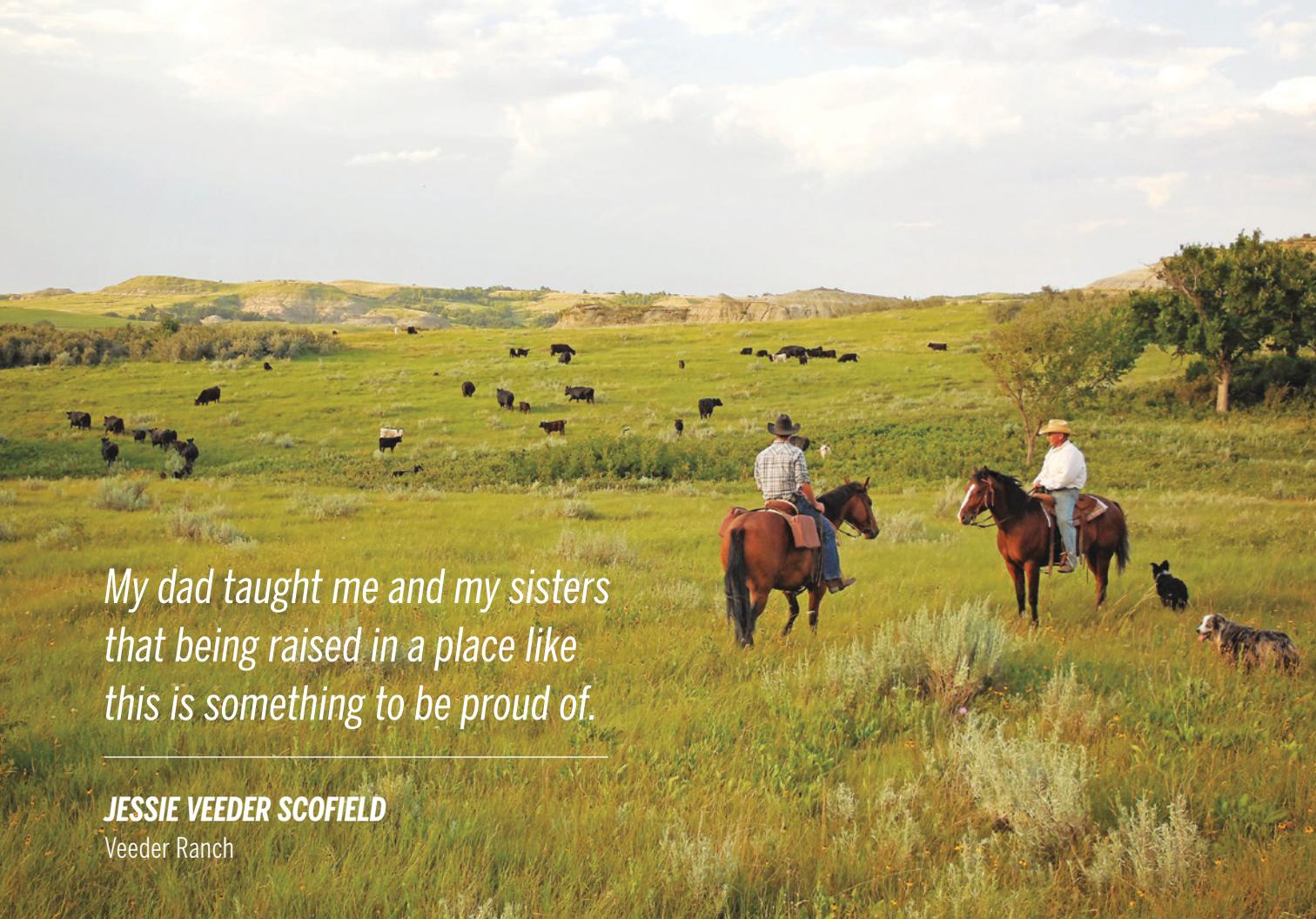
“I’ve always had a love for the place where I grew up and music and writing,” Jessie says. “I spent a lot of time trying to merge those things so I could build a career and live where I wanted to live. My husband grew up in Watford City, too, and we knew we wanted to come back here and raise a family in the place we love so much.”

FROM HERE TO THERE AND BACK AGAIN

Jessie grew up on Veeder Ranch, a small cattle ranch her great-grandfather founded 100 years ago. Her father, Gene Veeder, was also raised on the ranch, and he eventually took over the operation while working “in town” and pursuing his own musical interests. Because Jessie spent so much time with her father as a child, it’s no surprise she fell in love with the same things he held dear.

“I grew up helping my dad on the ranch and singing alongside him,” Jessie says. “He encouraged me to play the guitar and write, and that’s when I started writing music.”

Jessie’s first original album debuted when she was 16 years old, and while attending the University of North Dakota in Grand Forks, she was hired by a Nashville agency to perform in cities across the Midwest. Most of her songs were about life on the ranch, something she says she’s always been proud of, which – like so many other things in her life – stems from her father.



My dad taught me and my sisters that being raised in a place like this is something to be proud of.

JESSIE VEEDER SCOFIELD

Veeder Ranch

“My dad taught me and my sisters that being raised in a place like this is something to be proud of,” Jessie says. “It’s unique – there aren’t a lot of people who get to experience this kind of rural living. It’s something my dad was so proud to have kept in the family.”

After graduating with a degree in communications, Jessie married her childhood sweetheart, Chad Scofield, in 2006. Shortly after, the couple moved to Missoula in Montana, and in 2008, they relocated to Dickinson so Chad could pursue a career in the oil industry. However, when Chad got a job offer closer to the ranch in 2010, they jumped at the chance to return to their roots.

Jessie and Chad are now living the life they once dreamed of. The couple built a house on the ranch,

and in November 2015, they welcomed daughter Edie to the family.

LIFE IN WATFORD CITY TODAY

While both Jessie and Chad work on the ranch regularly, serving as the fourth-generation stewards of the land, they both have off-the-ranch jobs. Chad still works in the oil industry, and Jessie is growing her career as a writer, public relations specialist, photographer and musician.

Jessie says it would have been difficult to move back to the ranch without the oil industry creating so many opportunities, and although she’s grateful, she describes it as bittersweet. After all, her once-small town is now a bustling community, thanks to the influx of people who have arrived

to fill the many available jobs.

But Jessie has drawn inspiration from the changes, creating new music, performing and starting a successful blog, and she now writes a weekly column chronicling her experiences on the ranch for newspapers distributed across the state – all while mothering Edie, herding cattle and bottle-feeding one of the ranch’s newest calves.

“Every teenager wants to get out of their hometown, and I was no exception,” Jessie says, adding that she knew she wanted to return someday. “But my dad had an unwavering love for the ranch and the community, so it was hard for it not to rub off on me, and I’m still in awe that I get to live here.”

To find out more about life on the ranch, visit veederranch.com.

– Jessica Walker Boehm

Left: Jessie Veeder Scofield and husband, Chad, returned to their North Dakota roots; **Right:** Chad Scofield and Gene Veeder check on cattle.



UNITE AND CONQUER

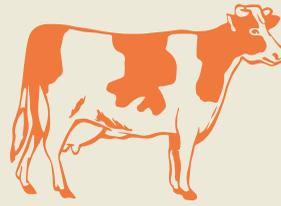
Dairy, soybean, wheat collaboration
is a win-win for North Dakota producers



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Wheat accounts for close to 50 percent of North Dakota's planted acres.



The average North Dakota dairy cow produces about 6 gallons of milk per day, or more than 2,200 gallons in a year.

THE ONLY BEANS WITH COMPLETE PROTEIN, SOYBEANS ARE USED FOR FOOD, ANIMAL FEED AND HUNDREDS OF INDUSTRIAL APPLICATIONS.



North Dakota is No. 1 in the nation for production of spring and durum wheat.

5 North Dakota has **five plants** that process one or more dairy products.



NORTH DAKOTA PRODUCES ENOUGH SOYBEANS TO MAKE **471 BILLION CRAYONS** EACH YEAR.

IN NORTH DAKOTA, THERE ARE ABOUT 90 LICENSED DAIRY HERDS PRODUCING 38 MILLION GALLONS OF MILK EACH YEAR.

No. 8 North Dakota ranks No. 8 in the U.S. for soybean production.

Sources: North Dakota Department of Agriculture, Midwest Dairy Association, USDA Census of Agriculture (2012), USDA National Agricultural Statistics Service

Third-generation dairy farmer Harvey Hoff knows a thing or two about the importance of farm-to-farm relationships. He and his wife, Janal, own about 250 cows and milk 110 on their farm in Richardton. Hoff grows barley and oats for feed on the couple's 1,000 acres of land, but when it's time to buy straw for bedding, he looks no further than his neighbors.

GOOD NEIGHBORS

"I purchase a lot of my straw for bedding from a neighboring wheat farmer," Hoff says. "We're purchasing about 400 big round bales a year for bedding purposes. We've got a good agreement."

This interdependent relationship between animal and grain producers has become the lifeblood of agricultural vitality. Farm-to-farm trade provides an additional revenue source, cuts costs, ensures quality and promotes environmental sustainability.

"Another advantage is availability. I don't have a lot of storage, so I'm able to work one on one with them and go get the straw when I need it. It's pretty hard to do that with somebody a couple hundred miles away," Hoff says.

Wheat producers have also benefited from the relationship with animal producers. Wheat bran is often integrated into the dairy cattle diet, and wheat straw is a preferred bedding material for livestock.

"One of the advantages of wheat over some of the other (grain) crops is that its straw is very good for bedding of any livestock," says Jim Peterson, marketing director for the North Dakota Wheat Commission. "Its absorption nature, ease of use, per-pound cost and the fact that it's biodegradable make it a favorable choice."

As for some wheat producers, Peterson says straw can become a residue burden, especially during



strong production years, so having an outlet for excessive straw is beneficial, as well as financially profitable.

"It's a profit center for some producers, especially on a low-price year for the grain itself. It can certainly add to the net dollar returns per acre," he says. "From a transportation cost, since straw is not as dense as other bedding options, staying local is certainly the route to go."

PROFITABLE PARTNERSHIPS

Animal agriculture serves as an alternate source of revenue for producers growing other crops, especially soybeans.

"It's important for the state's soybean producers to have dairy farmers as a customer for meal component of the soybean," Tyler Speich, chairman of the North Dakota Soybean Council, says.

Soybean meal is left after the oil extraction process and is an abundant source of protein. Producers also rely on the dairy industry as an outlet for many of their other nutrient-dense byproducts.

Terry Entzminger, owner and partner of Entzminger Dairy, located southwest of Jamestown,

raises about 850 dairy cows and 800 replacement heifers. The Entzmingers grow all of their own forages and grains for the dairy under their cropping enterprise, but since animal agriculture has transitioned into co-product based diets, byproducts make up a large percentage in his cattle's diet.

"On our farm we feed several North Dakota byproducts including potato waste from the Jamestown Cavendish plant, dried distillers from Dakota Spirit AgEnergy in Spiritwood, canola meal from ADM in Enderlin as well as sunflower screenings from multiple sources," Entzminger says. "Animal agriculture plays an important role in and relies heavily on the cropping industry for our needs, and the grain industry also benefits greatly from having us as a major customer. Not only are we utilizing the cropping industry's product, we also add to their bottom line through local demand and utilization."

– Teree Caruthers



CLASS IS IN SESSION

Ag-related education opportunities give boost to industry

When it comes to capturing the attention of fourth-graders, visual demonstrations are a creative and engaging tactic.

That's what organizers of the Living Ag Classrooms program have long understood in presenting their farm-to-fork message to 9- and 10-year-olds in schools throughout North Dakota. The program began in Minot in 1995 and was such a success that the organizers expanded it into Fargo in 1997 and Bismarck in 2003. The program is held once a year in the Minot, Fargo and Bismarck areas incorporating their respective surrounding schools. These learning experiences are targeted

at fourth-graders whose school curriculum covers the history and culture of the state.

Well over 4,000 students and 230 teachers turn out each year to attend these events.

Presenters at these events represent 12 to 15 different commodity groups and agricultural organizations, and use easy-to-understand visuals or hands-on activities to impart their lesson. They help bring a "real-world" exposure to the students, says one of the program's participants.

"A lot of kids thought that milk just came from the store and didn't have any idea of the connection to the dairy cow," says Nancy Jo Bateman, executive director of the North Dakota Beef Commission

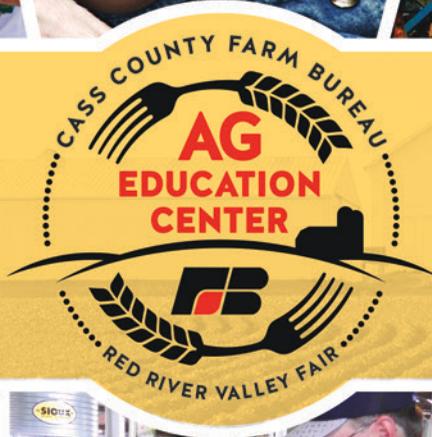
North Dakota children can get hands-on ag experiences through Living Ag Classrooms and fairs.







Red River Valley Fair
Association



BIG IRON
FARM SHOW

RED RIVER VALLEY FAIR
Annually in July
redrivervalleyfair.com



Red River Valley Fairgrounds
West Fargo, ND
701.282.2200

BIG IRON FARM SHOW
Annually in September
bigironfarmshow.com



who has been involved in Living Ag Classrooms since it began. “They thought honey was just something sweet and didn’t realize bees were involved.”

EYE-OPENING EXPERIENCES

In addition to being introduced to various commodity groups and dispelling common misconceptions, students learn about agriculture.

Some displays, for instance, demonstrate the four F’s of corn (food, feed, fuel, fiber), or show how bubble gum comes from the inner lining of a pig’s stomach. Bateman’s beef booth has a similar approach.

“We start by talking about how there are two to three times the number of cattle in our state as there are people,” she explains. “Then we’ll talk about all the different cuts of beef that they might enjoy and where they come from, and then about nutrition and food safety. We’ll end by showing other things that we get from cattle in addition to food. They usually think that’s pretty eye-opening.”

Bateman estimates that over 88,000 fourth-grade students have visited a Living Ag Classroom in North Dakota. Some of the very first students that ever attended are now parents with their own fourth grade

children participating in the event.

Ag-related education and showcase opportunities are available in other ways as well, including the Red River Valley Fair, North Dakota State Fair and numerous county fairs held throughout the state.

The Red River Valley Fair is held annually in July in West Fargo. The Red River Valley Fairgrounds includes a 16,000-square-foot Ag Education Center that opened in 2009. It is designed to educate any of the 110,000 fairgoers who attend the fair each year, teaching them about agriculture and where their food comes from. The focus of the center is farm-to-fork.

“The Ag Education Center is one stop for everything education-related,” says Katy Stenerson, sponsorship and marketing coordinator for the fair. “We have live animals, and that includes beef, dairy, sheep, swine, goats and poultry. We also have a lot of North Dakota and Minnesota crops such as soybeans, corn, wheat, barley, sugar beets and sunflowers.”

New to the center is a hands-on demonstration table where volunteers give demonstrations on how to cook or make a product, using some of the items found in the building.

– John McBryde



NORTH DAKOTA STATE FAIR

The North Dakota State Fair is the place to showcase agricultural education in North Dakota. For over 50 years, FFA and 4-H members have been exhibiting their best projects and accomplishments and showcasing the skills and abilities learned in agricultural education. Many spend long hours nurturing and growing top-quality crops and premium livestock, designing and building outstanding exhibits, creating beautiful artwork, writing thoughtful essays and much more.

“The North Dakota State Fair showcases the youth of our state and their accomplishments and recognizes them for their contributions,” North Dakota Agriculture Commissioner Doug Goehring says. “It encourages them to continue their involvement in agriculture.”

The State Fair is also the place to see innovations in the world of agriculture technology and equipment. Fairgoers can investigate everything from state-of-the-art computer software to the latest and largest combines and more.

>88,000

More than 88,000 fourth-grade students have taken part in a Living Ag Classroom.



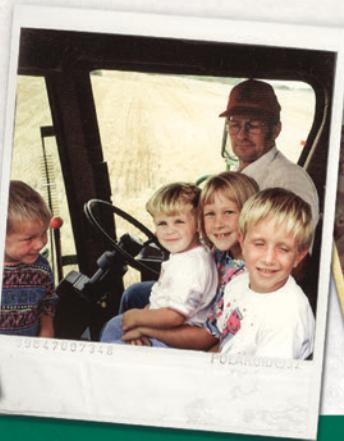
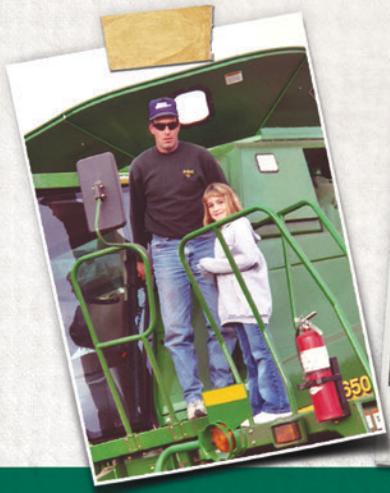
Living Ag Classroom events are held January through April.

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in the

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A Growing SPECIALTY

Specialty crops are an important focus of North Dakota agriculture's future

Something special is growing in North Dakota, where innovative industry researchers and leaders are working to help the state flourish even more as a leading specialty crop producer in the U.S.

"North Dakota produces over 50 different commodities commercially and leads the nation in the production of many of them, including specialty crops such as dry edible beans, dry edible peas, lentils, potatoes and honey," says Emily Edlund, who handles the Specialty Crop Block Grant Program through the North Dakota Department of Agriculture (NDDA). "We are now the eighth-largest exporter of agricultural products in the nation. In the last 10 years, we have increased our footprint from exporting to 63 countries to 83 countries in 2015."

RESULTS FROM RESEARCH

At the North Dakota State University North Central Research Extension Center in Minot, a number of research activities are underway to enhance state specialty crop production, according to director Ken Grafton. Local research helps to address yield, disease and pests of specialty crops, which includes fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops.

Some projects are looking into plant breeding, including developing plant varieties that grow better in North Dakota's land and climate. Plant pathology is being studied to understand and mitigate diseases that impact specialty crops.

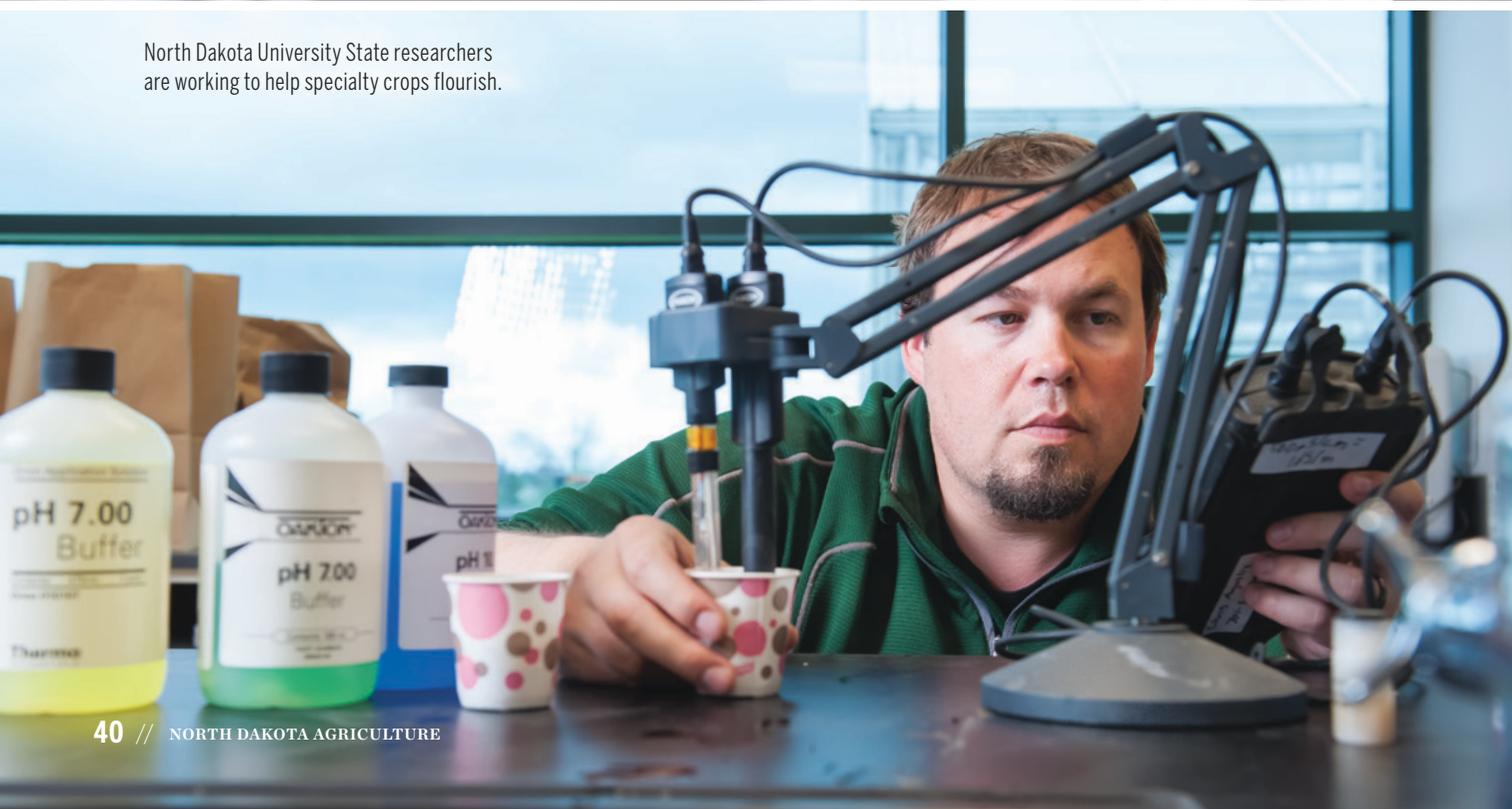
Innovative ag research for specialty crops is underway at the NDSU North Central Research Extension Center.



Photos by Steve Voit



North Dakota University State researchers are working to help specialty crops flourish.





Left: Potato research is a hot topic at the North Central Research Extension Center. **Right:** The Center grew and researched brassica carinata, or Ethiopian mustard, as a promising crop that could contribute to bioenergy production. It's similar to canola.

Potato breeding and pathology is a big focus as well. “For example, some grant money was used to research dry beans – pintos, in particular – to reduce the after-harvest darkening,” Grafton says. “That could be a huge economic benefit to dry bean producers in the state.”

Grafton credits the Specialty Crop Block Grant Program with helping state farmers significantly increase acreages of specialty crops, thanks to the research occurring through the university.

“It’s exciting seeing a number of different specialty crops taking hold of significant acreages,” he says.

GETTING WITH THE PROGRAM

To help specialty crops flourish across the nation, the United States Department of Agriculture (USDA) created the Specialty Crop Block Program more than a decade ago, with grants distributed through state agricultural departments. Since 2006, NDDA has awarded more than \$9 million to 133 projects to benefit the specialty crop industry as a whole.

NDDA executes the program on behalf of USDA.

The funding has supported a significant increased production of specialty crops throughout the state, Edlund says.

“Fresh vegetable exports have doubled since 2006 and production of pulses such as lentils has grown five times,” she says. “This funding has encouraged North Dakota producers to grow more specialty crops, helping them to diversify their operations and giving them export opportunities. As the middle-class population in developing countries is set to reach record levels by 2020, North Dakota producers

growing specialty crops such as pulses have the opportunity to export them to a world market that is demanding them.”

Along with research and expansion, the program is important to help educate farmers.

“The program helps teach young farmers about why these crops are important, and provides research to help them be more efficient when it comes to growing them,” Edlund says.

SPECIAL EXPORTS

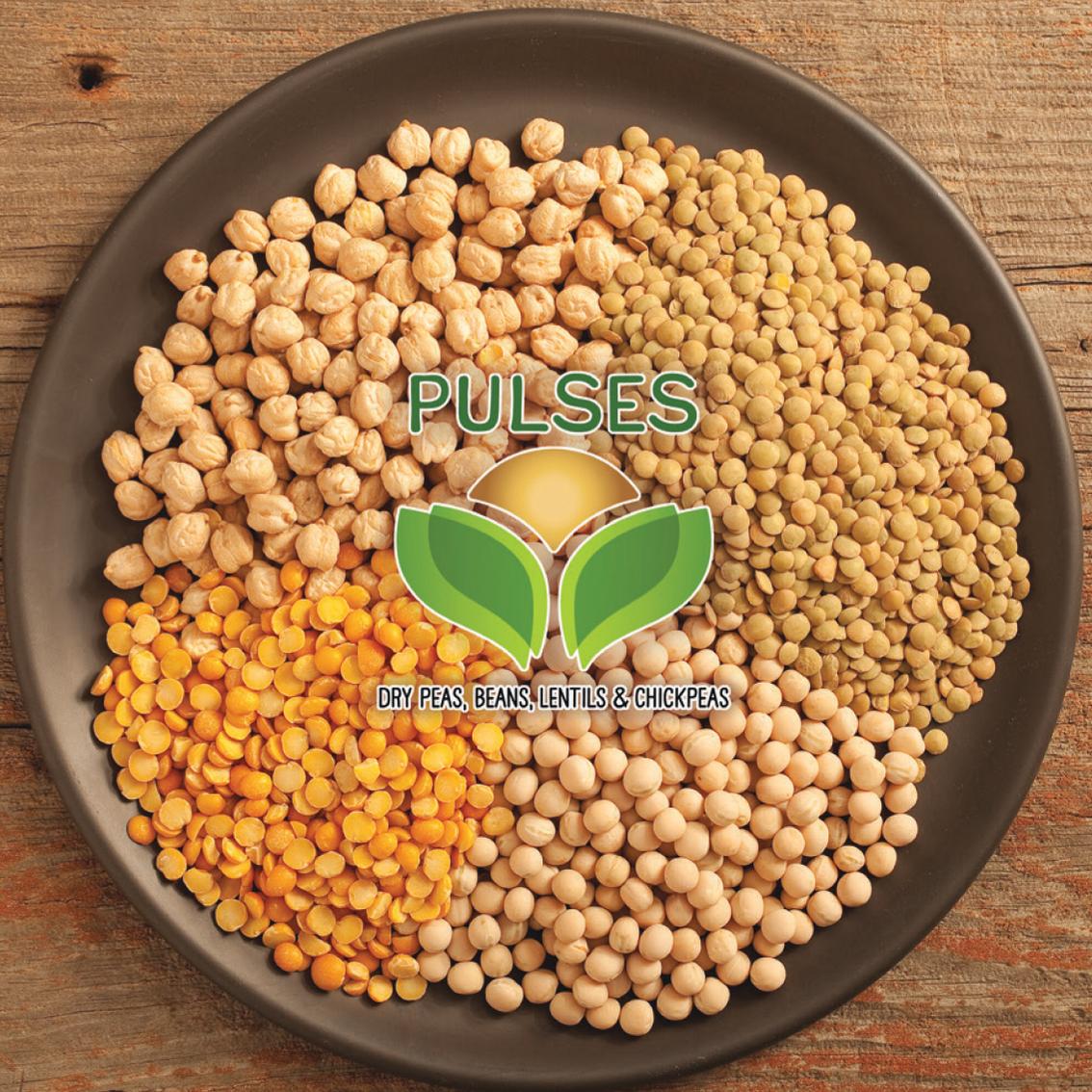
North Dakota leads the nation in agricultural exports, and that includes many specialty crops. The state is the top exporter of dry beans, sunflowers, peas and lentils, among others.

The North Dakota Trade Office’s specialty crop program focuses on helping state farmers export those crops around the world, giving them more global visibility and reimbursing expenses.

“The intent is to get companies into new markets or expand their presence in a market,” says Dean Gorder, executive director of the North Dakota Trade Office.

According to Gorder, some crops – such as soybeans – are not considered specialty crops by the USDA, but can be marketed as such by the NDTO when grown using non-genetically modified (non-GMO) seeds or as an identity preservation (IP). IP crops are niche products with an intended end use. For example, a Japanese importer may have strict requirements of wanting to know the source of seed, where the crop was planted and from which farm it was harvested.

– Brittany Stovall



The United Nations has declared 2016 as the International Year of the Pulses. Help us celebrate the uniqueness of pulse. Pulses – as healthy to eat as they are to grow.

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PULSES

THE YEAR OF THE PULSE

North Dakota has a role in the International Year of Pulses

As major producers of lentils, peas, beans and other pulse crops, North Dakota farmers have their fingers on the pulse of the world.

With the United Nations declaring 2016 as the International Year of Pulses, North Dakota producers and organizations are spreading the word about the many benefits of growing and eating pulse crops, which are grain legumes. The state is a major producer of pulses, a group that consists of 12 different kinds of crops including dry beans, dry peas, chickpeas and lentils. North Dakota ranks No. 1 for dry edible beans and dry pea production, as well as No. 2 for lentils.

Pulses are full of nutritional benefits, says Shannon Berndt, executive director of Northern Pulse Growers Association.

“They are a great source of protein, fiber, iron and are high in antioxidants,” she says. “As well as being healthy, pulses are extremely versatile. They can be consumed as a whole food or included in products through pulse flours, proteins or starches.”

Well-known pulse dishes are hummus and falafel, which use chickpeas. However, pulses can be found in baked goods, pasta, snacks and beverages, adding nutritional value.

“Pulses are very versatile,” says Natsuki Fujiwara, food scientist at Northern Crops Institutes. “One interesting example is making a whipping cream from water that pulses were cooked in. It whips up just like cream and is 100 percent vegan. It has a very neutral flavor as well.”

Economically, pulse crops are flourishing both nationally and in international export markets. Together, North Dakota and Montana make up the largest pulse-production region in the nation at 80 percent.

“Even though the production scale is much smaller compared to the other major crops, it has a great value to producers due to increasing cash prices along with the demand from export markets such as India, Southeast Asia and Latin America,” Fujiwara says.

She adds, “In the domestic market, the significance of pulses

is on the rise due to niche markets and the potential specialty market for younger generations such as millennials who are a driving force of the food market and tend to have a unique perspective on their diet. In contrast, the export market tends to evolve among developing countries where the growing middle class is looking for a nutrient-rich diet.”

Pulse crops are also sustainable to grow, making them a good option for rotational crops.

“Pulses provide many agronomic benefits to producers, including improving soil and providing a break in disease cycles. And they are nitrogen fixing,” Berndt says. “Research has shown that including pulses in a rotation can have significant increases on yields of subsequent crops.”

“They use less natural resources, too,” Fujiwara adds.

To learn more about pulse crops or find recipes, visit northern-crops.com or northernpulse.com. Become involved with the International Year of Pulses at fao.org/pulses-2016.

– Brittany Stovall

The Farmer's Life for Me

North Dakota couples build their farms from the ground up

Jonathon and Hannah Moser aren't your typical American farmers. Both North Dakota natives, the couple met in college while he was studying to be an accountant and she was preparing for a career in marketing and communications.

"My dad was an airplane mechanic, but when I was 9, he bought a 30-acre farm in Streeter," Jonathon says. "We moved here, and I spent 16 years on the farm, though I was never interested in farming. But after getting my degree in accounting, I had a quarter-life crisis and realized I needed to get my hands in the dirt."

After Hannah graduated college in 2012, the couple had a rare opportunity to travel to Australia for five months to manage a vegetable operation for a farmer whom Jonathon had met and worked for on a previous trip to Australia.

"I had no intentions of becoming a farmer," says Hannah, who grew up in Hazen. "Jonathon and I had dated for two years before we went to Australia, and we had gardened together and loved growing our own food. Once we were there, I wondered what I had gotten myself into. But soon I realized I really enjoyed it."

The couple moved back home to North Dakota and married in 2014. They started their own vegetable-growing operation, Forager Farm, on the Streeter farm where Jonathon's dad and brother run a cow-calf operation.

"It works out well because although we are separate operations, we are able to share equipment with my dad, and we give them veggies, and they give us beef," Jonathon says. "We've had to borrow or rent a tractor in the past, but we finally bought one of our own this year."

COMMUNITY SUPPORTED AGRICULTURE

Now in their third season, the Mosers deliver fresh, seasonal vegetables to 85 Community Supported Agriculture (CSA) members throughout the spring, summer and fall. They grow radishes, broccoli, kale, chard, lettuce, spinach, cucumbers, zucchini, tomatoes, peppers, eggplant, herbs, root crops, and cabbage and cauliflower, to name a few.

"We've gotten a lot of compliments on our butterhead-style lettuce, which happens to be the best lettuce we've eaten in our lives," Jonathon says. "We

North Dakota natives Jonathon and Hannah Moser abandoned previous career plans after they were inspired to start Forager Farm in Streeter.





also grow three varieties of pumpkins, and our favorite variety has a sweetness to it that doesn't require adding a lot of sugar in recipes like pumpkin pie."

Their goal is to help reinvigorate food culture in North Dakota.

"We're teaching people what's in season in North Dakota and sharing the quality of food harvested and delivered the same day," Jonathon says. "We like food, and we know fresh is best, so we enjoy offering that to our members. We email members weekly with pictures and labels of what's in their box that week, and we include recipes and tips on how to use different vegetables."

Forager Farm also produces vegetables for the Jamestown Public School District as part of the North Dakota Farm to School Program.

Though rewarding, farming isn't without challenges.

"It can be isolating," Hannah admits. "We have friends from college who don't understand the farming lifestyle. We don't have extra cash lying around to spend, and since we're an hour away from any entertainment, we can't just meet up with a friend for a drink."

Nonetheless, they both agree the perks of farming outweigh the obstacles.

"Our CSA members have been very supportive, and they think what we do is admirable," Jonathon says. "We get to talk and connect with the people feeding our food to their families, which is wonderful. Plus, we love working outdoors at sunset. You can't beat that wide horizon with the sun setting on it."

VAN BEDAF DAIRY

Corne and Conny Van Bedaf of Carrington also gained agricultural experience abroad before building their dairy farm in North Dakota. Originally from the Netherlands, the couple owned a 50-cow dairy for 10 years in their home country before moving to Canada in 2001, where they milked 120 cows for another seven years.

In 2008, Corne, Conny and their three children – Piet, Dries and Maartje – moved to Carrington, where they built Van Bedaf Dairy LLP. With help from their 18 employees, the family milks 1,500 dairy cows three times daily and ships two semi-loads of milk every day to the Cass-Clay plant in Fargo. Their milk is sold in groceries all over North Dakota and western Minnesota.

"We chose North Dakota because it has a great climate and many opportunities for livestock farmers," Conny says. "There is a lot of land available to grow feed as well."

From top: It's the farmer's life for the Mosers at Forager Farm, where they grow a variety of vegetables and raise goats, among other animals.

Oldest son Piet joined his parents in the dairy after graduating college with a degree in ag economics. Son Dries is studying animal science and plans to join Van Bedaf Dairy as well. Daughter Maartje plans to become a nurse.

“As the boys got older and showed interest in the dairy, we made the move to expand it so we could support three families with one dairy,” Conny says. “Also dairy farming is a 24/7 job, and when you expand, you’re able to hire people to help you so you can take a weekend off. We hoped our kids would be able to enjoy the same lifestyle we do – working with animals and the land to provide a living. It’s something special.”

In 2012, Van Bedaf Dairy was awarded the Agriculture Commissioner’s Dairy Producers Award for Excellence for its high quality standards. Conny enjoys seeing the process of their milk being shipped from the dairy and then coming back to local grocery stores.

“I go to the grocery and see people buying our milk, and that feels great,” Conny says. “We have an awesome community in Carrington. We work with the local 4-H program. Agriculture is a very personal thing in North Dakota. The community supports us, and we support them in return.”

– Jessica Mozo



We hoped our kids would be able to enjoy the same lifestyle we do.

CONNIE VAN BEDAF

Co-owner of Van Bedaf Dairy

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Helping Hands

Agricultural Products Utilization Commission helps create wealth, jobs in the state

The innovative spirit of farmers, ranchers and agribusinesses alike is alive and well in North Dakota. And for almost four decades, the Agricultural Products Utilization Commission (APUC) has been helping fund marketing, product development and diversification projects for hundreds of agribusinesses and innovators.

Established in 1979 by the North Dakota Department of Commerce's Economic Development & Finance Division, the program has played a hand in helping strengthen the economy and ensure the vitality of the state's agriculture industry. Every two years, the program invests between \$3 million and \$5 million in grant funding to some 100 companies – companies such as BisMan Community Food Co-op in Bismarck, which brings together local producers to sell directly to consumers who purchase membership rights to portions of

the farmers' crops each quarter, providing an additional revenue source for family farms.

HELPING CONNECT FARMERS TO NEW MARKETS

The APUC grant helped the fledgling co-op hire an outreach coordinator and conduct a feasibility study to gauge interest.

"It was just phenomenal," BisMan General Manager Randy Joersz says. "The overwhelming response from the study was that people wanted more out of their food and they wanted to know where their food was coming from. People wanted the local food."

The BisMan Co-op was established in 2013 with some 300 memberships and has quickly grown to include more than 1,700 members. It works with 20 fruit and vegetable producers, as well as local and statewide beef, pork, lamb, and even buffalo producers.

"The producers we're working with are just remarkable. They raise



Growing Strong

APUC grants help North Dakota agriculture flourish in many ways.

their products organically and with non-GMO feed,” Joersz says.

HELPING TO PROMOTE AG

Another company that took advantage of APUC funding is Prairie Roots Co-op in Fargo. Kaye Kirsch, marketing director for the co-op, says the APUC was an instrumental partner in bringing Prairie Roots Food Co-op to the Fargo region. The co-op is slated to open in early 2017.

“They funded our initial feasibility study when the co-op was just an idea in a few minds, and provided marketing resources to grow our membership and launch our store,” Kirsch says.

The co-op works with dozens of local producers to create strong connections between farmers, ranchers and consumers through education and promotion. The co-op store will feature informational placards on its products to show where and how food was grown, host in-store events, and produce “Meet Your Farmer” events with guest speakers and cooking demonstrations.

“Because food co-ops are locally owned and have strong ties to the local farmers and ranchers, they do a great job of telling the story of the farmers and the farms where the food is grown,” Kirsch says.

HELPING VALUE-ADDED PRODUCERS STAY STRONG

John Schneider, APUC director, says promotion of the state’s agriculture industry is one of the main missions of the grant program, as is economic vitality.

“When the APUC was established in 1979, North Dakota was shipping a lot of raw agricultural commodities out of the state and letting other states and other companies add value to it. Our farmers weren’t really reaping the benefit of value added,” Schneider says. “The APUC was established to help companies –

particularly value-added companies – start up and find ways to use our raw agricultural commodities.”

Schneider says most companies that apply for the grants use the funds for marketing efforts – market plans, feasibility studies and actual promotion.

The APUC program offers grants within seven different categories, including biodiversification, value-added food processing, agritourism and technology. Schneider cites as an example the investment in ethanol plants around the state,

which he says has helped raise the base price of corn.

“I think in North Dakota as a whole, having those facilities here and utilizing North Dakota-grown corn, it saves them money so they can offer a little higher price to the farmers who are delivering it,” he says. “That’s really our mission – helping value-added businesses that in turn help the farmers. That’s what we’ve stood for since 1979, and we’re staying true to that mission.”

– Tere Caruthers



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TAKING FLIGHT

UAS technology making big difference in ag production

Drone technology is taking flight in North Dakota, with farmers implementing new methods pioneered by groundbreaking researchers.

Throughout the state, unmanned aircraft systems (UAS) are already being utilized to some degree on farms and ranches. Much of it is trial and error, however, or still in the testing phase. But the potential

for UAS in agriculture – and other applications – is far greater than current usage.

As research continues to develop, and safety and privacy regulations become more clearly defined, agricultural expectations for UAS technology are impressive indeed.

“There are a number of industry forecasts predicting that agriculture will be the leading

industry sector to use unmanned aircraft here in the United States,” says Aaron Reinholz, director of research operations in North Dakota State University’s Office of Research and Creative Activity. “There are tremendous opportunities for this technology to be used to further precision agriculture. That’s really what we’re doing a fair amount of research on here – to validate expectation.”



RESEARCH IS KEY

Part of Reinholz's work is in UAS research through a relationship with the Northern Plains UAS Test Site in Grand Forks. North Dakota's test site is one of six that collaborate with the Federal Aviation Administration and other industry partners to develop equipment, systems, rules and procedures to expand the uses of

UAS in many different capacities, including agriculture.

"It allows us to utilize that test site and their capabilities to benefit our researchers here at North Dakota State University as well as our sister institution at the University of North Dakota," Reinholz says.

NDSU's UAS program was established in 2014, and in 2016 it took a huge step – or takeoff – with

the operation of a larger unmanned aerial vehicle (UAV) known as Hermes 450. The school has partnered with Elbit Systems of America, an Israel-based company, to fly the aircraft, which has a 35-foot wingspan and a flight time of around 18 hours. "The purpose of (the Hermes 450) project is to compare and contrast the results you can get from a larger aircraft at higher altitudes to a small UAV at

lower altitudes,” Reinholz says.

Larger UAVs have the ability to stay in the air longer and collect imagery at more than 50,000 acres per hour. This is a vast improvement on the one square mile per hour capabilities of smaller crafts.

Such information can be used to manage crops, fertilizer or even identify infestations more efficiently.

MANY POTENTIAL USES

Jim Reimers, who grows corn and soybeans on much of his family’s 30,000-acre Reimers Farms in Jamestown, sees the promise of UAS in agriculture. He has been experimenting with the technology since around 2013, working closely with John Nowatzki, extension agricultural machine systems specialist at NDSU, for data collecting, imaging of field and planting abnormalities, and other applications.

There are a number of industry forecasts predicting that agriculture will be the leading industry sector to use unmanned aircraft here in the United States.

AARON REINHOLZ

Director of Research Operations at the Office of Research and Creative Activity, North Dakota State University

“For us, it’s still new,” Reimers says of his experiments. “We’re trying to see how to make a fit for it, so we’ve used observations on different parts of the land, with different objectives in mind. If we find things that work, then we want to expand that to a lot more acres within the farm.”

Reimers, who owns and operates his farm with his brother, Dale, and nephew, says that drones can have several benefits for farmers. They

can be used to optimize nitrogen applications in corn, for instance, or discern conditions for planting varieties of soybeans.

“Another use is in crop insurance,” Reimers says. “Say there’s livestock damage from your neighbor’s cow. People can’t go out and walk the whole field. But you can fly over and quite easily see the damage and get a better idea of the area involved in the incident.”

– John McBryde

A drone takes flight at the NDSU Carrington Research Extension Center.



PHOTO COURTESY OF NORTH DAKOTA STATE UNIVERSITY

MILKING TECHNOLOGY

Robotic milking increases milk quality, benefits cows and producers

North Dakota dairies are milking new technology for all it's worth. Across the state, automated milking systems are increasingly popular. Innovative dairy farmers like Dwane and Joan Wanzek, owners of Wanzek Dairy in Cleveland, are using robotic milkers that make the process – and quality of life – better for both the producers and cows.

Each day, the dairy's 300 cows roam to one of the farm's five robotic milkers at their leisure, only approaching them when they need to be milked. Dwane Wanzek says the cows are milked when they want instead of at a set time daily like in a traditional milking schedule. This helps the animals feel more relaxed.

"They're doing a lot better, especially because they can come and go as they please to get milked," he adds.

Since installing the robotic milkers in early 2015, the farm's milk production has increased. The quality has improved, too, as the milk's somatic cell count has dropped by more than half. And cow pregnancy rate has gone up, while the need to replace cows has gone down. Additionally, the robotic milking system has freed up the family's schedule. No longer does someone have to be present to milk.

"There's no set schedule with the robots, which operate 24 hours per day," Wanzek says.

He was inspired to use robotic milking because of the Hoff Dairy in Richardton, the first in the state to install an automated milking system. Third-generation farmers, Harvey and Janal Hoff set up their own system in 2011. Like Wanzek, Harvey Hoff says the major benefits

of robotic milkers include a flexible schedule and increased cow comfort. Using his smartphone, Hoff monitors robotic milkers remotely. An app notifies him when cows are milked or of any technical

issues. The system also greatly benefits dairy consumers, he says.

"This helps put out a very safe product for the consumer, and that means a lot to us."

– Brittany Stovall



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Domestic policy in order to address farm bill, crop insurance and regulatory issues



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Photos by Steve Voit

Field to Feed and Fuel

North Dakota crop, livestock agriculture support each other

Agriculture is full of cycles. From seed to harvest, wet to dry season, and even from boom to bust, farmers know well the give-and-take of agriculture. This pattern is especially found in crop and livestock products, which are dependent on one another for success. One such mutually beneficial relationship is that between corn, beef and ethanol.

GREAT BEGINNINGS COME FROM CORN

Jeff and Vicki Enger have been corn producers in Marion since 1977 when they took over the family farm. Together with Enger's brother, nephew, and son, the family partnership devotes 3,500 acres to corn annually and also finishes around 1,000 Holstein steers every year.

"We use corn from our own farm and dried distillers grains (DDGs) from the ethanol plant. About two years ago, an ethanol plant was built within 17 miles of our operations so the corn we do not feed (about 75 percent) is sold to the ethanol plant," Jeff Enger says. Roughly 40 to 60 percent of corn grown statewide goes to one of five ethanol plants, creating a huge market locally for corn.

During ethanol production, a nutrient-rich byproduct called distillers grains is made. The North Dakota Corn Council has been funding research on this valuable feed for the cattle industry.

"Ten years ago, our state was growing 600,000 acres of corn. This year we are projected at 3 million, so we have really grown our industry within the state," Enger says.

Enger Farms in Marion raises both corn and cattle, two commodities that mutually benefit each other.

#11

NORTH DAKOTA RANKS NO. 11 IN THE U.S. FOR BEEF CATTLE INVENTORY.

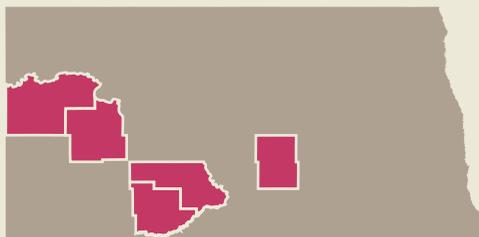


NORTH DAKOTA HAS ALMOST THREE COWS FOR EVERY PERSON IN THE STATE.

>\$640 million

is contributed annually to North Dakota's economy by the ethanol industry.

*MORE THAN **200 WORKERS** ARE EMPLOYED IN NORTH DAKOTA ETHANOL PLANTS AS CHEMISTS, ENGINEERS, ACCOUNTANTS, MANAGERS, SUPPORT STAFF AND MORE.*



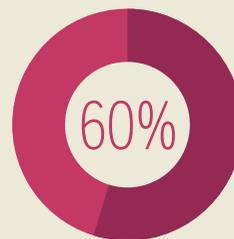
WHERE'S THE BEEF?

Beef cattle are raised in all of North Dakota's 53 counties. The top five producing counties are Morton, Grant, Dunn, McKenzie and Kidder.

EACH BUSHEL OF CORN PROCESSED BY NORTH DAKOTA ETHANOL PLANTS PRODUCES

- 2.8 gallons of ethanol
- 18 pounds of livestock feed
- 18 pounds of carbon dioxide

In addition to ethanol, corn is used to make sweetener and cattle feed.



Ethanol creates a huge local market for corn in North Dakota. Up to 60 percent of North Dakota corn goes to one of the state's five ethanol plants.

Sources: North Dakota Department of Agriculture, USDA National Agricultural Statistics Service, North Dakota Ethanol Council

North Dakota only consumes around 40 million gallons of ethanol, but we produce about 450 million gallons annually. The vast majority of ethanol produced in North Dakota is used as motor fuel. When blended with gasoline, ethanol reduces emissions.

JEFF ZUEGER

General Manager, Blue Flint Ethanol and Dakota Spirit AgEnergy

Looking toward the future of his three-generations-strong farm, Enger sees growth opportunities in feeding more livestock within the state.

“Recently, a beef processing plant was opened in Aberdeen, so maybe we will see more cattle finished in North Dakota because we have the corn available,” he says. “About 80 percent of our calves are shipped out, so this could be a game changer for both the corn and beef industries.”

THE BEEF FACTOR

Down on the Strommen Ranch in southern Morton County near Fort Rice, Aaron Strommen and his wife, Sheyna, and their three children, raise 180 registered Angus cattle. They also manage a herd of about 125 commercial cows, which are used as recipients in an embryo-transfer program.

“We differ from other beef producers in that 100 percent of our supplemental feed is purchased,” Aaron Strommen says. “We use corn as an energy source in our cattle’s diet. It’s purchased from local farmers and serves as an important part of our growing rations. We also use ethanol byproducts – modified distillers grains – as a protein supplement for our cow rations. It allows the cattle to better utilize poorer quality hay or straw, and ultimately helps us keep our supplemental feed costs low.”

Like the Strommens, many North Dakota cattlemen have embraced the idea of utilizing ethanol byproducts as a reliable source of feed.

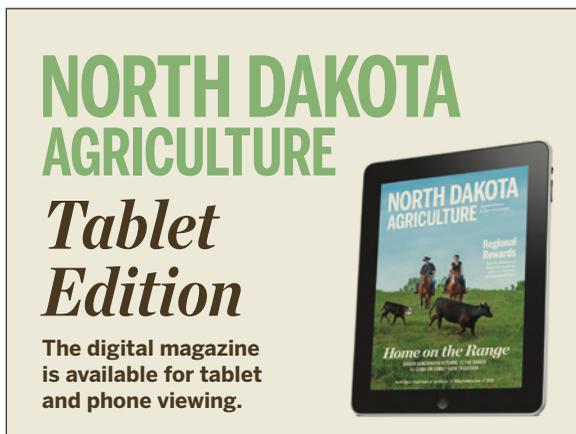
GIVING BACK THROUGH FUEL AND FEED

According to the North Dakota Ethanol Council, each bushel of corn processed by North Dakota ethanol plants produces 2.8 gallons of ethanol, 18 pounds of livestock feed and 18 pounds of carbon dioxide. The majority of ethanol is exported to national and international markets.

“North Dakota only consumes around 40 million gallons of ethanol, but we produce about 450 million gallons annually,” says Jeff Zueger, general manager, Blue Flint Ethanol and Dakota Spirit AgEnergy. “The vast majority of ethanol produced in North Dakota is used as a motor fuel. When blended with gasoline, ethanol reduces emissions. Additionally we produce corn oil at our facilities, which can be used as an input to biodiesel production or as a high energy feed product for livestock.”

Thanks to North Dakota’s abundant corn supply, ethanol facilities can process a locally grown product, further giving the state an advantage in production – and so the cycle continues, providing a win-win for all industries involved.

– Keri Ann Beazell



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ENHANCING



Meadowlark Granary produces some of the many value-added ag products made in North Dakota.

AG VALUE

Agriculture value-added products keep farms vital, boost the bottom line

North Dakota is home to a variety of unique companies producing locally sourced, healthy, value-added agricultural products offering endless benefits. For family farmers such as Stephanie Blumhagen, a fourth-generation farmer and owner of Meadowlark Granary in Bottineau, value-added products connect the generations. Blumhagen left the family farm for several years to pursue work in the nonprofit field, but when she returned, she wanted to find her “niche” and began studying the local food movement.

“I recognized how unique it is that our family has always milled our own flour from the wheat we grow instead of going to the store to buy flour,” she says. “I started selling bread at the Bottineau Farmers Market, and the business sort of took on a life of its own.”

Today, Blumhagen sells flour, whole-wheat sandwich bread, a variety of flavored and fruit breads, breakfast cookies, some

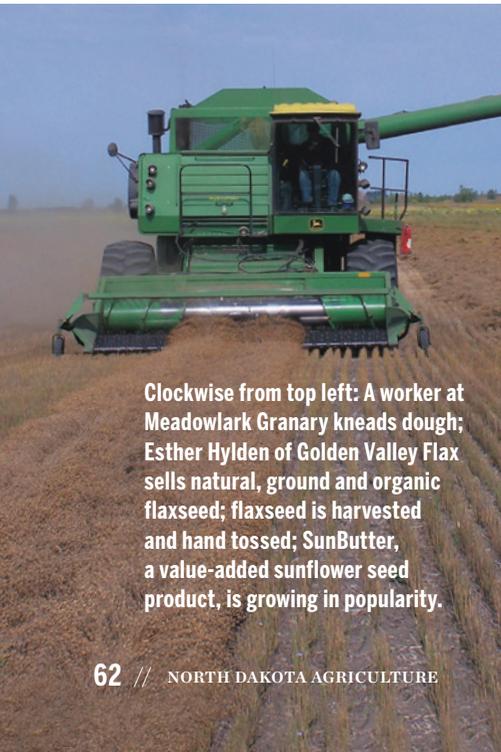
wheat-free pastries, and is currently developing a line of baking mixes. She says her flour is different from the all-purpose white flour that many people use because it is freshly milled, 100 percent whole-wheat flour, which means it hasn’t had the bran and germ removed. It contains more of the fiber, protein, vitamins and minerals. In addition to the health benefits, Blumhagen says her value-added business offers financial advantages for the community as well.

“I try to source as much as possible locally. I get fruit like apples and pumpkins from our own farm when I’m able and from other local farms when it’s available,” she says. “Then in my case, I’m the farmer, miller, baker and the vendor, so a much larger share of the food dollar stays with me and is then recirculated within the local economy.”

HEALTHY RETURNS

About 15 years ago, Esther Hylden, a registered nurse, began looking into integrating

PHOTO COURTESY OF MEADOWLARK GRANARY



Clockwise from top left: A worker at Meadowlark Granary kneads dough; Esther Hylden of Golden Valley Flax sells natural, ground and organic flaxseed; flaxseed is harvested and hand tossed; SunButter, a value-added sunflower seed product, is growing in popularity.



flaxseed into her husband Mark's diet as a way to combat his high cholesterol. Some of the research at the time indicated that flax might help naturally reduce the bad LDL cholesterol in the blood. The couple was pleasantly surprised to see Mark's cholesterol numbers drop from 250 to 160. Fortunately for the Hyldens, they had a steady supply of flax. Their family farm has produced flax for nearly 100 years and even won awards for the best flax in the state. The Hyldens decided to cash in on their discovery, adding even more value to their crop by starting Golden Valley Flax, a health supplement company, which sells natural, ground and organic flaxseed.

Value-added products like the Hyldens' help bring in more net profit for farms and keep farmers gainfully employed throughout the year. Mark Hylden says North Dakota is ripe for such value-added companies by the nature of its agricultural fertility.

"What we have found is that we are not better farmers than others but that the land and location of our farm is one of the best places in the world to grow high-quality flax. It is a combination of fertile soil and good rainfall along with an elevation of about 1,400 feet above sea level. It has long summer daylight hours but cooler average temperatures that create just the right environment that flax thrives in," Hylden says.

Premium Gold Flax also offers high-quality locally grown and processed flax products. The Miller family has been farming in central North Dakota for six generations and produces certified seed stock and Premium Gold® golden flaxseed products.

FARM-FRIENDLY

Value-added products, such as SunButter, a peanut- and soy-free spread made from sunflower seeds,

also provide an entirely new customer base for farmers.

"Especially in times like these where the commodity prices are really volatile, and they're not quite as high as a lot of farmers would like them to be, it gives them an outlet and a demand for the commodity that may not be there in different products," says Justin LaGosh, sales and marketing director for SunButter LLC. "We're taking sunflower seed and making a new use for it. Our demand and hunger for sunflower kernel from

our farmers grows every year."

Manufactured in Fargo, SunButter has increased in popularity as nut and soy allergies have increased. LaGosh says sunflower butter typically has more vitamin E and micronutrients, such as zinc, phosphorous and potassium not found in peanuts.

"It puts North Dakota on the map for a lot of people, and they're delighted to see that a U.S. product in the heartland of the country is produced and grown here here."

– Teree Caruthers

American Flax

Flaxseed is a super food rich in Omega 3s, dietary fiber, lignans, protein and the essential fatty acid ALA.

By using 1-3 tablespoons of ground flax each day, flax can be easily incorporated into meals and baked goods.

For More Information Contact:
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701-663-9799



HONEY BEES

BUZZWORTHY BUSINESS

North Dakota honey bee industry is vital to economy

What's the buzz on North Dakota honey? The state is the nation's top producer of tabletop honey, producing more than 36.3 million pounds of the sticky-sweet stuff in 2015, valued at over \$65 million. The number of beekeepers in the state has increased as well, from 182 in 2010 to 264 in 2015.

"We've doubled our colony counts due to the influence of canola. There's quite a bit in the north-central part of the state," says Will Nissen, beekeeper of Five Star Honey Farms and president of the North Dakota Beekeepers

Association. Nissen began beekeeping in 1978, and currently runs about 12,000 colonies in North Dakota and other states. He established Five Star in 1998 and currently operates with his wife, Peggy, and three sons, Matt, Levi and Evan. The average beekeeper in North Dakota manages between 1,000 and 1,500 colonies.

But while the honey flow is sweet, honey bees are also important to North Dakota's agricultural economy, as they pollinate close to \$15 billion in crops annually. In fact, North

Dakota bees often travel to California in the winter to help pollinate crops there as well.

"We pollinate in California from January through March, and then come back to North Dakota to rebuild strong hives," Nissen says. "Pollination is very hard on bees, and while we're building them back up, we also make honey."

If not for North Dakota honey bees, crops across the Western U.S. could not thrive, but the pollination also helps beekeepers make extra income in the winter.

North Dakota's climate and

Nearly 600,000

honey bee colonies are in North Dakota.

**NORTH DAKOTA
BEEKEEPERS
PRODUCED 36.3
MILLION POUNDS
OF HONEY IN 2015.**

Source: USDA National Agricultural Statistics Service



NORTH DAKOTA
IS **NO. 1** IN THE
NATION FOR HONEY
PRODUCTION.



geography, with vast open plains and National Grasslands support yellow clover, helping to produce delicious honey. To help keep bees safe and reduce opportunity of colony collapse, the North Dakota Department of Agriculture inspects hive locations for registered beekeepers in the state, looking for pests and diseases.

Honey not only tastes good, but it's good for you, too. Honey naturally contains a variety of antioxidants, thought to protect against cancers and other diseases, as well as small amounts of

vitamins and minerals. Consumers can eat local honey to help with seasonal allergies as well as for a boost of all-natural energy. Nissen says that a spoonful a day is thought to help with digestion, and eating honey before bedtime may help you sleep better.

– Rachel Bertone



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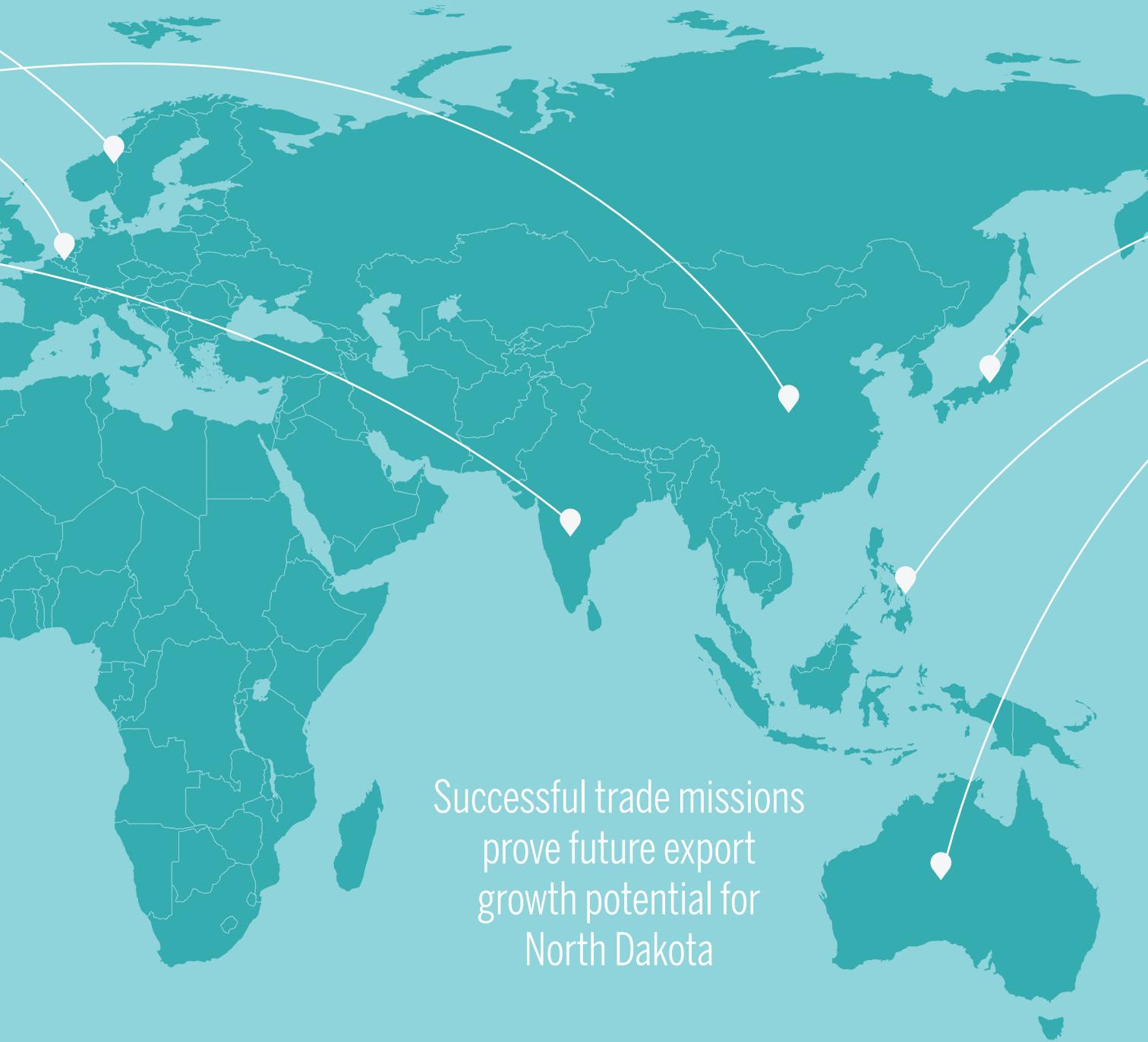
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Successful trade missions prove future export growth potential for North Dakota

With an innovative and resourceful spirit, North Dakota farmers are determined to feed the nation – and the world. Taking advantage of the state’s natural landscape and climate, producers have found success producing over 50 different agricultural commodities commercially, attracting interest from overseas markets.

According to the United States Department of Agriculture (USDA), North Dakota’s ag exports (tracked sales, not bulk sales) totaled \$4.5 billion in 2014 with dry beans, peas, lentils, chickpeas, food-grade soybeans and flax making the largest sales.

The state also ranks second nationwide in whole soybean exports.

Overall, the state ranks eighth in ag exports nationally but “No. 1 in U.S. production of wheat, dry edible beans, durum, barley, dry edible peas, canola, flaxseed and honey,” North Dakota Agriculture Commissioner Doug Goehring says.

Topping these accolades, however, is the fact that North Dakota has significantly expanded its export footprint over the years and shows no signs of slowing down.

“About 10 years ago, we were exporting to 63 countries. As of 2015, we’re exporting to 83 countries.

Every market we pick up makes a difference, providing economic and food security. We don't walk in to make a sale and leave. It's a two-way street and there are ways we all benefit. We want to build and keep relationships."

AG EXPORTS: DESTINATIONS AND END-USE

North Dakota's reputation for high-quality food products is no secret.

"If someone in the world is looking at buying pulse crops from the U.S., there's a high probability it's coming from North Dakota," confirms Dean Gorder, executive director, North Dakota Trade Office (NDTO). The same goes for niche commodities like canola and sunflower. "Or if you're eating bean sprouts in Korea, chances are they originated in North Dakota."

Korea is also a huge market for buckwheat where the hulls are used to make pillows. Meanwhile, local soybean exports are supporting the production of natto, a fermented soy dish from Japan, as well as soymilk and tofu across Asian markets. Ag machinery is headed to China, and cutting-edge technology like unmanned aerial vehicles and systems for precision agriculture is piquing interest in Norway, Sweden and Finland.

As the International Year of Pulses continues, Gorder has noticed rising demand for pinto, navy, black turtle, and cranberry beans in Mexico, the Caribbean, and Central and South America. Additionally, while countries like Egypt, Angola and Colombia have been traditionally high in pulse sales, the Philippines has recently reached out to NDTO to meet growing consumer demand.

NORTH DAKOTA'S FIRST INDIA TRADE MISSION

Led by Goehring in February 2016, the state's first trade mission to India was deemed a success by producers in attendance like SB&B Foods, a family-

owned agribusiness exporting food grade crops for 27 years. Presently, SB&B's largest volume of exports is food-grade soybeans shipping to 15 different countries.

The turnout of interested Indian manufacturers not only doubled expectations, but, "SB&B, along with other North Dakota soybean suppliers, will be shipping five containers of soybeans into India that can be distributed throughout the country as samples. This is the very first export of U.S. soybeans to India. It's historic," says Bob Sinner, president, owner and partner of SB&B Foods.

As of 2014, India was North Dakota's eighth largest export market with exports valued at \$35 million in 2014 – a 20 percent increase over 2013. With 1.3 billion people and the largest GDP growth in Asia, future trade agreements hold immeasurable potential for the agriculture industry.

FUTURE TRADE OUTLOOK

After a trade mission to Cuba in late 2015, North Dakota is prepared to meet many of the country's import needs, including wheat and dry beans.

"If they are going to do business in the U.S., they're coming to North Dakota because we are the biggest producer of these products," says Goehring. "The goal is not to replace food in their food system, but to enhance their food system with North Dakota products and technology."

In the coming years, thanks to the state's pro-trade, export-focused infrastructure, the agro-industry can count on exponential trade growth.

For Goehring, the plan is simple: "Ninety-six percent of the world's population and 80 percent of buying power in the world exists outside U.S. borders."

And where you find agricultural trade growth, that's where you'll find North Dakota.

– Keri Ann Beazell



IN 2014, NORTH DAKOTA'S AG EXPORTS EXCEEDED \$4 BILLION, WITH WHEAT, SOYBEANS, OILSEEDS, FEEDS AND CORN LEADING THE WAY.



North Dakota ranks No. 8 for ag exports nationally.

31,000

North Dakota jobs supported by ag exports

CERTIFIED TO SHIP

NDDA Plant Industry Divisions inspects, issues certificates for crop exports

Before North Dakota agricultural commodities are shipped to markets around the world, state inspectors work hard to ensure unwanted, damaging pests aren't hopping aboard for a ride overseas.

To make sure North Dakota ag products are ready and meet export requirements of receiving countries, the Plant Industries Division of the North Dakota Department of Agriculture (NDDA) works to inspect and certify the shipments. Importing countries often require crop and plant products to have a phytosanitary certificate, which verifies plant products have been inspected and are free from pests and pathogens.

That's where the NDDA Plant Industries Division (PID) steps in. The division implements North Dakota's export certification program and issues the certificates.

"We issue phytosanitary certificates as required by the importing country, showing the commodity is apparently free from injurious plant pests," says Charles Elhard, Plant Protection Specialist with the Plant Industries Division. "This could be soil, weed seeds, insects and pathogens, among others. Import requirements can vary greatly from country to country."

NDDA issues over 3,000 certificates for nearly 90 countries, Elhard says. Almost one-third of phyto certificates are for Mexico.

"North Dakota's most commonly exported commodities include soybeans, dry edible beans, peas, lentils, sunflowers, wheat, barley, flax and many others," he says.

NDDA PID inspectors also check

if plant and plant products meet national and international export requirements. The division works closely with other agencies to carry out inspections.

"Our division inspects smaller

shipments, such as samples that are sent to a potential customer before a large sale is made, or research seed shipments that typically come in small envelopes or bags," he says.

– Brittany Stovall

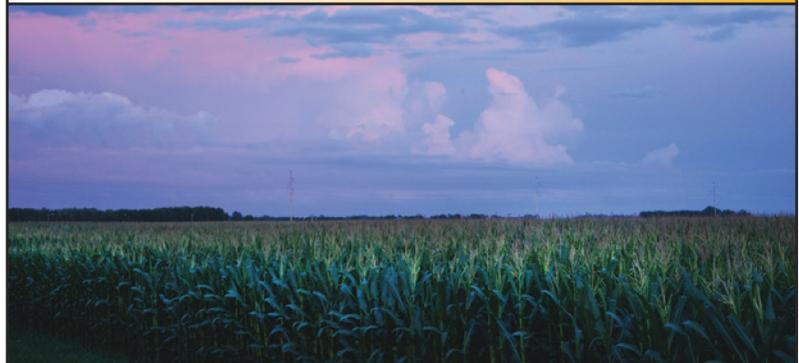


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SOY AND SWINE: Working Together

North Dakota soybean, swine production
work together to ensure success

Did you know at any given time there are nearly 140,000 pigs being raised in North Dakota? With each pig producing approximately 371 servings of pork, that's a lot of meat. To raise those animals, North Dakota farmers rely on the availability of high-quality feed primarily made of soybean meal and corn. Thankfully, North Dakota farmers do a fantastic job of raising those crops, too. In fact, North Dakota ranks No. 8 in the U.S. in soybean production, with Cass County No. 1 in the nation for soybean harvested acres in 2015.

"Pork and soybeans have a synergistic relationship, because soybeans are a critical part of every hog diet," says Tamra Heins, director of the North Dakota Pork Council. "It's hard to replicate what soy can do. When you extrude the oil from soybeans, the meal is what's left, and that's what is fed to swine along with corn. The corn is like the carbs, and the soy is like steak – it has high-quality protein."

The relationship between pork and soybeans is one way agricultural commodities in North Dakota support one another. According to the North Dakota Soybean Council, livestock and poultry farmers are the largest customer for U.S. soybean meal, consuming 97 percent of soybean meal. That translates to the meal from more than a whopping 32 million acres of soybeans each year.

GERMAN FARMS

Scott German of Oakes is a third-generation farmer who produces soybeans and corn, and finishes 14,000 pigs each year with his dad, Mick.

"My grandpa bought this farm in 1952 after he got out of the service," German says. "I think farming is something that's in your blood. My dad will soon be retirement age, and I see a lot of pride in his eyes



Hog and soybean (previous page) production have a mutually beneficial relationship.

when he shows my son how to run a piece of farm equipment."

German and his wife, Denise, a pharmacist, have four boys, ages 8, 11, 13 and 15. They raise, or "finish," pigs on contract, which means they get the pigs when they weigh about 40 pounds and grow them up to market weight, or between 265 and 280 pounds. The process takes about 120 days.

"Swine consume a lot of soybean meal, and the amount changes as they grow," German says. "A starter pig gets feed with 35 to 40 percent soybean meal. As they get older, they don't need as high protein, so it decreases to 15 to 20 percent."

German wants consumers to know that swine producers care about their animals and quality of life.

"People hear a lot of negatives about animal welfare. They see someone mistreating an animal on the news, but that is the exception, not the norm in our industry," he says. "For swine producers, animals are our livelihood and our income source. Ours is an antibiotic-free operation, meaning we treat sick pigs individually and care for them separately. If people took the time to visit with producers, they would find out how much we care for our animals."

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North Dakota Beef Commission

ndbeef.org

North Dakota Corn Council

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ndmill.com

North Dakota Pork Council

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Peterson Farms Seed

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GIBBENS FARMS

In Cando, cousins Jim and Bruce Gibbens raise soybeans, corn, wheat and barley at their 12,000-acre Gibbens Farms. They are also partners in Sky-Can Ltd., a 6,000-head farrow-to-finish hog operation that provides 45 full-time jobs. In 2015, they set a record with 160,000 baby pigs born.

“Bruce and I are fourth-generation farmers, and this year will mark the 134th crop at Gibbens Farms,” Jim Gibbens says. “Eight years ago, we partnered with Sky-Can, a Canadian company, to build our hog operation. We thought we should be more vertically integrated, and we wanted an outlet for all the corn we grow. We sell our corn exclusively to Sky-Can, and they process their own feed for the pigs,

so it’s a win-win.”

Gibbens and his wife, Linda, have five grown daughters and one son, and together the family owns 10 businesses in Cando, including a partnership in a pasta company called Bektrom Foods/Cando Pasta LLC. Their businesses employ a total of about 120 people in their small community of 1,200.

“We love our community. You have to have a positive attitude to succeed, and there are a lot of positive attitudes around here, because we’re not willing to quit or give up,” Gibbens says. “When we have company picnics or Christmas parties, we have 200 people show up, and half of them are employees. I’m proud that people depend on us and that we can contribute back to our community.”

– Jessica Mozo



PORK, THE “OTHER
WHITE MEAT,” HELPS
KEEP THE BODY HEALTHY
BY PROVIDING THIAMIN,
NIACIN AND MINERALS.

Source: North Dakota Farm Bureau

138K

Hogs inventory in
North Dakota

Source: North Dakota
Department of Agriculture

SOYBEAN HARVEST SOARS IN NORTH DAKOTA



Source: USDA National Agricultural Statistics Service

Growing a Global Demand



The North Dakota Soybean Council delivers value to farmers by investing soy checkoff dollars in programs that enable soybean producers to be knowledgeable, profitable and competitive in a global marketplace. Key focus areas include:

- Research
- Domestic and International Marketing
- Producer Education
- Consumer Awareness



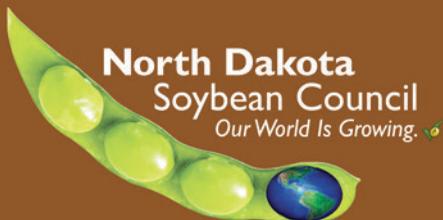
Over 90% of North Dakota Soybeans leave the state.



Over 70% of North Dakota soybeans are exported globally via the Pacific Northwest. North Dakota is the number three exporter of whole United States soybeans.



Primary importers of North Dakota soybeans are: China, Indonesia, Bangladesh and Vietnam



North Dakota
Soybean Council
Our World Is Growing.

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