VOLUME 5 • ISSUE 6
DECEMBER 2016

INSIDE

The Human Factor in International Market Development

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While other seed treatments claim to be effective against soybean cyst nematodes (SCN), Clariva® Complete Beans seed treatment, a combination of separate products, is the only broad-spectrum seed treatment proven to kill them all season long. As it acts to destroy SCN, it also reduces damage from sudden death syndrome (SDS). All this lethal power comes from a tough nematicide paired with the unbeaten insect and disease protection of CruiserMaxx® Beans with Vibrance® seed treatment, a combination of separately registered products. So contact your Syngenta representative or visit ClarivaCompleteBeans.com. And take back your fields.

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On the cover

About the cover: Sometimes there is nothing like seeing things for yourself. Trade teams from around the world, including a delegation from China, visited North Dakota in an effort to learn more about the state's production and the farmers who grow their soybeans.

—Photo by Wanbaugh Studios

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BRIDGING THE GAP

In light of North Dakota's bountiful 2016 harvest, farmers have the enviable task of marketing a huge crop.

While that problem is a good one, the crop's enormity magnifies the rural infrastructure's importance for moving grain to market.

Farm-to-market and market-to-market rural roads and bridges are critical components of the global supply chain that connects North Dakota's agriculture to its current and future customers everywhere. North Dakotans are, in turn, connected to suppliers at home and across the globe for their needs and wants.

Most of North Dakota's rural roads and bridges are "grandpa's" era infrastructure. They have been maintained with skill and care for decades, but were not designed for today's agriculture tools. More than half of North Dakota's agricultural commodities are delivered to their first point of sale in five-axle, semi tractor-trailer trucks, not the small trucks or tractors for which most roads and bridges were designed.

North Dakota's Upper Great Plains Transportation Institute completed its third rural road and bridge study in as many biennia. The studies focused on three primary segments of county and township infrastructure: paved roads, unpaved roads and bridges. The previous two studies indicated that rural infrastructure depreciates at a rate of about $1 billion per year. The newest study illustrated a marked improvement in the paved-road category.

Paved roads are viewed as good, fair or poor. The study indicates that the percentage of paved roads in the good category is up while the roads rated poor are down, decreasing their depreciation rate.

Unpaved roads are characterized by traffic volumes and show a slight increase for their depreciation-rate trend. Much of the increase can be attributed to improvements that were made by counties and townships with their reporting processes.

Bridges, meanwhile, are rated on each of their three components: bridge decks, superstructures and substructures. They are evaluated on a scale of 9 (excellent) to 0 (failed). Bridges are inspected and rated every two years. The evaluations consider the structural-deficiency and functional-obsolescence criteria of the state's 2,420 rural bridges that are over 20 feet in length. The study identified 703 structures that need rehabilitation or replacement from 2016-2036.

Depending on specific bridge needs, rehabilitation can take many forms. Replacement options generally include a new 32-foot wide bridge with a single- or multiple-barrel reinforced, concrete-box culvert plan. Environmental study processes can add time for planning and the construction of replacement-bridge activities. Repairing or replacing the 703 bridges pinpointed in the 2016 study will require an estimated $449 million (in 2016 dollars), which is essentially the same funding level that was identified in prior studies.

We have strong evidence that accurate identification of the needs and additional one-time legislative funding support has improved the paved roads in rural North Dakota. Accurate reporting details from county and township personnel about the roads under their care are critical both in the short and long term. We thank them and everyone who is involved with these processes.

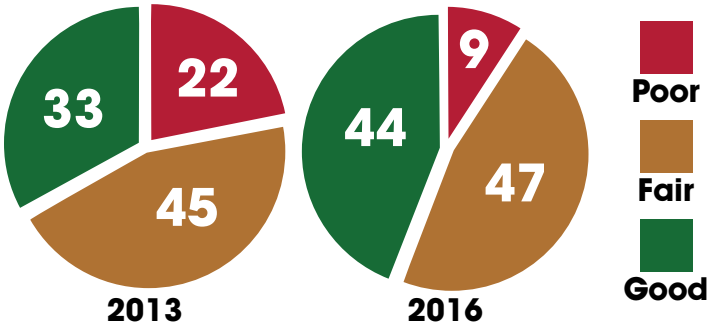
The state has slowed and reversed a long rural-road decline, as evidenced by accumulating depreciation levels for our paved road inventory. The decline for the unpaved inventory, and perhaps the bridges, too, has been slowed. We need to set achievable goals to assure that we do not let our infrastructure decline.

The draft study, Infrastructure Needs: North Dakota's County, Township and Tribal Roads and Bridges: 2017-2036 (Aug 16), can be found at http://www.ugpti.org/downloads/road_needs/.

Best Wishes for a Safe and Profitable New Year,

Scott Rising

North Dakota Paved Roads (%)



—Photo by Daniel Lemke

Craig Olson, President
North Dakota Soybean Growers Association

Trade agreements are the lynchpin for successful exports of North Dakota soybeans.

North Dakota has once again proven itself to be a reliable source of soybeans for the world market. In recent years, soybean acreage has expanded across the state and soybeans have become a staple crop for many producers. With the majority of farmers experiencing strong yields, we have an ample soybean crop to market to our customers again this year. With over 70 percent of North Dakota soybeans exported, primarily through the Pacific Northwest, we must acknowledge the importance of exports to our profitability.

Trade is always important for our soybeans, especially as North Dakota farmers continue to grow abundant crops year after year. We need reliable markets at home and abroad to drive demand.

One important factor for successful exports is trade agreements. These agreements are complicated and can sometimes incite opposition from other industries, but it is important to remember the positive impacts they can have in leveling the playing field for our soybean exports. One such trade agreement is the Trans-Pacific Partnership (TPP). According to information provided by the American Soybean Association, there are three different ways that the TPP would benefit farmers. First, the TPP would increase the export of soybeans, soy meal and soy oil. It would increase the sale of livestock and meats which use soy meal to feed. Finally, TPP will increase development of foreign buying power.

How do trade agreements help us as farmers? For example, there are countries that put tariffs on imported soy products and livestock. Japan currently has a 20 percent tariff on United States soy oil and a 4.2 percent tariff on U.S. soybean meal. Vietnam currently has a 33 percent tariff on soy products. There are many more examples, but the main point is that tariffs are cutting in to the value of our North Dakota-grown soybeans.

Foreign customers want high quality soybeans from North Dakota. However, when we are assessed high tariffs, our products become more expensive to our customers, impacting demand. Although our soybeans are high quality we have to sell them at a deduction with the tariffs in place against our soybeans. If those tariffs can be reduced or eliminated, we will have a more competitive environment for our beans and livestock.

North Dakota Soybean Growers Association

Membership Application

To join ASA and the North Dakota Soybean Growers Association, complete and return this application with payment.

Name: _____

Spouse: _____

Date of Birth: _____

Farm/Company Name: _____

Address: _____

City, State, Zip: _____

County: _____

Phone: _____

Cell: _____

Email Address: _____

Occupation (Please check all that apply)
❑ Farmer ❑ Retired ❑ Agribusiness
❑ Finance ❑ Elevator ❑ Other

Do you currently grow soybeans?
❑ Yes _____ ❑ No _____
Soybean Acres: _____ Total Acres Farmed: _____

Do you raise:
❑ Cattle ❑ Hogs ❑ Poultry ❑ Dairy

How did you hear about NDSGA? (Please circle one)
Recruited in person; Recruited by phone, Magazine;
Internet; Mailing; Radio; Event; Other

❑ 3-Year Membership $200 ❑ 1-Year Membership $75
❑ Check enclosed (please make checks payable to NDSGA)
❑ Credit Card: Visa / MasterCard / Discover / American Express
Card Number: _____
Expiration Date: _____/ _____ CVC: _____
Name on Card (Please print): _____
Signature: _____

Mail application with payment to:
North Dakota Soybean Growers Association
1555 43rd Street S., Suite 103
Fargo, ND 58103

An ARMY of ONE

Mike Beltz isn't one to stand on the sidelines. He's a fourth-generation farmer and self-described "army of one" who raises corn and soybeans on land near Hillsboro, North Dakota.

As a veteran of numerous growing seasons, Beltz has been through the battles that come with production agriculture.

"I've had the typical ups and downs," Beltz says. "Sometimes, it's been good, sometimes not so good, but you adjust, survive and continue on."

Beltz grew up on the farm and never seriously thought about doing anything else. North Dakota's agriculture industry is likely better for it.

Fully Involved

For years, Beltz has taken an active role with many of the state's most influential ag organizations. He's served on the Northern Crops Institute's board, the U.S. Dry Bean Council's Ag Issues Committee, the North Dakota Ag Coalition, the North Dakota Soybean Council, the North Dakota Ag Rail Business Council and his township board. He is currently on the North Dakota Soybean Growers Association's Legislative Committee. Beltz also chairs one of North Dakota's most important agricultural groups.

While serving in one of his previous roles, Beltz became intrigued by the State Board of Agricultural Research and Education (SBARE). The 16-member SBARE board supports agriculture research projects, disseminates research information through the North Dakota State University Extension Service, and recommends funding for Extension and the Agricultural Experiment Station.

Beltz became involved with SBARE six years ago and has chaired the group for the past three years.

"I think it's valuable to have producers on the board so you have a say, some self-determination," Beltz says. "It provides a connection between producers and the research that's being done in the state."

As a practicing farmer, Beltz recognizes the role that research plays in modern agriculture, both in terms of increased production and addressing challenges.

"Research is our future. It's how we got to today and how we'll get to tomorrow," Beltz says.

Beltz says that herbicide resistance and weed control are becoming more of a focus. He also sees research and education helping to impact farmers through new opportunities.

"I think we have great potential for adding value to commodities. We can add value here, so we capture more locally," Beltz says.

Beltz believes that animal agriculture provides an opportunity for North Dakota farmers.

"We do have some beef production in the state but not much else. They produce a lot of livestock across the river in Minnesota. We could do it here as well," he says.

Broad Support

The SBARE board includes two state lawmakers as well as the NDSU president, the state agriculture commissioner, the heads of Extension and the Ag Experiment Station, and other key agriculture leaders from across the state. The board solicits input from stakeholders to help determine research priorities and recommendations.

Most years, there are more needs than available funds. Beltz says that he is grateful that the legislature has supported investments in the ag community, even when state budgets have been tight.

"I believe those investments have had a strong return to the state," Beltz adds.

Record corn and soybean yields in 2016 are evidence that North Dakota is among the nation's

leaders in agricultural production. Supporting research and education can help keep North Dakota farmers productive far into the future.

"There is a bright future as long as we mind the stewardship," Beltz says. "We've been given a tremendous asset in the land, so we need to make sure we pass it along better than we found it."

Beltz points to the motto on the state coat of arms as words for farmers to follow: "'Strength from the soil.' If we follow that, we'll have a strong future," he says.

Beltz has spent much of his life involved with farm organizations in an effort to make a positive difference. He says that all the effort has been worthwhile because he's been fortunate to work with many high-quality people. Beltz also enjoys the fact that he is doing work that matters and has broad benefits.

"It's well worth the time I've put into it. I feel like I've gotten back twice what I've put in," he says.

—Story and photos by Daniel Lemke

Hillsboro farmer Mike Beltz is fully involved in North Dakota's agriculture industry, including serving as chair of the State Board of Agricultural Research and Education.

Dear Valued Soybean Producers,

This year marks the 25th anniversary of the soybean checkoff and an opportunity to celebrate how you have become major players in the global soy industry over the last 2½ decades.

First, the soy checkoff has built demand for U.S. soy. Soybeans have evolved from a support crop to a major player in the global marketplace. We've done this with checkoff investments in building markets, researching and commercializing new uses, and meeting end users' needs. In 1991, the year the soy checkoff was created, the value of the U.S. soy crop was $11 billion. In 2014 the overall value was more than $40 billion.

Second, in the past 25 years of the soy checkoff, China has gone from a competitor to the U.S. to our largest soybean customer thanks to the checkoff's work there. In 2014, China imported $14 billion worth of U.S. soy. That alone is more than the 1991 U.S. soy crop value.

The checkoff was designed so that all soybean farmers contribute equally, one-half of one percent of each bushel. You have a strong advantage over other soybean producers in the world with the soy checkoff. The checkoff will continue to focus on building preference for U.S. soy with our end users through improved varieties that are sustainably produced.

Created and led by soybean farmers, the checkoff harnesses the power of all farmers and leverages that with the industry to create profit opportunities for you and all U.S. soybean farmers. It's a competitive advantage for you and our industry.

I wish you and yours a happy and blessed holiday season!

Diana Beitelspacher,
Chief Executive Officer
North Dakota
Soybean Council

Email:
dbeitelspacher@ndsoybean.org

Phone:
1-888-469-6409

It's Election Time at the North Dakota Soybean Council

Not ready for board service? Consider a county representative position.

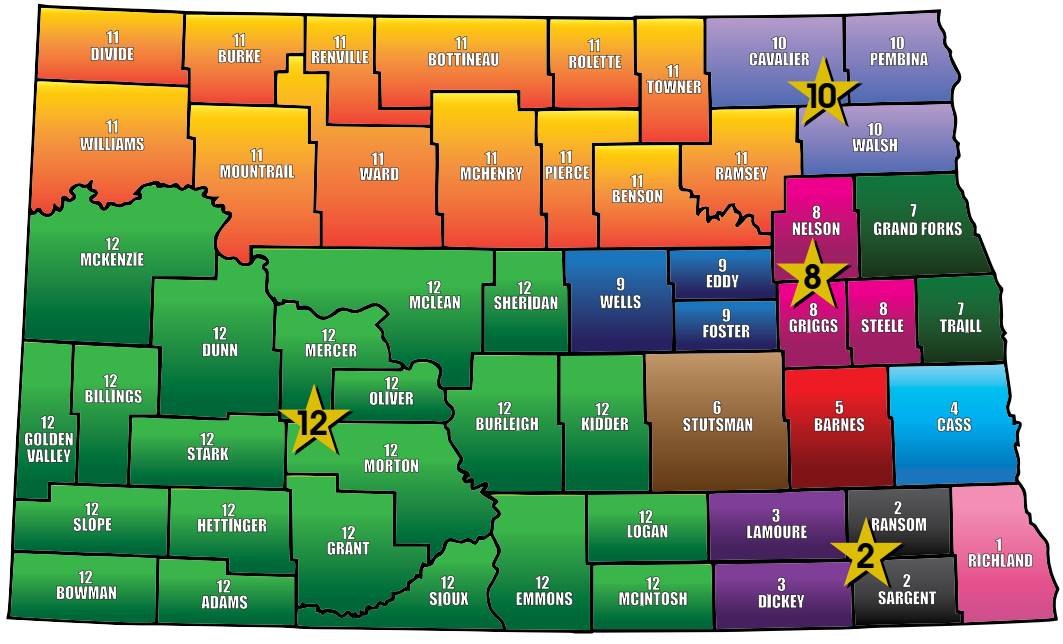
In 2017, the North Dakota Soybean Council (NDSC) will seek four soybean farmers from the following districts to serve on its Board of Directors:

- District 2: Ransom and Sargent Counties
- District 8: Nelson, Steele and Griggs Counties
- District 10: Walsh, Pembina and Cavalier Counties
- District 12: Southwestern North Dakota Counties (See map)

Nomination forms will be issued to soybean producers in the counties listed above in January. Election ballots will follow in February. You can nominate yourself or someone you know in your county who has a passion for the soybean industry and a willingness to serve.

Who is qualified to serve as a director on NDSC?

Any person who plants or causes to be planted a soybean crop where the person has an ownership interest with the intent that, upon maturity, the crop will be harvested. The person will meet this requirement



during the next available growing season or has met this requirement during the immediately preceding growing season. Organic producers who have been exempted from paying assessments are not eligible to serve on the NDSC board.

What is the time commitment required for board service?

NDSC board meets quarterly for two days in Fargo. Most board members are appointed to serve on state and national boards that work to support the soybean industry. Examples include the Soy Transportation Coalition, North Central Soybean Research Program, National Biodiesel Board, World Initiative for Soy in Human Health, U.S. Soybean Export Council and the Northern Crops Council to name a few. These external meeting commitments range from three to four meetings a year - averaging 1 – 3 days in length. Reimbursement is provided for travel to and from all these meetings, along with lodging and meals.

What are the expectations of service?

NDSC board is a working board, which means that directors are expected to attend all committee and board meetings, to come prepared to the meetings in order to make informed decisions, to attend various council-sponsored meetings and events, and to comply with NDSC policies as well as state and federal regulations. New directors participate a full-day orientation session to integrate them into the NDSC's work. Directors are supported by a six-member team of qualified, experienced and dedicated employees.

Rachael and Joe Ericson of Wimbledon.

Why serve? What's in it for me?

Service on NDSC board of directors:

- Enables you to influence how your checkoff dollars are invested.
- Places you a position to influence the industry's direction.
- Enables you to greatly expand your network of fellow producers, leaders and key influencers in the soybean industry on a state or national level.
- Increases your industry knowledge through your exposure to production research, domestic and international marketing, educational opportunities and other areas.

Not quite ready for board member service? Consider serving as a "County Representative".

Currently, of the four districts up for election in 2017, there are 16 counties that do not have anyone serving as "County Representative" liaisons between soybean farmers in those areas and NDSC. We'd like to have these vacancies filled.

What Counties are in Need of County Representatives in 2017?

Adams, Billings, Bowman, Burleigh, Dunn, Golden Valley, Hettinger, McKenzie, Mercer, Morton, Oliver, Sheridan, Sioux, Slope and Stark.

What are the responsibilities of a County Representative?

While there are no regularly scheduled meetings for county representatives to attend, there are many opportunities to serve that do not require a large investment of time or travel. Examples of ways to serve include:

- Participate in soybean producer outreach efforts – provide feedback on programs and initiatives NDSC is interested in pursuing.
- Provide input to establishing NDSC's research priorities for the year
- Attend at least one meeting a year with the NDSC board and staff to become more familiar with the work of NDSC
- Attend the annual Soybean Expo to be recognized
- Participate in NDSC and United Soybean Board director election process
- Attend NDSC sponsored events and producer education meetings as able
- Help promote, educate and communicate the work of NDSC to producers in their counties
- Communicate issues of concern regarding the soybean industry or NDSC to NDSC
- Inform NDSC of new soybean producers in their area who we may not have on our mailing list

How can I learn more about serving on NDSC board or as a County Representative?

Contact Diana Beitelspacher at NDSC office by telephone, toll-free, at 888-469-6409 or, in the Fargo area, at 701-239-7194. You can also send an email to dbeitelspacher@ndsoybean.org. Visit our website – www.ndsoybean.org for election updates.

—Story by staff, photo by Greg Wanbaugh

MARK YOUR CALENDAR

2017 Northern Soybean Expo

February 7, 2017 • Fargo Holiday Inn

7:30 a.m. – 8:45 a.m. **Registration and Buffet Breakfast with Soybean Researchers**

9:00 a.m. – 10:00 a.m. **Live Taping of U.S. Farm Report**

Panel of the nation's leading and in-demand market analysts that is moderated by John Phipps

10:00 a.m. – 10:45 a.m. **Break**

10:45 a.m. – 11:00 a.m. **Opening Remarks**—Facilitated by Emcee John Phipps

Tyler Speich, Chairman, North Dakota Soybean Council
Craig Olson, President, North Dakota Soybean Growers Association

11:45 a.m. – 12:30 p.m. **Lunch**

12:30 p.m. – 2:00 p.m. **Pamela Ronald**—Professor at UC Davis

Tomorrow's Table

Professor Pamela Ronald is a world-recognized plant geneticist studying genes that control resistance to disease and tolerance to environmental stress. Prof. Ronald and Raoul Adamchak, her husband, authored Tomorrow's Table – Organic Farming, Genetics, and the Future of Food. She brings a uniquely balanced, global perspective on the history of agricultural genetics, challenges facing agriculture today, and the promises, limitations, and sustainability of various technologies. Prof. Ronald will provide this overview in the context of genetically improved crops available to farmers in less developed countries.

2:00 p.m. – 2:30 p.m. **Break**

2:30 p.m. – 4:00 p.m. **Chip Flory**—Farm Journal Media

Record Crop/Record Demand. What's Next?

After harvesting impressive corn and soybean crops in 2016, the task of the grain markets is to move those bushels into the hands of end-users as quickly as possible. Total use of both corn and soybeans in the first half of the 2016-17 marketing year needs to be record large to stay on pace to hit USDA demand estimates. Final crop estimates and the usage pace will impact not only 2016-crop marketing opportunities, but will also impact growers' decisions on what they'll plant for 2017. And, of course, South American crop prospects will greatly affect pricing opportunities. Chip will provide an update on what's driving prices and the key factors that will drive prices ahead of the growing season and into the summer months. And, most importantly, Chip will discuss the risk-management strategies farmers should consider.

4:00 p.m. **Closing Remarks**—John Phipps

Emcee for the Day: John Phipps, U.S. Farm Report

Attendance is FREE. To register, visit:
2017soyexpo-cornvention.eventbrite.com

Jared Hagert Re-Appointed and Darren Kadlec Appointed to United Soybean Board

Jared Hagert, a soybean farmer from Emerado, North Dakota was re-appointed by U.S. Agriculture Secretary Tom Vilsack to serve another 3-year term on the United Soybean Board (USB). Hagert is currently the chairman of USB. Hagert has served on USB since 2010, and this will be his final 3-year term.

Pisek, North Dakota soybean farmer Darren Kadlec was also newly appointed by U.S. Agriculture Secretary Tom Vilsack to serve on USB for a 3-year term. Kadlec sat on the North Dakota Soybean Council from 2001 to 2008, including serving as chairman. Kadlec replaces Joel Thorsrud of Hillsboro who completes his maximum nine years of service on USB in December.

"We congratulate Jared on his re-appointment and Darren on his new appointment to USB," says Diana Beitelspacher, CEO of the North Dakota Soybean Council. "Jared and Darren bring many years of industry experience and leadership to the board and we know they will represent North Dakota and all U.S. soybean farmers exceptionally well. We respect and admire their dedication to enhancing and strengthening our industry on a state, national and international level."

Also representing North Dakota on the USB is Jay Myers, a soybean farmer from Colfax, North Dakota.

"Soybean farmers are at the heart and mission of the soy checkoff," says Jared Hagert. "To embody the farmer perspective, farmer-leaders from the soybean-growing region step up to volunteer their time and skills to maximize profit opportunities for their neighbors over the county line and across the country. It is through the expertise, vision and inspiration of these dedicated men and women that the checkoff can bring fresh, new ideas to grow innovation beyond the bushel."

The USB's 73 farmer-directors work on behalf of all U.S. soybean farmers to achieve the maximum value for the soy-checkoff investments. These volunteers invest and leverage checkoff funds in programs and partnerships to drive soybean innovation beyond the bushel and to increase the preference for U.S. soy. That preference is based on U.S. soybean meal and oil quality as well as the sustainability of U.S. soybean farmers. For more information about the United Soybean Board, visit www.unitedsoybean.org.

—Story by United Soybean Board and staff. Photos by United Soybean Board and Greg Wanbaugh

USB Chairman Jared Hagert of Emerado.

Darren Kadlec of Pisek.

NDSC Congratulates Scholarship Recipients

Annually, the North Dakota Soybean Council (NDSC) sponsors two scholarships for undergraduate students and two scholarships for graduate students at North Dakota State University (NDSU). NDSC's Undergraduate Scholarship is awarded to sophomores or juniors in crop and weed sciences, soil science, food science, animal science, agribusiness or agricultural economics who have a demonstrated a tie to soybeans; and are a U.S. citizen with a minimum 3.0 GPA. NDSC's Graduate Student Scholarships are awarded to graduate students involved in research that benefits the soybean industry.

This year, Jessi Lagein, Rocklake, North Dakota, pictured right; and John Baldwin, Fargo, North Dakota, not pictured, were awarded NDSC's Undergraduate Scholarships. Benjamin Cigelske, Hatton, not pictured; and Daniel Landman, Northwood, North Dakota, not pictured, were awarded NDSC's Graduate Student Scholarships. NDSC Communications Director Suzanne Wolf, pictured left, attended NDSU's Scholarship Recognition Luncheon on November 3.

—Story and photo by Staff

Jessie Lagein (right) of Rocklake, is one of four NDSC scholarship recipients.

Getting it Right

Soybean Production Meetings 2017

Soybean producers who are interested in intensive soybean management should plan to attend one of five Getting it Right in Soybean Production meetings and lunches sponsored by the North Dakota Soybean Council.

At the meetings, NDSU Extension Service faculty and staff will discuss past soybean research conducted in North Dakota as well as the outlook and production issues for 2017.

"Farming is very complex, and new production information is generated annually. With tight budgets, it is important for producers to gain as much knowledge as possible," says Hans Kandel, NDSU Extension Service agronomist. "These soybean educational meetings, featuring research-based information, can help producers with soybean-production decisions for the 2017 growing season."

Meeting Information

1. Burke County
Thursday, January 5
9:30 a.m. to 3:30 p.m.
Contact:
Dan Folske dan.folske@ndsu.edu
Location:
Lignite Community Center, Lignite, North Dakota

2. Towner, Cavalier, Ramsey, Benson, Pierce and Rolette Counties
Tuesday, January 24
10 a.m. to 3 p.m.
Contact:
Lindy Berg lindy.l.berg@ndsu.edu
Location:
Masonic Lodge meeting hall, Cando, North Dakota

3. Bottineau, Rolette, Pierce, McHenry, Renville and Ward Counties
Wednesday, January 25
10 a.m. to 3 p.m.
Contact:
Sara Clemens
sara.clemens@ndsu.edu
Location:
Cobblestone Inn, 1109 11th Street East Bottineau, ND 58318.

4. Mclean, Sheridan, Mercer, Oliver and Burleigh Counties
Thursday, January 26
10 a.m. to 3 p.m.
Contact:
Calla Jarboe
calandria.jarboe@ndsu.edu
Location:
Basement of the Memorial Hall in Washburn, North Dakota. From the North on Highway 83, turn right onto 1806/Alternate 200. Take the second left onto Main Ave. Continue on Main Ave. for ¾ of a mile. Memorial Hall is on your right. From the South on Highway 83, turn left on Main Ave. (First turn into Washburn/just after the speed-limit change). Continue on Main Ave. for just over ¾ of a mile, Memorial Hall is on your left. Park on the south side of the building.

5. Logan, Kidder, Burleigh, Emmons, McIntosh and Stutsman Counties
Friday, January 27
10 a.m. to 3 p.m.
Contact:
Sheldon Gerhardt
sheldon.gerhardt@ndsu.edu
Location:
Downtowner Banquet Room, 310 Main Ave. Napoleon, ND 58561.

Speaker Information

Participating extension agents (Dan Folske, Lindy Berg, Sara Clemens, Calla Jarboe and Sheldon Gerhardt) will be the hosts and will provide local production and crop updates.

Sam Markell, NDSU Extension pathologist, will provide an update (Lignite, Washburn and Napoleon) on the disease outlook for 2017 and field-research results from 2016. Two important topics will be an update on soybean cyst nematodes and how to manage soybean diseases.

Hans Kandel will provide information about variety selection as well as the latest information on various production issues, such as the importance of good root nodulation, fertility issues and water management.

Greg Endres, NDSU area Extension specialist/cropping systems, will discuss intensive soybean management, no till and strip till versus conventional till, planting dates, plant populations and row spacing, different soybean special inputs on the market and weed-management issues.

Janet Knodel, NDSU Extension entomologist, will discuss how to manage various insect pests, including spider mites and soybean aphids.

In Lignite, Chris Augustin will provide an update on soil issues related to soybean production.

—Story by Dr. Hans Kandel

Funded by the North Dakota soybean checkoff.

New Virulent Types of Soybean Cyst Nematode Appearing in North Dakota Soybean Fields

In 2016, two new virulent types of soybean cyst nematode (SCN) were found in Richland and Cass Counties. One of them, called HG 2.5.7, can cause some disease on lines containing PI88788, the most commonly used source of resistance to SCN. While only confirmed in one field, SCN that can reproduce on PI88788 is alarming.

Background

SCN (scientific name: Heterodera glycines) is the most damaging soybean disease in the United States. This nematode was first found in North Dakota in 2003 and quickly spread within the state; it is currently found in at least 19 counties. SCN is a soil-borne pathogen that is easily transported from field to field on any equipment carrying soil, so SCN poses the greatest threat to soybean production in North Dakota. The use of resistant varieties in combination with crop rotation is the principal means for managing SCN in our area. However, SCN is known to consist of genetically diverse nematode populations, and these can evolve over time to develop higher levels of virulence under high selection pressure. The high selection pressure is derived from the continuous use of resistant varieties. The new virulent types can then overcome and attack the resistance genes that are commonly used for the resistant varieties, and those varieties become less effective for SCN control.

Figure 1: HG-type testing with seven Plant Introduction soybean lines and a susceptible check in a growth chamber maintained at 27 °C for 30 days.

Shift in SCN virulence

In North Dakota, the virulent type (called HG type) that has been detected in the past 10 years is HG type 0 which is considered to be the least virulent type of SCN and does not attack PI88788 and Peking, the two major resistance sources used to develop resistant varieties for SCN control. In our HG-type tests supported by the North Dakota Soybean Council, two new virulent types (HG type 2.5.7 and HG type 7) were detected this year and were confirmed in two SCN-infested fields in North Dakota. One new virulent strain (HG type 2.5.7) reproduced well on PI88788, the most widely used source of resistance when developing resistant soybean varieties (more than 95 percent). Although many sampled fields still have populations of HG type 0, new HG types that attack PI88788 are appearing in some SCN-infested fields in our state. This is what happened in Iowa, Illinois, Minnesota, South Dakota and other states where there has been a long history of soybean production and where resistant varieties have been used for many years. In many soybean-producing states, the PI88788 source of resistance becomes ineffective or less effective because virulent populations have formed and attack that resistance source.

SCN HG type and its determination

HG refers to Heterodera glycines, and the type refers to seven different Plant Introduction (PI) soybean lines with various forms of resistance. For example, HG 1.2.3 refers to a strain of the nematode that is capable of reproducing on the #1 PI line (PI 548402), the #2 PI line (PI 88788) and the #3 PI line (PI90763). Therefore, that strain is not controlled by the resistance genes in those three PI lines. The SCN HG type is determined by a standard greenhouse bioassay. The assay is conducted with the seven different PI lines used as test lines and a standard soybean variety serving as the susceptible check. These soybean lines, inoculated with a SCN population from a field, are grown in cone-tainers that are maintained at 27 °C in a growth chamber (Figure 1). After 30 days of growth, the plants are removed from the cone-tainers, and white-yellow SCN females are washed off the roots and counted (Figure 2). Any PI that produces more than 10 percent of the number of females on the susceptible check is considered susceptible (sensitive) and, therefore, is not effective to control this SCN population.

Implication of the SCN HG type change

Our research demonstrated that a new virulent strain (HG type 2.5.7) appeared in a North Dakota soybean field and reproduced well on the most widely used source of resistance, PI88788. Evidence of the virulence shift may help growers to be alert and to become aware of what SCN population builds up in their infested fields where resistant varieties have been grown. In Richland and Cass Counties, there are fields where resistant varieties from PI88788 may have been used in the past 10 years. The selection pressure imposed by long use of one resistance source may, eventually, result in a shift for the virulent types. While this type of resistance can still be used for SCN management, rotation between different sources of host resistance may be needed to manage SCN in some fields where the PI88788 source of resistance is failing. More fields will be surveyed to monitor the scope of SCN virulence changes in the state. Knowledge about virulence types may affect growers' decisions when selecting SCN-resistant soybean varieties to combat this disease.

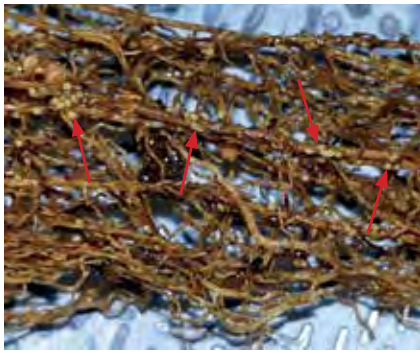


Figure 2: White-yellow SCN females (red arrows) reproducing on susceptible soybean roots that were grown in a growth chamber.

—Story and photos by Dr. Guiping Yan, Dr. Berlin Nelson and Dr. Sam Markell, NDSU

Funded by the North Dakota soybean checkoff.

Iron Fertilizer Quality Matters

Farmers usually don't have to be concerned about the quality of the fertilizers that they buy.

Urea granules are pretty much urea granules, whoever makes them. Monoammonium phosphate granules are pretty much monoammonium phosphate granules no matter who makes them. Farmers usually don't have to be concerned about whether one nutrient source is better than another. A pound of nitrogen from urea is about as effective as a pound of nitrogen from 28-0-0. A pound of phosphate from 11-52-0 is about as effective as a pound of phosphate from 10-34-0.

However, these rules don't apply to iron fertilizers. Iron sources, when applied to the soil, vary widely in effectiveness. Some iron sources, such as ferrous sulfate, Fe-lignosulfonate or Fe-EDTA, are essentially useless when applied to our soils. These sources quickly precipitate out to form iron oxide (rust). The one iron fertilizer with a proven track record of effectiveness for soil application is a chelate called FeEDDHA. Unlike most other chelates, the EDDHA molecule holds onto its iron in the soil environment, keeping it available to plants.

Unfortunately, the commercial manufacture of FeEDDHA is a complicated process, and the final product is far from pure. In the simplest terms, a commercial FeEDDHA product contains three things: a mixture of the effective form (called "ortho-ortho"), a completely ineffective form (called "ortho-para") and condensates that are mostly ineffective. Commercial products in the U.S. typically range from having about 40 percent of their iron in the desirable "ortho-ortho" form to upwards of 80 percent. The higher the actual "ortho-ortho" percentage, the better.

The purpose of this experiment was to compare four iron fertilizers. FeEDDHA-1 was a high-quality product, with about 80 percent of its iron in the desirable "ortho-ortho" form. FeEDDHA-2 was a lower-quality product, with a little less than 50 percent of its iron in the desirable "ortho-ortho" form. We also included two iron fertilizers that may be sold in North Dakota in the future, FeEDDHSA, and FeHBED.

A greenhouse experiment was performed. Soybeans were grown to the 4th trifoliate stage (about 4-5 weeks in the greenhouse) with 0, 0.5, 1.0 and 1.5 milligrams of Fe per pot. After the first crop, the soil was mixed, and a second crop was grown.

Figure 1 shows the results from the first greenhouse crop: the effect of the iron sources on the chlo-

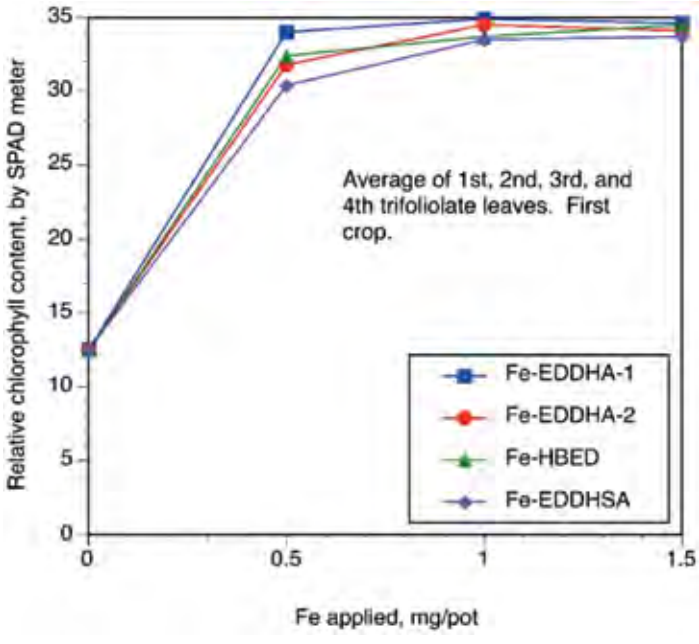


Figure 1. Effect of four iron fertilizers on chlorophyll levels in soybeans affected by iron deficiency chlorosis. First crop.

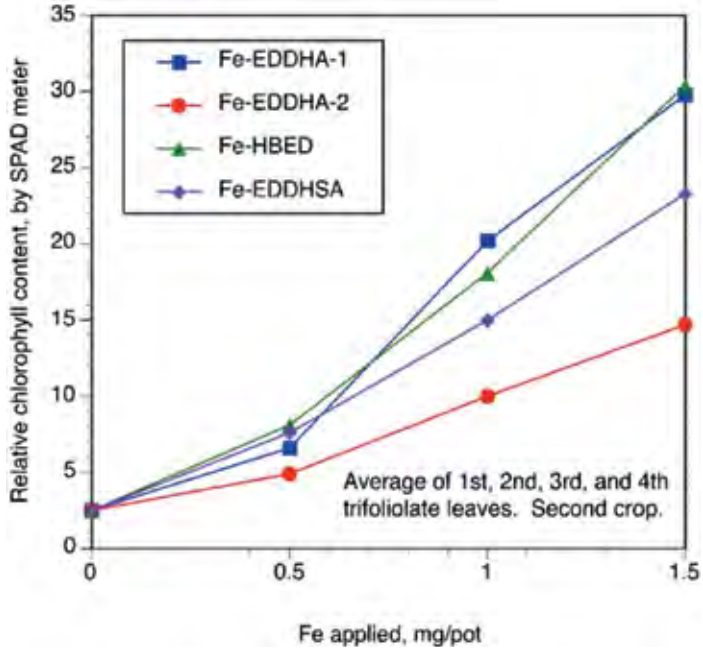


Figure 2. Effect of four iron fertilizers on chlorophyll levels in soybeans affected by iron deficiency chlorosis. Second crop.

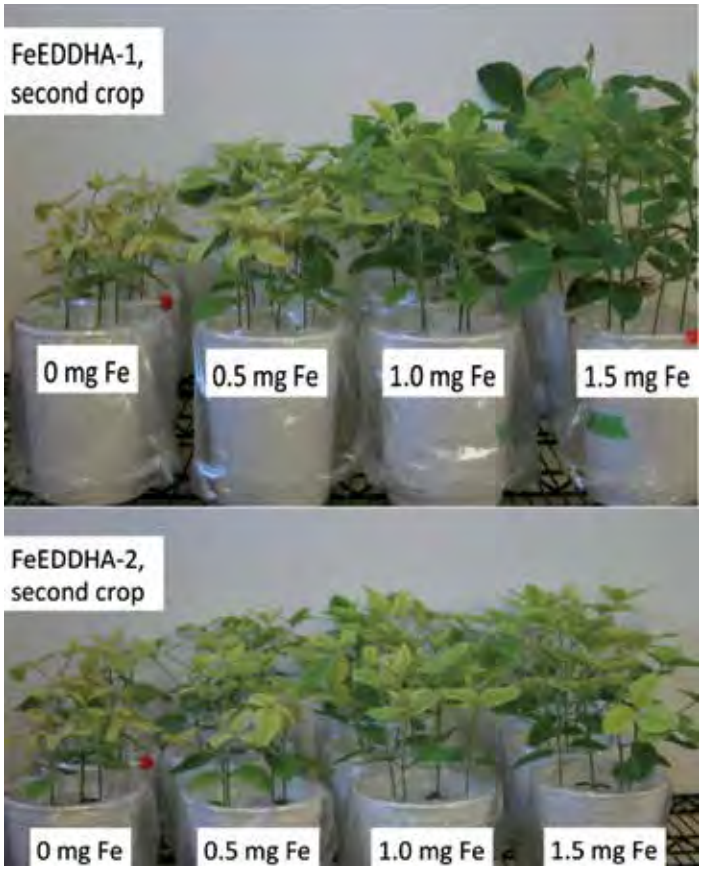
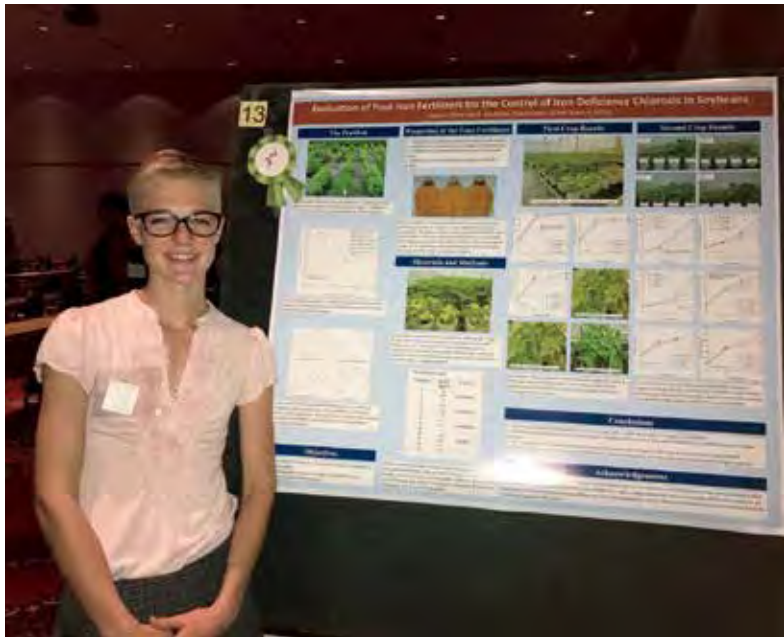


Figure 3. Difference in response of soybeans to FeEDDHA fertilizers of differing quality. FeEDDHA-1 is a high-quality fertilizer, with about 80% of its iron in the "ortho-ortho" form. FeEDDHA-2 is a lower-quality fertilizer with about 50% of its iron in the "ortho-ortho" form.

rophyll level in the leaves. All the sources greened up the soybeans very well, even at the lowest rate, so maybe, quality doesn't matter. That question was answered with our second crop. Figure 2 shows the effect of the various iron sources on the chlorophyll level of the second crop's leaves. The two lower-quality materials, FeEDDHA-2 and FeEDDHSA, did not work as well as the two higher-quality materials, FeEDDHA-1 and FeHBED. This result is shown in Figure 3, where it is obvious that the higher-quality FeEDDHA-1 provided more iron to the plants than the FeEDDHA-2 did.

Indeed, quality matters when it comes to iron fertilizers. A lower-quality product might give a nice short-term response, but the higher the quality of the fertilizer, the longer the response. Also, FeHBED appears to have promise as an iron fertilizer for North Dakota and deserves more testing.

—Story and photos by Dr. R. Jay Goos and Hannah Ohm, NDSU



Hannah Ohm, a junior soil science major at NDSU, presenting the results of her study on iron fertilizers and IDC at the North Central Extension-Industry Soil Fertility Conference. She won third place, competing against graduate students!

Best of the Best in Wheat and Soybean Research - 2017

Researchers and Extension Specialists from North Dakota State University and the University of Minnesota are working together to deliver the most current research information to help you make better management decisions on your farm. One of the highlights will be hands-on demonstrations where you get a closer look at important production and marketing tools.

Best of the Best in Wheat and Soybean Research and Marketing workshops will be held Tuesday, January 31st at the Courtyard by Marriott in Moorhead and Wednesday, February 1st at the Alerus Center, Grand Forks.

These sessions are free. Pre-registration is encouraged. CEU credits are available.

For times and to register, call (800) 242-6118, ext 3 or go online at www.smallgrains.org and click on Best of the Best link.

Brought to you by the MN Association of Wheat Growers, ND Soybean Council, MN Wheat Research & Promotion Council, ND Grain Growers Association, MN Soybean Research & Promotion Council and the ND Wheat Commission.

The Human Factor

You'd be hard pressed to find two cities more dissimilar than Ayr, North Dakota, and Beijing, China. The tiny village in Cass County where the population barely passes double digits and China's capitol with its 21 million inhabitants are connected, despite more than 6,000 miles between them.

Jim Thompson is one of those connections.

Thompson farms near Ayr. Among the crops he raises are soybeans, including non-GMO varieties that are bound for food markets in Asia. Because he knows that his soybeans are destined for overseas users, Thompson has hosted international trade teams at his farm, including an early October visit from a delegation of Chinese soybean customers.

A Chinese trade delegation member angles for the right view of some ripening North Dakota soybeans.

"As farmers, we are producing the high-quality products our customers demand," Thompson says. "It's fun for them to get a picture of our operation. It gives us a chance to show how much we care about what we produce and that we put a lot of pride in what we grow."

Boots on the Ground

Foreign trade teams are a regular sight across North Dakota, largely because soybean exports are extremely important to the state's soybean farmers.

North Dakota is the nation's second-largest whole-soybean exporting state, trailing only Indiana. The U.S. Department of Agriculture (USDA) says that the state's farmers grew about 185.9 million bushels of soybeans, valued at more than $1.63 billion, in 2015. North Dakota's 2016 soybean crop was even bigger and was estimated by the USDA to be a record 234 million bushels, up 26 percent from last year.

According to the North Dakota Soybean Council, 94 percent of the soybeans grown in North Dakota leave the state as whole soybeans. About 70 percent of them are exported globally through shipping ports in the Pacific Northwest (PNW). Because shipments from the PNW can reach Asia in an estimated 16 to 18 days, countries such as China, Taiwan, Indonesia and Vietnam find North Dakota soybeans very attractive.

Overseas markets are equally attractive to North Dakota farmers.

"We don't have much soybean processing in the state, so what would we do with all of our production?" asks Stephanie Sinner, director of market development for the North Dakota Soybean Council. "Because of international markets, North Dakota can be a world leader. We wouldn't produce nearly the volume of soybeans if those markets were taken away."

Having current and prospective buyers visit North Dakota farms is valuable trade relations for soybean

farmers, but Sinner says that the importance to customers can't be overstated.

"Many of the countries we do business with don't have the land or the technology to produce enough of their own food," Sinner says. "They're dependent on someone else to grow their food, so they want to know who is growing it."

Farmers are happy to oblige. Thompson says that trade teams are often interested in how soybeans are raised; in what technology farmers use to get real-time harvest information, such as yields; and in learning about the harvest process.

Because the Chinese delegation came during harvest, some visitors were able to join Thompson and his 8-year-old daughter in the combine as they harvested soybeans. Those rounds across the field yielded much more than just bushels.

"It's about establishing relationships," Thompson contends. "It's about having buyers understand where their food is coming from and that we are providing them with a quality product. They're able to put a face to the source of their food."

Thompson says that the point was driven home when a group from the local company to which he sells his non-GMO soybeans visited an overseas processing facility. The group found Thompson's name written on a message board, identifying him as one of the company's supplying farmers.

"I think meeting us as farmers gives buyers peace of mind and reassurance about the products they're getting," Thompson adds.

Human Economics

Because the soybean industry is global with whole beans and soybean meal traded worldwide, it's easy to forget the human component of international trade. For farmers such as Sarah Lovas from Hillsboro, North Dakota, trade teams offer a chance for a more personal approach to global business. Lovas Farms has hosted multiple trade teams over the years, including groups from Mexico and China this year.

"It's really important to remember when they're here, that they are my customer," Lovas says. "They are buying my product, my sweat, my toil. We do our best to raise a high-quality crop, and it's wonderful to be able to share that with them."

Soybean quality is important to export customers.

Lovas, a trained and practicing agronomist, often focuses her conversations with visitors on how soybeans are raised and the decisions farmers make for each crop. Those conversations often lead to discussions about sustainability, a topic that Lovas says is important to North Dakota soy customers. Standard practices that farmers use, such as soil sampling and precision agriculture techniques, help visitors to understand the lengths to which farmers go to produce a good crop while protecting resources.

"Normally, I deal with agronomics and not as much with the economics," Lovas admits. "It's a really good experience for me to see who constitutes those economics."

Producing a soybean crop and marketing it to the local elevator isn't the end of the story for North Dakota soybeans. Many soybeans will end up as feed for animals, such as hogs, chickens, ducks or even fish, halfway around the world. Some soybeans will be human food. Lovas believes that it's important for farmers to keep the end users in mind when producing their crop. It's a notion that's been strengthened by cultivating personal connections with customers.

"I've always felt there's nothing more divine than feeding a hungry world. We're able to do that," Lovas says. "I hope farmers think about where our crops are going and what is important to our end-use customers. "

Sharing information about North Dakota soybean production and sustainability is vital. Listening to the customers' wants and needs is also important.

"We need to pay attention to what our customers want because that could provide some great opportunities for us," Lovas adds.

Global soybean consumption remains strong, but so, too, does worldwide production. With strong soybean production across much of North Dakota again in 2016, farmers and soybean industry representatives will continue to focus their efforts on sustaining international markets. Many of those relationships will be supported one farm at a time.

—Story by Daniel Lemke, photos by Wanbaugh Studios

Demonstrating soybean harvest was a hit at Jim Thompson's farm.

Building Markets Abroad

U.S. soybean farmers have never produced a crop as big as they did in 2016. Additionally, North Dakota farmers have never grown as many soybeans as they did this year. The U.S. Department of Agriculture's national soybean production estimate of 4.269 billion bushels edges out 2015's crop while North Dakota's estimated 234-million-bushel harvest is the state's biggest.

With record crops in the bin, it's more important than ever that North Dakota farmers have outlets for their soybeans.

"Export markets are North Dakota markets," says Stephanie Sinner, director of market development for the North Dakota Soybean Council (NDSC). "We don't consistently have another place to sell soybeans. Exports are a key part of North Dakota soybeans' story, so it's incredibly important that we maintain and grow those markets."

Sinner says that China is still the number one consumer of U.S. and North Dakota soybeans, but China is far from the only game in town. Other Asian nations, such as Vietnam, Thailand, the Philippines, Indonesia and Malaysia, are important soy customers, particularly because North Dakota farmers have a transportation advantage over many competitors. Soybeans can leave the state and be at many Asian ports in about 3 weeks.

In addition to Southeast Asia, market growth is occurring on the Asian subcontinent. Countries such as Myanmar, Sri Lanka, Bangladesh and India are experiencing economic growth, which opens doors to new markets for North Dakota soy.

Long Term Plan

Market development doesn't occur instantly. In most cases, it takes years to develop customers and demand. North Dakota soybean farmers invest in two resources that cultivate markets.

The American Soybean Association's World Initiative for Soy in Human Health (WISHH) is the U.S. soybean growers' trailblazer for trade in long-term markets. The WISHH program focuses on technical transfer, growth to local economies, and improved nutrition to people and animals. WISHH's work paves complementary trade routes that grow U.S. soy markets.

Bangladesh and Pakistan are prime examples. WISHH worked in Bangladesh for years. Demand has risen in the country that is home to more than 168 million people and a rapidly growing middle-class economy. The country purchased more than $500 million of U.S. soy between 2010 and 2015.

"North Dakota soybean growers benefit from WISHH building food and feed markets for U.S. soy in long-term international markets," says WISHH Executive

> **"Exports are a key part of North Dakota soybeans' story, so it's incredibly important that we maintain and grow those markets."**

Director Jim Hershey. "WISHH has created U.S. soy customers in countries like Bangladesh and Pakistan as well as in Africa and Central America."

Once the strategic market-growth goals were met, WISHH transitioned Bangladesh's country programs to the U.S. Soybean Export Council (USSEC) in order to continue market development. The USSEC operates throughout Asia, Europe, North Africa and the Americas.

"USSEC's primary role is to build a preference for U.S. soy with customers around the world," says Valley City, North Dakota, farmer Monte Peterson, who was recently appointed to the USSEC board of directors. "It's important that we demonstrate the value we can provide to our customers."

In addition to building a preference for U.S. soybeans and soy products, the USSEC advocates using soy in feed, aquaculture and human consumption while also promoting soy benefits through education.

WISHH and the USSEC are now shifting responsibilities in Pakistan to further develop U.S. soy markets in the world's sixth-most populous country. During the past 20 months, Pakistan has imported more than 393,000 metric tons of whole soybeans and soybean meal, worth more than $140 million, from the United States.

WISHH is currently focusing on Myanmar and Cambodia as long-term markets. The organization recently completed a market assessment about human foods in Sri Lanka.

The North Dakota Soybean Council supports both WISHH and USSEC efforts through membership and funding for projects that specifically impact North Dakota's soybean markets.

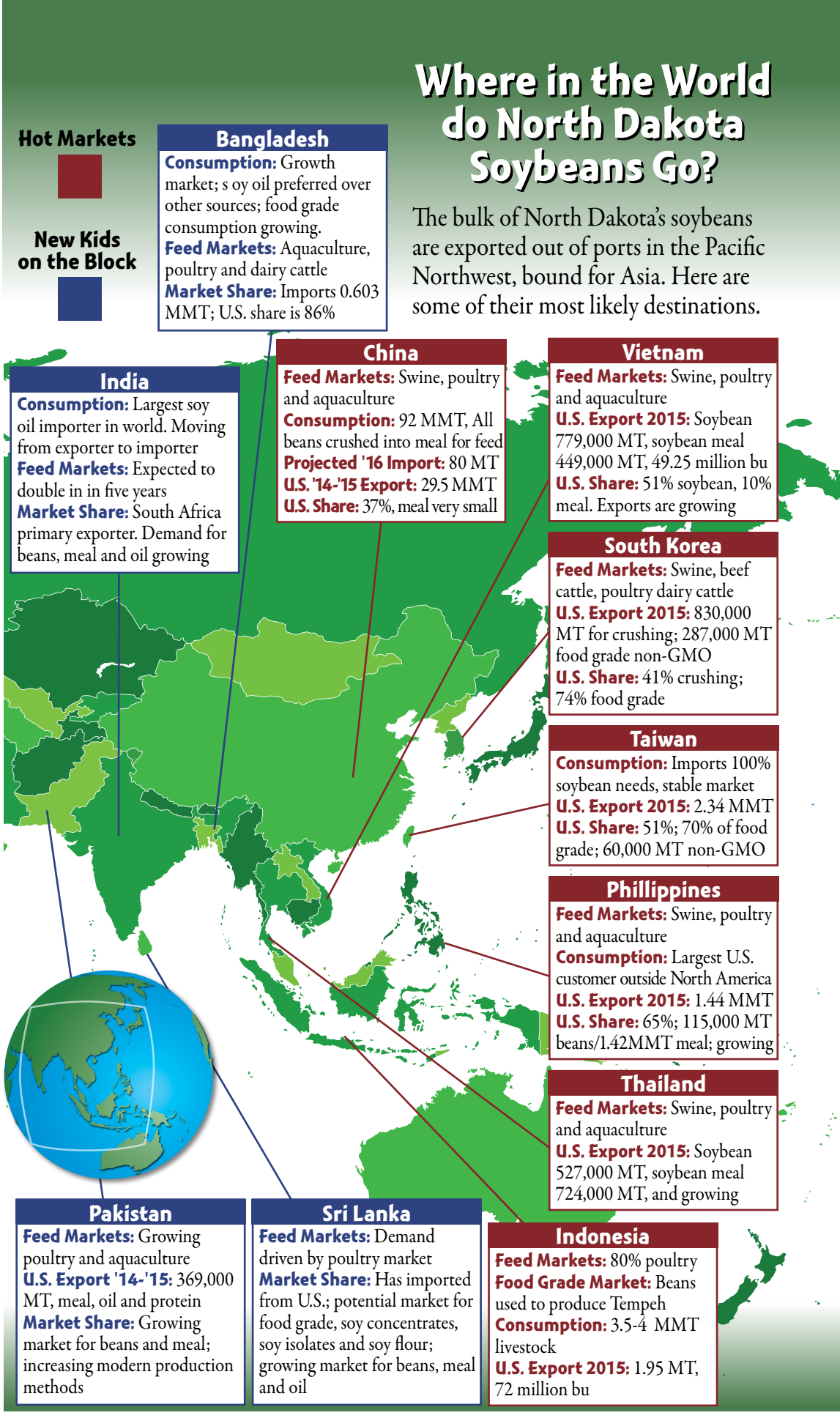
—Story and photo by Daniel Lemke

Where in the World do North Dakota Soybeans Go?

The bulk of North Dakota's soybeans are exported out of ports in the Pacific Northwest, bound for Asia. Here are some of their most likely destinations.

Hot Markets

New Kids on the Block



Bangladesh
Consumption: Growth market; s oy oil preferred over other sources; food grade consumption growing.
Feed Markets: Aquaculture, poultry and dairy cattle
Market Share: Imports 0.603 MMT; U.S. share is 86%

China
Feed Markets: Swine, poultry and aquaculture
Consumption: 92 MMT, All beans crushed into meal for feed
Projected '16 Import: 80 MT
U.S. '14-'15 Export: 29.5 MMT
U.S. Share: 37%, meal very small

Vietnam
Feed Markets: Swine, poultry and aquaculture
U.S. Export 2015: Soybean 779,000 MT, soybean meal 449,000 MT, 49.25 million bu
U.S. Share: 51% soybean, 10% meal. Exports are growing

India
Consumption: Largest soy oil importer in world. Moving from exporter to importer
Feed Markets: Expected to double in in five years
Market Share: South Africa primary exporter. Demand for beans, meal and oil growing

South Korea
Feed Markets: Swine, beef cattle, poultry dairy cattle
U.S. Export 2015: 830,000 MT for crushing; 287,000 MT food grade non-GMO
U.S. Share: 41% crushing; 74% food grade

Taiwan
Consumption: Imports 100% soybean needs, stable market
U.S. Export 2015: 2.34 MMT
U.S. Share: 51%; 70% of food grade; 60,000 MT non-GMO

Phillippines
Feed Markets: Swine, poultry and aquaculture
Consumption: Largest U.S. customer outside North America
U.S. Export 2015: 1.44 MMT
U.S. Share: 65%; 115,000 MT beans/1.42MMT meal; growing

Thailand
Feed Markets: Swine, poultry and aquaculture
U.S. Export 2015: Soybean 527,000 MT, soybean meal 724,000 MT, and growing

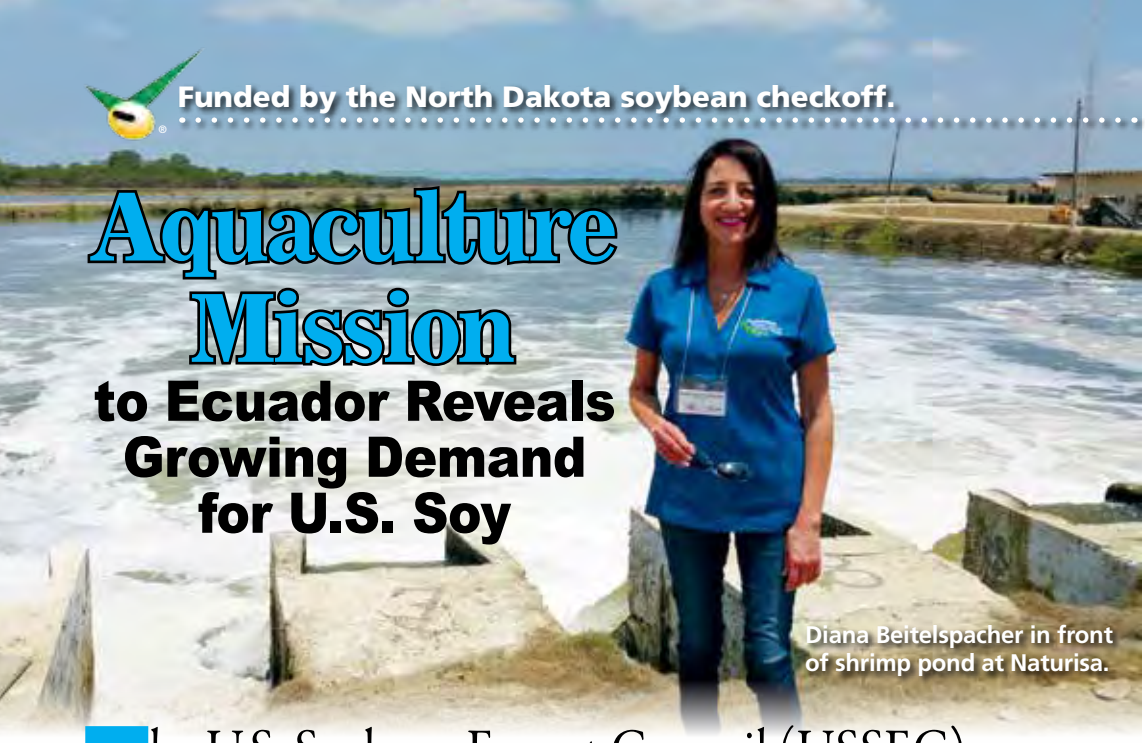
Pakistan
Feed Markets: Growing poultry and aquaculture
U.S. Export '14-'15: 369,000 MT, meal, oil and protein
Market Share: Growing market for beans and meal; increasing modern production methods

Sri Lanka
Feed Markets: Demand driven by poultry market
Market Share: Has imported from U.S.; potential market for food grade, soy concentrates, soy isolates and soy flour; growing market for beans, meal and oil

Indonesia
Feed Markets: 80% poultry
Food Grade Market: Beans used to produce Tempeh
Consumption: 3.5-4 MMT livestock
U.S. Export 2015: 1.95 MT, 72 million bu

Funded by the North Dakota soybean checkoff.

Aquaculture Mission to Ecuador Reveals Growing Demand for U.S. Soy



Diana Beitelspacher in front of shrimp pond at Naturisa.

The U.S. Soybean Export Council (USSEC) sponsored a marketing mission to Guayaquil, Ecuador, on October 20-26. The mission's purpose was to learn about the growing demand for–and use of–U.S. soy in the aquaculture industry in Ecuador and to understand what blockages are preventing the continued growth of sustainable, feed-based aquaculture. Diana Beitelspacher, North Dakota Soybean Council CEO, participated in the mission, along with representatives from the USSEC and various soybean states, including Iowa, Indiana, Delaware, Kansas and Ohio.

What is aquaculture?

- Aquaculture is the culturing or farming of aquatic species.
- Globally, seafood consumption is growing. In developing countries, we are seeing a diet change from grain and rice towards higher-value proteins. Healthy and indulged food demand is rising for wealthier consumers.
- Aquaculture is the only way to increase the seafood supply. Wild catch is fixed. Therefore, 50 percent of the industry needs to provide 100 percent of the growth.
- Aquaculture has been on the rise, 10 percent per year in the last 10 years. The key is that the growth happens sustainably and not at the detriment of our environment.
- Aquaculture farmers can only expand their productivity by increasing intensification.
- Shrimp, tilapia, catfish and many varieties of carp species are farmed in a more intensive way.
- Increasing the intensity means more feed, and this is where the connection to soybeans comes into play.

Why are U.S. soybeans important to aquaculture?

- Aquaculture is the fastest-growing use for U.S. soy.
- Soybeans are an ideal protein source for aquafeeds. The need for an economic protein source which does not come from the sea or from wild-caught populations of fish and seafood sources is on the rise due to overfishing and the rapidly declining availability of wild-caught fish in our waters.
- Aquaculture investment is creating a market which is in its infancy and will be growing at a strong pace in the coming years.
- More than 225 million bushels of U.S. soy are used for aquafeeds in the USSEC's target markets. In these same target markets, about 625 million bushels of soy are used. The U.S. has about a third of the market share for the total soy volume.
- More aquafeeds will be needed around the world, which means a higher demand for soy.

Overview of Ecuador's aquaculture industry

- Aquaculture is the fastest growing use for U.S. soy.
- Ecuador's shrimp production is the top market in Latin America.
- The common shrimp diet has soy inclusion rates that are up to 50 percent.
- Shrimp is the second-largest export item in Ecuador with total exports of $2.3 billion and approximately 277,000 metric tons produced.
- Ecuador is positioned to export more than $800,000,000 worth of shrimp in 2016.
- Ecuador is the fourth-largest exporter of shrimp in the world. (China, Vietnam and Indonesia are the top three exporters.)
- Ecuadorian importers prefer the quality of U.S. soy to soy from other origins, allowing the U.S. to gain its superior market share in the country.
- Three characteristics that distinguish Ecuadorian shrimp are flavor, texture and color.
- The average weight of Ecuadorian shrimp is 20 grams.
- Seventy percent of Ecuador's shrimp producers are family owned, small-to-medium size operators.
- The slogan used to position Ecuadorian shrimp in the international markets is as follows: "The best shrimp of the world."
- Ecuador has excellent year-round shrimp production because of geography.

Aquaculture trade team visits Alimentsa.

Shrimp ready for processing.

- Ecuador's shrimp industry generates approximately 180,000 jobs.
- The average income from shrimp production in Ecuador for 2016 (year-to-date) is $2.4 billion, 5 percent more than the previous year.
- The average shrimp production in Ecuador is 382,000 metric tons for 2016 (year-to-date), 15 percent more than the previous year.
- Worldwide, there are 50 primary markets for Ecuadorian shrimp.
- Tilapia–another aquaculture product produced in Ecuador–is produced mostly on the east coast.
- Annually, 8,000 metric tons of tilapia are produced in Ecuador.

Trade-mission visits

While the mission was focused on visits to shrimp farms, processing/packaging facilities, feed mills and laboratories, the group also visited with the owner of a large chicken hatchery (and wildlife refuge). Visits were made to the following locations:

Naturisa A shrimp farm that is in the process of entering a joint venture with Cargill. This joint venture involves the construction of a feed mill that will produce 130,000 metric tons annually and will employ 260 people when the facility is fully operational in 2017. The joint venture positions Cargill to become one of the largest shrimp producers in Latin America. Naturisa holds a 50 percent ownership in Songa, the fourth-largest shrimp processing and export plant in Ecuador. Naturisa is Ecuador's second-largest shrimp producer and the fourth-largest exporter. Naturisa's shrimp-production business in Ecuador employs more than 2,000 people and produces approximately 16,000 metric tons of shrimp which are exported to Europe, the United States and Asia.

Songa A company which produces 23,000 tons of shrimp per year on 6,500 hectares of ponds. Its goal is to increase production to 44,000 tons of shrimp per year in the next 3-5 years. Songa also has a hatchery, Macrobio, which the group visited. Songa consumes 45,000 tons of feed per year. (Thirty percent of the soy is used for feed.) Songa uses 15,000 tons of U.S. soy per year. The processing plant's capacity is 33,000 tons. Songa processes 100 tons of shrimp per day with expansion plans underway to produce 180 tons per day. Songa is the largest Ecuadorian exporter of shrimp to the United States. It exported 20,000 tons of shrimp in 2014. Songa's laboratory, Aquest, is engaged with the breeding and production of shrimp larvae. The goal is to increase the shrimp's survival rate to more than 45 percent.

PRODUMAR A polyculture farm, meaning that it traditionally raises 50 percent tilapia and 50 percent shrimp in the same pond. It has 1,339 hectares of ponds. Since 1981, it has produced 5,900 tons of shrimp and 4,000 tons of tilapia per year. The goal is to produce an additional 3,500 tons of shrimp per year in the next 3-5 years. The farm has a hatchery that is only used for tilapia fry production. The farm utilizes 8,850 tons of shrimp feed and 7,000 tons of tilapia feed per year. The company uses 30-35 percent of U.S. soy in the shrimp feed and 10-15 percent in the tilapia feed. The farm uses 5,150 tons of U.S. soy per year. The farm maintains a constant annual production thanks to Ecuador's geographical conditions which keep the water temperatures over 23 degrees Celsius during every month of the year. Nearly all their shrimp and tilapia are exported:

- 40 percent to the U.S.
- 40 percent to Europe
- 20 percent to China (tilapia only)

Alimentsa A shrimp feed company. Its production capacity is 120,000 tons per year. It produces feed for local markets. The goal is to achieve 100,000 tons per year in the next 3-5 years. The company includes between 25 and 40 percent of U.S. soy in the aqua meal that is produced. This facility has developed a strong, productive relationship with the U.S. and imports, almost exclusively, U.S. soybean meal.

Avicola San Isidro A chicken hatchery with a production capacity of 22,600,000 in 2015. The company utilizes 9,000 tons of feed per month. The hatchery use 27,000 tons of U.S. soy per year. The plant has the capacity to process 6,000 chickens per hour and 50,000 daily. Of the 450,000 chickens per week that the company raises, 200,000 of them are provided to KFC. (Sixty percent of the chickens produced go into the live market, and 40 percent go to KFC.) The company also raises 800 farrowing sows. There are 400 hectares of land on which corn, soybeans and coffee are raised. Thirty-two-day-old female chickens go to the processing plant. The live market wants yellow chicken while KFC wants white chicken because its breading does not stick to the skin of yellow chickens. Avicola's owners also have a wildlife conservation center where they take in retired and abused circus animals, including lions, sloths, monkeys, boars, sheep and large turtles.

—Story and photos by staff

A young lion greets the group.

NCI's New Soymilk and Tofu Production Equipment Will Assist in the Worldwide Promotion of Northern-Grown Soybeans

In September, the North Dakota Soybean Council (NDSC) visited and toured the Northern Crops Institute (NCI). On the tour, NCI's Food Scientist Zach Liu, Ph.D., demonstrated the new soymilk and tofu machine. The main purpose of this commercial-grade machine is to demonstrate the value and quality of northern-grown soybeans to international course participants.

Soymilk and tofu are widely consumed in Asia, and are the most recognized soy foods in western countries.

North Dakota is a global leader in producing top-quality, food-grade soybeans for the world market. Recently, the Northern Crops Institute (NCI) installed a pilot-scale soymilk and tofu processing system to promote northern-grown soybeans by demonstrating their versatility and quality to international course participants. The system, designed by NCI, consists of several pieces of equipment which are made in Japan, China, India and the U.S. This state-of-the-art system is flexible in its ability to produce soymilk and tofu which are compatible with the differing tastes and cultures in Japan, China and other areas around the world.

The new soymilk and tofu production equipment is best described as a scaled-down mimic of large, commercial production equipment. It only requires 2 kilograms of soybeans to make tofu and 1.5 kilograms of soybeans to make soymilk. This system will be used for evaluating soybean quality and demonstrating soymilk and tofu production to visitors and international short-course participants. The system will also be used to develop new products and processes for assisting customers of northern-grown soybeans.

Soybean foods (including beverages) are becoming popular because of their well-known health benefits. These benefits include, but are not limited to, preventing heart disease, reducing cancer risks, helping with obesity, aiding bone density and alleviating menopausal symptoms.

Due to these well-known health benefits, global soymilk production has grown rapidly. Traditional soymilk has been described as having a beany flavor. In China, Korea and most southeast Asian countries, people prefer this flavor. In other countries, such as India and Japan, this beany flavor is a big barrier for consumers' acceptance of soymilk. With the new processing equipment, NCI's food scientists now have the capability to make both beany-flavor soymilk and non-beany flavor soymilk.

To explain exactly what soymilk is and how it is processed, it is best to start with the simple definition of soymilk. It is a water extract of soybeans. To process soybeans into soymilk, the procedure is quite simple. First, dried soybeans need to be soaked in water for several hours. Then, the soaked soybeans are ground with water, and the resultant slurry is cooked. Finally, the slurry is filtered to obtain cooked soymilk. This technique is how traditional soymilk is processed and can then be consumed as a beverage.

Tofu is a product that is based on soymilk. To make tofu, the cooked soymilk is mixed with a coagulant or a curdling agent, such as calcium sulfate. The resulting curd can be directly consumed as a pudding or silken tofu. To make regular and firm tofu, the curd is broken and transferred to a forming box where the tofu is firmed and shaped by pressing. Tofu-making was first recorded in the Chinese Han dynasty some 2,000 years ago. There are many different types of tofu and tofu-derived products. With the NCI's new system, its food scientists now have the capability to make all types of tofu products.

The NCI and its staff would like to thank the North Dakota Soybean Council and the Northern Food Grade Soybean Association for their generous financial and overall support to purchase and install the system. This collaborative effort will assist with expanding northern-grown soybeans in the international marketplace.

—Story by Dr. Zach Liu, NCI
Photo by Betsy Armour, NCI

Protocol Verifies Soy Sustainability

For many North Dakota soybean customers, sustainability is a big deal. For most North Dakota farmers, sustainability simply means doing what they already do to consistently grow high-quality soybeans.

Sustainability is an increasingly important component of many corporate platforms. Companies are recognizing the benefits of sustainable ingredient sourcing for many reasons, including an improving brand reputation, creating additional revenue streams and meeting the stakeholders' expectations.

Companies such as Disney, General Motors, Coca-Cola and UPS to Home Depot, McDonald's and Walmart are embedding sustainability into their core business strategies. Sustainability is a focus for companies because it's important to their customers.

In an effort to meet consumer demands, global U.S. customers are, in turn, demanding sustainably produced soybeans. U.S. farmers are delivering.

Demonstrating Sustainability

According to the U.S. Soybean Export Council (USSEC), more than 90 percent of all U.S. soy farmers practice sustainable farming.

For states such as North Dakota where the majority of soybeans are produced for export, sustainability is important for market access.

The USSEC, the United Soybean Board, the American Soybean Association and affiliated state soybean boards have developed the U.S. Soybean Sustainability Assurance Protocol (SSAP) to demonstrate soybean farmers' sustainability and to set U.S. soy products apart from the competition.

The protocol is a third-party certified, aggregate approach for the sustainability performance of U.S. soybean production. The protocol assures international buyers who are seeking verification. The SSAP is recognized internationally as an effective tool to verify the sustainability of U.S. soybean farms.

The SSAP is based on four components: biodiversity, production practices, public labor health, and continuous improvement and environmental protection.

Data used to support the SSAP are regularly compiled by the U.S. Department of Agriculture and other sources that collect information from farmers through existing government programs.

Sustainability Statistics

Every day, farmers enlist multiple practices that demonstrate sustainability. Practices that farmers utilize to achieve an over-90-percent sustainability rating include

- Crop rotation: 94 percent of soybean acres are under continuously rotated planting.
- Water management: 94 percent of U.S. farmland is not irrigated.
- Reduced tillage: 70 percent of U.S. soybean acres use conservation tillage, including no-till.
- Nutrient management: 92 percent of U.S. farmers have tested their soil to maintain proper nutrient levels.
- Detailed recordkeeping: 95 percent of U.S. counties have soil maps and data online.
- Conservation: 10 percent of U.S. farmland is let out of production to protect sensitive environmental areas.

All of these practices may be standard operating procedure for farmers, but collectively, they demonstrate sustainability.

"From crop rotation and reduced tillage to nutrient and water management, it's the many things U.S. soybean farmers do that add up to the big picture of sustainability," says Rosalind Leeck, USSEC marketing director.

Exporters and buyers of U.S. soy can access soy-export sustainability certificates through a SSAP web portal. Soy shipments that have an SSAP certificate are growing rapidly. In 2014, the USSEC reported that just over 6,800 tons of U.S. soy were shipped with a certificate. By 2015, the number had climbed to 851,000 tons. So far in 2016, more than 5 million bushels of soy have been shipped with a sustainability certificate.

To learn more about the U.S. Soybean Sustainability Assurance Protocol, visit ussoy.org/ssap.

—Story by Daniel Lemke

International Marketing Continuum

World Initiative For Soy In Human Health

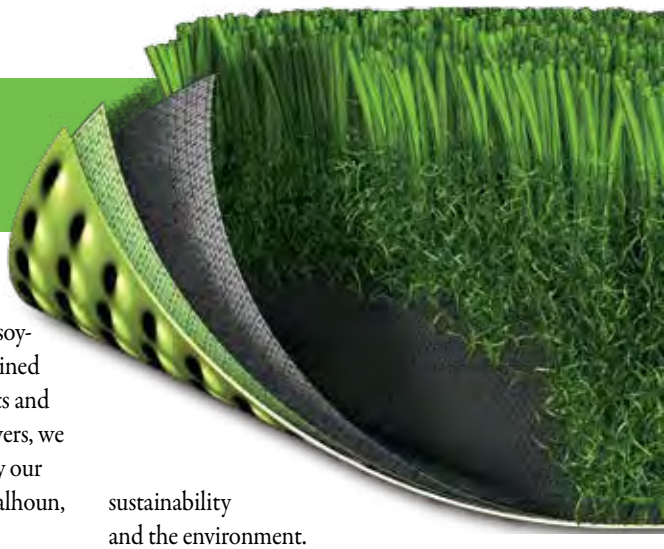
- Long term demand and market building
- Create customers and markets for U.S. soy

U.S. Soybean Export Council

- Maximize the use of U.S. soy
- Target large, or potentially large, markets
- Short-term success timeline

WISHH long-term market development	Joint market development	Market development

Soy's New Turf



Fido's play area or that new backyard golf putting green may now come with a heaping helping of soy.

Accelerated Green Works, a lawn-care and landscaping contractor based in West Fargo, North Dakota, is now partnering with one of the nation's foremost artificial turf producers. Accelerated Green Works installs SYNLawn artificial turf which includes a soy-based backing system.

"We started pursuing artificial turf for some of our clients in 2014 for pet runs and other residential applications," says Brett Kallias, Accelerated Green Works owner. "SYNLawn was one of the brands we explored and ended up utilizing because it was a top-of-the-line product with great customer service and warranty on its turf."

SYNLawn has been using soy in its turf-backing system since 2003. SYNLawn partnered with Universal Textile Technologies (UTT), the company that developed the BioCel™ technology that is used for the turf backing. UTT had been searching for renewable alternatives to petroleum and discovered that soy filled the bill.

"When we were able to see that using soy-based polymers reduced our cost, maintained quality, created more sustainable products and supported efforts with U.S. soybean growers, we knew we had a great solution for not only our industry, but many others," says David Calhoun, Product Manager for SYNLawn.

The SYNLawn backing system is made of 21.5 percent soy content. Calhoun says that their bio-based polyol replaces up to 60 percent of the petro-based polyol. UTT has been using this performance-based chemistry for more than 16 years. Calhoun explains that UTT's bio-based polyurethane technology that is used in the carpet and synthetic turf industries can be found in numerous applications, including national airports, churches, offices, casinos, synthetic turf, sports complexes and intricate landscapes, around the world.

Having soy in its products reflects SYNLawn's intent to demonstrate a commitment to sustainability and the environment.

"While the perception may still be that all artificial grass products are created equally, we are determined to help consumers understand that they can find a quality product in the marketplace that really is more environmentally friendly than the others," says Michelle Balicki, SYNLawn marketing manager. "Our mission each day is to leave the world a better place than we found it. Working with U.S. soybean farmers to foster a culture of sustainability is a gift we believe will carry on far longer than we will."

Because of SYNLawn's soy-based content, it became the first and only artificial grass manufacturer to receive a USDA Biobased label. That distinction is something that Balicki hopes will set SYNLawn apart from other artificial grass manufacturers.

"We want consumers to know that they can choose the highest-quality artificial grass without paying more and still get the 'greenest' synthetic product available," Balicki says. "By displacing much of the petroleum products normally used, we can, instead, use (a) plant-based system that is truly 100 percent recyclable and contributes to sustainability in many ways. Consumers need to be reminded and encouraged to think about buying choices that contribute to environmental concerns and make the right choices."

To learn more about SYNLawn products, visit www.synlawn.com.

—Story by Dan Lemke, photos courtesy of SYNLawn

CommonGround North Dakota: *Making Real Connections from the Farm to the Plate*

What do you get when you combine a room full of women, high-energy speakers and an amazing group of volunteers? You have a great opportunity to share the story of agriculture in a way that can make a lasting impression.

On September 19, 2016, three volunteers from CommonGround North Dakota spent part of the day at the Women's Health Conference (WHC) in Bismarck, North Dakota. Approximately 300 women from the Bismarck area attended the event which focused on self-awareness, women's health and being fit with your lifestyle choices. It was a great opportunity to answer questions about food choices and to give women a sense of empowerment when it comes to understanding their grocery cart.

Katie Heger, a CommonGround volunteer from Underwood, North Dakota, said, "Spending time at the WHC was a fabulous experience! The energy, laughter and smiles held by the women attending mirrored my excitement and enthusiasm to share with them about (CommonGround). It was a true honor to provide information about food, farming practices, soybeans and North Dakota ag with such a genuinely interested and beautiful group! I feel as if (CommonGround) provided some food for thought and left those who visited the booth with more information and a resource to turn to when they have questions! It was a wonderful way to spend a day!"

In today's world, where social media allows misinformation to be shared rampantly and quickly, this conference gave CommonGround a great opportunity to battle some of those myths and to make a real connection from the farm to the plate.

At the end of the day, one conference attendee stopped at the booth to say, "I just have to thank you for being here. Out of everyone here, hands down, I have learned the most from what you have shared. You've opened my eyes...thank you."

This event was a true testament to the importance and influence of CommonGround. These volunteer efforts bring people closer to the farm by bringing the farm closer to them. It's a great opportunity to share agricultural stories and to give a glimpse into farm life. Without volunteers who are willing to step off the farm and outside their comfort zones, these encounters wouldn't happen.

Val Wagner, the coordinator for CommonGround North Dakota and a farmer-volunteer from Monango, is looking to bring this message to more women across the state through events, such as the women's health conference, and social media. For more information or to sign on as a volunteer, contact Val at wagntales@gmail.com.

—Story and photos by Val Wagner

Katie Heger answers questions about food and farming at the Women's Health Conference in Bismarck.

Avoid Winter Weight Gain and Stay Heart Healthy

No one likes the extra calories and added pounds that can come with seasonal foods.

Between family gatherings and holiday parties, it can feel like you're running a month-long gauntlet of holiday foods. Using smart tips, substitutions and healthy choices throughout the holiday season can help you reduce your winter weight gain, stay heart healthy ... and look good in those family pictures!

Here are a few ideas to try:

When You're Eating with the Family

- Limit your sodium. Did you know that many of your favorite holiday dishes may be packed with sodium? Breads and rolls, poultry and canned soups are three common foods that can add sodium to your diet. When shopping for ingredients to prepare your holiday meal, compare the labels to find lower-sodium varieties. Use herbs and spices, such as rosemary and cloves, to flavor dishes instead of salt or butter. Choose fresh fruits and vegetables to use in your dishes. If using canned products, rinse with water in a colander before cooking and serving.
- Outsmart the bird. When turkey is on your table, reach for the lighter pieces of meat; they have fewer calories and less fat than the darker ones. Another way to cut calories is to take off the skin. Remember that a serving size of meat is 3 oz., about the size of a deck of cards. Be conscious about how much you put on your plate, and pass on that second helping. If you're also having another meat, such as ham or lamb, take smaller portions of each one.
- Watch for the gravy train. Turkey usually comes with gravy, which can add excess fat, calories and sodium. Limit gravy to a tablespoon, and keep it off other items such as the dressing.
- When it comes to dressing, call it what it is. Dressing is intended to be a complement to your meal, not an entrée. To keep calories and excess fat in check, aim for ¼ cup (about half a scoop with a serving spoon). Also, if the dressing is filled with fatty meats such as sausage and pork, looks greasy or buttery, and is made with white bread or sweet rolls, it may be best to pass. Better options would be dressings that have whole grain or cornbread, lean meat (or no meat), nuts (almonds or walnuts), and lots of veggies and fruits.
- What's in that casserole? Holiday casseroles can be filled with fat, sugar or sodium. Your best bet is to limit yourself to a small spoonful of casserole and to fill the rest of your plate with a serving of lean protein, along with roasted/sautéed veggies and tossed salad.
- The best way to enjoy an occasional dessert or sweet without losing control is by sampling a selection or two, rather than having full servings. For example, have one bite of pie, half a cookie or one small square of fudge. Find a friend or family member who will stick to the sampling rule with you and share.

When You're Doing the Cooking

Making your favorite traditions a little healthier is simple with some easy ingredient swaps to cut the fat, sodium and sugar content while still saving the season's delicious flavors.

Baking

- Instead of butter, substitute equal parts of cinnamon-flavored, no-sugar-added applesauce.
- Use lower-calorie sugar substitute.
- Substitute low-fat or skim milk instead of whole or heavy cream.
- Instead of using only white flour, use half white and half whole-wheat flour.
- Instead of adding chocolate chips or candies, use dried fruit, such as cranberries or cherries.
- Use extracts such as vanilla, almond and peppermint to add flavor instead of using sugar or butter.

Cooking

- Use vegetable oils, such as olive oil, instead of butter.
- Use whole-grain breads and pastas instead of white grains.
- Bake, grill or steam vegetables instead of frying them.
- Instead of whole milk or heavy cream, substitute low-fat or fat-free/skim milk.
- Compare the labels for your holiday ingredients; choose ones with lower sodium.

—Story and photos by Chrissy Meyer, American Heart Association

May Your Holidays Be *soy*ful

The holidays are right around the corner...again! Food is always at the center of planning. What are the traditional foods your family always looks forward to, who likes what, what can be made ahead of time and what to do with the leftovers! And of course, soyfoods can be added to any holiday table.

Many times turkey is chosen for Thanksgiving and Christmas, but many people have ham, beef, or pork. There are always leftovers to be made into sandwiches, casseroles or soups. Leftover flavors have more time to develop or marry with the other ingredients. Enjoy these recipes that use leftovers but also include some soyfoods!

—Story, recipes and photos by Linda Funk, The Soyfoods Council

White Chicken Chili

Ingredients

- 1 medium onion, finely chopped
- 3 tablespoons soybean oil
- 1 4 oz. can chopped green chilies, drained
- 3 tablespoons all-purpose flour
- 2 teaspoons ground cumin
- 2 15½ oz. cans tan or black soybeans
- 1 14½ oz. can chicken broth
- 1½ cups chopped cooked chicken, turkey or pork
- Shredded Monterey Jack cheese (optional)
- Soy sour cream (optional)
- Salsa (optional)

Directions

In large skillet, cook onion in oil for 4 minutes or until transparent. Add chilies, flour and cumin; cook and stir for 2 minutes. Add soybeans and broth; bring to a boil. Reduce heat; simmer for 10 minutes or until thickened. Add meat; cook until hot. Garnish with cheese, soy sour cream and salsa if desired.

Yield

6 servings

Toffee Bars

Ingredients

- 1 cup butter, softened
- 1 cup firmly packed brown sugar
- 1 egg yolk
- 1 teaspoon vanilla
- ¼ teaspoon salt
- 1½ cups all-purpose flour
- ½ cup soy flour
- 1 4.4 oz bar milk chocolate, melted
- ¾ cup chopped pecans

Directions

Preheat oven to 325°F. In large mixing bowl, cream butter until light. Add sugar, egg yolk, vanilla and salt and beat until well blended. Add all-purpose flour and soy flour and mix well. Spread evenly in a lightly greased 10-x15-x2-inch pan. Bake at 325 degrees for 12-15 minutes. (Watch carefully because cookies brown quickly.) Let cool for about 5 minutes. Spread with melted chocolate. Sprinkle with chopped nuts. Cool completely. Cut into bars.

Yield

Approximately 4 dozen cookies

Storage Offers One More Tool

North Dakota's record-setting soybean harvest was a boon for the state's farmers in 2016. The U.S. Department of Agriculture-National Agricultural Statistics Service (USDA-NASS) estimated that North Dakota farmers harvested 246.4 million bushels, up whopping 33 percent from last year. Harvested soybean acreage was a record 6.01 million acres, up 5 percent from a year ago. The average yield was estimated at a record 41 bushels per acre, up 8.5 bushels from 2015.

The bumper bean crop magnified the need for adequate on-farm grain storage because some farmers were forced to seek emergency storage in grain bags or machine sheds in order to house the excess grain. Compounding the space crunch brought about by the bean boom was a record North Dakota corn crop that the USDA-NASS estimated at about 445 million bushels.

On-farm grain storage offers more than a means to house and preserve grain; it gives farmers flexibility for their marketing.

"One of the big problems we have in agriculture is that we harvest everything in a month but have to spread its use out over 12 months," says Frayne Olson, North Dakota State University Extension Service crops economist and marketing specialist. "It's a constant challenge to manage the in-flow with the out-flow."

Olson says that the market sends signals if it wants more or less grain. Storage allows farmers to manage those deliveries. For example, Olson says that, in mid-October, soybean farmers in the Fargo area could realize a 17-cent-per-bushel advantage by delivering soybeans to the market in December instead of in November, a strong indication that, near harvest, the local demand for delivery was low. With the cost of on-farm storage estimated at 4 cents per bushel per month, farmers could see a 13-cent-per-bushel advantage by storing grain for one month before selling.

An Investment in the Future

Joseph Kerns operates Kerns and Associates, a multi-faceted agricultural marketing and management firm that is based in Ames, Iowa. Kerns has more than 25 years of experience working with farmers and agribusinesses. He says that, even in times with low grain prices, farmers should examine their situations to determine if they have enough grain storage.

"The value of on-farm storage is multi-fold, but what it really comes down to is having the ability to control my own destiny," Kerns says.

Kerns says that, if farmers makes a $2.50-per-bushel investment in on-farm storage and they're able to make 50 cents a bushel more because they've taken advantage of carries in the market, they've already recouped 20 percent of their investment. The economics only look better with a longer view.

"A 20 percent return would be a very sage investment," Kerns says. "You're doing something that augments the core of your grain-based business. Because storage systems can last 30 years or more, the cash return from that outlay makes it a very intelligent investment."

Olson says that, in general, most North Dakota farmers have enough on-farm storage, which he

says should equal about one year's production. However, there are instances where growers could benefit from additional capacity.

On-farm bin space can be a factor in harvest efficiency. With increasing production, many farmers are dealing with more bushels of soybeans and corn. Because of a limited harvest window, nearby storage can help keep the harvest flowing more smoothly than if grain needs to be hauled to local elevators or other commercial storage.

The traditional role of on-farm storage is to take advantage of marketing opportunities, including a shortened basis. Olson says that the basis is typically the widest at harvest, discouraging farmers from delivering grain.

"At harvest, elevators know the flood of grain is coming, but they can only handle it so fast," Olson says. "The widened basis discourages farmers from selling and provides incentive for storing and delivering later."

No Sure Thing

Olson says that part of the consideration for adding more storage boils down to who can store the grain most effectively and at the lowest cost. For years, there was a slight advantage for storing grain at country elevators, but it doesn't appear to be the case now.

"It's all about who can store the cheapest, longest and best. Right now, it looks like farmers can do it best," Olson says.

Adding bin space is no guarantee that farmers will make more money. Prices drop, making unsold stored grain worth less. There is also a substantial investment required to put up new storage, so cash-flow conditions will determine if that decision is good for each farm. Farmers are also responsible for keeping stored grain in good condition to avoid loss.

"In my view, having adequate storage is helpful to take advantage of marketing opportunities, and I believe it will continue to be an advantage. But that doesn't mean you can be complacent," Olson adds. "Profit margins are a lot thinner right now, so you have to be strategic. Storage adds to the tools farmers can use, and over the long-haul, it does pay."

Because each farm operation is different, Olson cautions farmers that adding storage is not a guarantee of increased profitability. He says that there are calculators available to help growers determine if it's a good idea for them. Iowa State University has developed a tool that Olson recommends. It can be found at www.extension.iastate.edu/agdm/decisionaidsall.html.

—Story by Daniel Lemke, photo by Wanbaugh Studios

Learning the Ropes

Abby Braaten spent her summer learning the ins and outs of soybean merchandising far away from home and a long way from where most soybeans are grown. An internship presented the perfect opportunity to get a taste of her preferred professional future.

The Wyndmere, North Dakota, native interned for Cargill. She was based in Raleigh, North Carolina, where she worked as a commodity merchant intern. The position gave her a firsthand look at the business of commodity trading.

Cargill's Raleigh office manages five soybean-crushing plants scattered across Georgia, Alabama and North Carolina. Braaten was part of the team that purchased soybeans from local elevators as well as directly from farmers.

NDSGA scholarship winner Abby Braaten is back on the NDSU campus after interning in North Carolina.

"The location offered a great opportunity to learn," Braaten says. "Raleigh is in a soybean-deficit area, so it's very different there than it is at home."

Braaten is a senior at North Dakota State University (NDSU) and is majoring in agriculture economics. She is also the 2016 recipient of the North Dakota Soybean Growers Association (NDSGA) scholarship. The scholarship provides $5,000 to an upper-class student in NDSU's College of Agriculture, Food Systems and Natural Resources, and it is designed to help further his/her education. To be eligible, applicants must be enrolled at NDSU, have completed at least 90 credits, and be the child or grandchild of an NDSGA member.

Braaten is the oldest of three children. Her parents, Andrew and Teresa Braaten, raise soybeans and corn on their Richland County farm. Because her father is an NDSGA member, Braaten was eligible for the education assistance.

"I'm honored that they chose me as the scholarship recipient," Braaten says. "I'm hoping to do what I can to keep pushing soybeans forward, so I was delighted to be selected."

The NDSGA scholarship and her summer internship helped support Braaten's drive to learn about the industry because she is hoping to pursue a career in commodity trading. Getting firsthand experience in the risk-heavy world of commodity merchandising was a perfect fit.

"I have taken commodity-trading classes and realized there is the potential to manage a lot of risk, but also the opportunity to make some money," she says. "I love the fact that it's dynamic and challenging."

Braaten is on track to graduate with her bachelor's degree in May. She is weighing her options which include continuing her education or entering the work force.

"To students interested in applying for the NDSGA scholarship, I would say take the chance and apply for the scholarship," Braaten says. "Making connections with outside organizations and businesses during college is important for building a network and especially when looking for career opportunities."

—Story and photo by Daniel Lemke

Marketing ON THE Hoof

North Dakota maintains its lofty status as the nation's second-largest exporter of whole soybeans, but soybeans aren't the only export that impacts the state's soybean farmers.

According to the North Dakota Soybean Council, 94 percent of the soybeans harvested here leave the state. About 70 percent of those soybeans are exported globally, and another 24 percent go to other states, primarily to be processed for animal feed.

Livestock is the nation's leading domestic soybean customer. Poultry, hogs and cattle all eat soybean meal: more than 28 million tons of it in 2014 according to the United Soybean Board (USB). Because large quantities of the meat and poultry produced in the U.S. are shipped around the world, global meat exports play a substantial role in adding value to North Dakota soybeans.

Bruce Schmoll

A study by Decision Innovation Solutions shows that, over the past 11 years, pork exports contributed 15.8 million tons, worth $5.5 billion, to the soybean industry. Pork exports are projected to contribute 23.6 million tons, worth $7.7 billion, to the soybean industry during the next 12 years.

U.S. Meat Export Federation (USMEF) statistics show that 2015 pork exports totaled over 2.13 million metric tons, valued at more than $5.5 billion. Beef exports of 1.06 million metric tons that same year were valued at more than $6.3 billion.

Because the bulk of the Midwestern soybean meal is used to feed hogs, pork exports are of particular value to North Dakota soybean growers. Exports accounted for 25 percent of the total U.S. pork production from January through August of 2016. Over $49 of the value for each hog grown in the U.S. can be attributed to exports.

Global Demand, Local Impact

Claremont, Minnesota, soybean farmer Bruce Schmoll is the newly elected chair of the USMEF, an organization that works across the globe to put U.S. meat on the world's table. Although he doesn't raise livestock, Schmoll recognizes the important role that animal agriculture and meat exports play in creating demand and adding value to soybeans.

"Regardless of where the soybeans go, animal agriculture creates a demand and a void that needs to be filled," Schmoll says. "It's important to have that domestic demand for soybeans."

For the U.S. pork industry, the top export markets by volume are Mexico, China and Hong Kong, Japan and Canada. By value, Japan leads the way, followed by Mexico.

Strong pork exports benefit both hog producers and soybean farmers.

Becca Nepple

Because pork is the world's most consumed animal protein, there is plenty of competition. Not long ago, Russia closed its borders to most trade, so pork that had been flowing from Europe into Russia is now being shipped to Japan, one of the United States' most important markets.

Trade agreements wield tremendous influence on market access. For example, Schmoll says that Australia has a trade agreement with Japan, giving Australian exporters tariff advantages that the U.S. doesn't currently enjoy. He says that the Trans Pacific Partnership trade agreement that the United States has signed, but which Congress has not yet ratified, would open new red-meat export markets.

Currency valuations also affect markets. A strong dollar makes U.S. products more expensive to import, sometimes limiting global demand.

"Because of access, currency and competition, U.S. pork has been at a disadvantage in many key markets," says Becca Nepple, international marketing vice president for the National Pork Board. "However, at this point in the year, we are seeing some uptick in export-sales data and bright spots in new opportunities."

Emerging Opportunities

The U.S. faces competition from pork producers in the European Union, Canada, Mexico, Brazil and Chile. However, both Nepple and Schmoll believe that there is reason for optimism.

"Exports to China have been a carrying force for us this year," Nepple says. "We understand that China will increase domestic production, and thus, imports will decrease for a period. We are seeing a lot of opportunities in Central and South America. We also see opportunities in the southeast Asian markets. South Korea and Japan are two major markets for exports."

"The opportunity for growth is tremendous," Schmoll says. "China continues to be a big pork consumer; South America is big for both pork and beef. Countries like South Korea are looking at home meal replacements, similar to a prepared dinner kit that we might serve. Hopefully, that will lead to more U.S. products going into those markets."

Schmoll says that China appears to have increased interest in reopening its market to U.S. beef which has been blocked for a number of years. Last year, China relisted a number of U.S. pork processing plants, opening them to do business with China after not accepting some U.S. pork because of concerns about the use of beta-agonists.

Pork production and pork exports have a direct influence on soybean farmers. Nepple says that soy-meal consumption by hogs is currently about 8.19 million tons per year. Growing hog numbers will create an increased need for meal. An 8.4 percent increase for pork production would require an additional 687,960 tons of meal while a 15 percent increase for pork production would mean 1,228,500 additional tons.

"The industry has a lot of pork coming on the market in late 2016 and 2017, and all of that product cannot be consumed domestically in the short term," Nepple says. "We need additional focus on export markets and have allocated more dollars to international access and marketing."

—Story by Daniel Lemke, photo by Staff and courtesy of the National Pork Board

North Dakota's Animal Ag Impact

North Dakota may not have the nation's largest animal agriculture sector, but animals do have a far-reaching affect on the state and soybean farmers.

Animal agriculture represents over $3.5 billion in economic output in North Dakota and has created 14,139 jobs according to economic analysis from the United Soybean Board. Although North Dakota ranks 26th in the nation for hogs, pork production was worth over $52.4 million.

In 2014, domestic animal agriculture consumed nearly 28 million tons of soybean meal according to the United Soybean Board (USB). North Dakota's animal agriculture consumed almost 97.1 thousand tons of soybean meal in 2014. The three segments of animal agriculture that led the state in estimated soybean meal consumption are beef cows at 53.8 thousand tons, hogs at 34.5 thousand tons and dairy cows at 3.2 thousand tons.

According to analysis from North Dakota State University, every million dollars of livestock product output results in $1.9 to $2.7 million in total economic output, generates between $310,000 and $430,000 in household wages, and is responsible for 8 to 11 additional jobs.

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TRFS Volume Standards Move to White House

The Environmental Protection Agency's (EPA) final standards for 2017 and the2018 biomass-based diesel volume for the Renewable Fuel Standard (RFS) moved to the last review step. The EPA sent the final standards to the White House Office of Management and Budget (OMB) for interagency review, which includes addressing input from the USDA and the Department of Energy.

The National Biodiesel Board (NBB) is pressing the case for stronger Biomass-based Diesel and Advanced Biofuel volumes. After the OMB review, the EPA will finalize the standards and release them publicly.

The EPA proposal calls for raising the Biomass-based Diesel volume from 2 billion gallons in 2017 to 2.1 billion gallons in 2018. Additionally, the proposal calls for increasing the overall Advanced Biofuel volume that the EPA previously set for 2016, 3.61 billion gallons, to 4 billion gallons in 2017, well below the statutorily required volume of 9 billion gallons. The American Soybean Association and the NBB have made the case to revise the volumes upward to at least 2.5 billion gallons of Biomass-based Diesel for 2018 and 4.75 billion gallons for the overall Advanced Biofuels in 2017.

China Commits to More U.S. Soy

Chinese buyers committed to purchase 5.1 million metric tons of U.S. soy, valued at $2.1 billion, at a soybean contract-signing ceremony in Des Moines, Iowa, in October.

The purchase agreements were signed by seven of the top 10 Chinese soybean buyers, including the state-owned COFCO and Sinograin as well as the privately held Sunshine group. Sellers included large grain traders such as Archer Daniels Midland, Bunge and Cargill.

Shipment details for the deals were not disclosed.

Some of the purchase agreements between U.S. exporters and buyers from China, the world's top soybean importer, are expected to be "frame contracts," with the terms to be finalized at a later date.

At a signing ceremony held in Indianapolis, Indiana, in August, Chinese importers signed letters of intent to purchase 3.9 million metric tons of new crop U.S. soy, valued at $1.78 billion.

House Passes WRDA Reauthorization Bill

The U.S. House of Representatives overwhelmingly passed a two-year Water Resources Development Act (WRDA) reauthorization bill in September, a measure supported by the American Soybean Association (ASA). The bill authorizes waterway infrastructure programs and the Harbor Maintenance Trust Fund (HMTF), which allow soybean farmers to transport their crop and to remain competitive in the global market.

The WRDA passed by the House is a modest measure that builds on the comprehensive WRDA enacted in 2014. The action demonstrates Congress' commitment and ability to return to the routine of reauthorizing the WRDA every two years.

The Senate passed its version of the WRDA bill, so the measure will go to a conference committee during the lame-duck session after the elections. Congressional leaders are optimistic that an agreement will be reached by the conference committee and that a bill will be sent to the president by the end of the year.

Passage in the House was facilitated by an agreement to include funding that addresses drinking-water issues in Flint, Michigan.

Biodiesel Heats up New York City

Lowering carbon emissions is important in the Big Apple, and biodiesel is playing a part. In October, New York Mayor Bill de Blasio signed legislation to increase biodiesel in the city's heating oil over the next two decades. Heating oil in New York City now contains two percent biodiesel, which will increase to five percent in October 2017, 10 percent in 2025, 15 percent in 2030 and 20 percent in 2034.

The first increase from a two- to five-percent biodiesel blend is expected to reduce emissions equivalent to taking 45,000 cars off the road. The final target of a 20 percent emission reduction is equivalent to removing over 250,000 cars.

This legislation is part of New York City's target to reach an 80 percent reduction in carbon emissions between 2005 and 2050.

ASA Urges Congress to Make TPP a Priority

With the election over and Congress reconvening to set their lame duck agenda, the American Soybean Association (ASA) urges Members of Congress to prioritize and pass the Trans Pacific Partnership (TPP) agreement.

"TPP passage is vital to farmers across the country, as well as the processors and exporters that take U.S. soybeans to markets around the world," says ASA President and Greenwood, Del. farmer Richard Wilkins.

With 95 percent of the world's consumers living outside of the United States, passage of TPP will open new global markets and is projected to boost farm exports by $4.4 billion each year.

"Overall, TPP has the power to create jobs at home, boost the farm economy and explore foreign markets," Wilkins says.

Soy Growers Urge Congress to Invest More in Ag, Food Research

The American Soybean Association (ASA) and other farm groups are urging Congress to invest additional funding in the U.S. Department of Agriculture's (USDA) Agriculture and Food Research Initiative (AFRI).The groups asked that $400 million be invested in the AFRI program for fiscal year 2017.

Proponents say support for this critical area has fallen significantly behind that of other scientific enterprises. Since 2003, the U.S. Department of Agriculture's research budget has risen less than 1 percent. Growth in U.S. agricultural output matched that pace while production from U.S. competitors like China has skyrocketed bolstered by a tripling of government investment in the agricultural sciences.

The groups argue that new tools and technologies are necessary for farmers to succeed. Global competition, unprecedented demand, resource constraints, emerging pests and pathogens, and volatile weather are posing new challenges for farmers.

—continued on page 34

Getting to Know the Grower

Mike Appert
Hazelton, N.D.

Tell us about your farm.

We farm in south-central North Dakota by Hazelton. The farm is 100% no-till, and we raise barley, durum, pinto beans, soybeans, corn and sunflowers. My great grandfather came from Steinen, Switzerland, and homesteaded here in 1884.

What do you like best about farming?

I like almost every aspect of farming, but I especially love to watch the crops grow each year.

What has changed most about farming since you've been involved?

The equipment has so much more capacity, technology and productivity. Massive amounts of grain come to market much faster now than 25 years ago. The 1980s were a nightmare with the trade embargo. Today, North Dakota looks like a fine-tuned machine, producing and selling agricultural products worldwide.

Did you always know farming was something you wanted to do?

Farming is all I know; I wouldn't want to do anything else.

What's most exciting about the upcoming growing (harvest) season?

We have record yields of corn and soybeans on our farm this year, and that is very exciting to see.

Has serving on the North Dakota Soybean Council been beneficial to you? Why?

It has broadened my understanding of the immense global demand for protein and the importance of increasing the protein supply. I hope that my serving has been beneficial to the Council and the soybean industry in North Dakota. I am optimistic that great talent will continue to guide the Council and (to) move the soybean industry forward in our state.

Why are soybeans part of your crop mix?

They are a profitable crop to grow, and they are an excellent rotational crop.

What is your favorite food?

For every day, pizza. For something special, a great steak.

What's the one piece of farm equipment or technology you wouldn't want to be without?

My John Deere no-till drill.

— Story by Staff, photo by Wanbaugh Studios

—continued from page 33

EPA Registers Dicamba Formulation for Use on Dicamba Tolerant Crops

EPA is registering a dicamba formulation, Xtendimax™ with Vapor Grip™ Technology, which is specifically designed to have lower volatility, to control weeds in soybean crops genetically engineered to tolerate dicamba.

This registration is for a formulation of dicamba that contains an additive that reduces volatility.

The label requires very specific and rigorous drift mitigation measures. Restrictions on the use of the product to further reduce the potential for exposure from spray drift include: no application from aircraft; no application when wind speed is over 15 mph; application only with approved nozzles at specified pressures; and buffer zones to protect sensitive areas when the wind is blowing toward them.

Weeds that are becoming increasingly resistant to glyphosate-based herbicides cause problems for farmers. This registration will provide an additional tool to reduce the spread of glyphosate resistant weeds. This final decision is designed to ensure that weed resistance is successfully managed, including reporting by the registrant to EPA of any suspected resistance, as well as remediation and grower education.

This dicamba formula for use on dicamba-tolerant soybean and cotton has been registered for sale and use in multiple states, including North Dakota.

Rehagen Named Biodiesel Board CEO

Donnell Rehagen has been selected to lead the National Biodiesel Boar as the trade group's chief executive. Rehagen was named interim CEO in June after serving 12 years as NBB's chief operating officer.

As COO, Rehagen managed the implementation and execution of NBB's budget. Additionally, Rehagen has led the annual National Biodiesel Conference & Expo, NBB's signature event that attracts thousands of enthusiasts to learn more about biodiesel and for industry professionals to network with their peers.

Prior to joining NBB in 2004, Rehagen was the fleet administrator for the Missouri Department of Transportation where he was responsible for all aspects of the department's $400 million fleet including implementation of their biodiesel (B20) use program.

The 2018 Renewable Fuel Standard's volume requirements are expected to be announced soon and Rehagen said he's hopeful the EPA will recognize the national benefits that will be realized by increasing biodiesel's requirement to 2.5 billion gallons.

—Stories by Staff

Ryan Bohnsack
Hillsboro, N.D.

Tell us about your farm.

I farm a 1,200-acre rotation of soybeans, corn and wheat. My dad, Brian, is retired but helps me a lot. I also work full time as an agricultural/business banker and a certified farm-succession coordinator at American Federal Bank in Fargo.

Does being a farmer help in that role?

It helps me understand the challenges and opportunities associated with farming, such as crop marketing, economic conditions, government programs, crop insurance, production trends, etc. It also helps to be a resource to connect people with any needs they may have for their farming business. Being an ag lender also helps me as a farmer. I am fortunate to have the opportunity to work closely with lots of great farmers and get to learn from them as well.

What is your harvest process like?

Harvest is usually a hectic, but positive, experience if the weather cooperates. In most years, it feels great to complete harvest in a timely and safe manner. Some years, you feel exhausted and frustrated during wet falls, when equipment breaks down or if the crop isn't very good. It can be hard, but it is important to take a deep breath from time to time and try to enjoy harvest time. It's also important to have fun and show appreciation for those that have helped make harvest successful.

What do you like to do outside farming?

I like to spend time with my two children, wife, family and friends. I also enjoy the lakes area, watching or playing sports, movies, reading and traveling.

What's the best part of farming?

I like the satisfaction that comes with the work of raising a crop, the relationships you build with people that help your farm to be successful and running my own business. It's also great to be able to provide jobs for people and to give back. We have a little field by our farm I plant to soybeans each year. The soybeans from this field are donated to African Soul, American Heart, which is a local non-profit that helps orphans in the Sudan and Kenya regions of Africa. We have a "sister," Rebecca, in South Sudan who we have been providing assistance to for several years, so we call that "Rebecca's field." All the soybeans from this field provide education, housing, food, clothing and books for her.

Any travel destinations or activities on your bucket list?

I went to Norway a while ago to visit an exchange student who stayed with us for a year in high school and would like to visit again someday. It would be fun to go bull riding or swine roping in Arizona with the legendary Dale Brisby. I would also like to play in the World Series of Poker one time, although I would probably be out in 10 minutes.

—Story and photo by Daniel Lemke

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