



**NCI**  
Northern Crops Institute




**ND HOUSE APPROPRIATIONS COMMITTEE**

Representative David Monson, Chairman  
House Education and Environment Division

8:30 a.m., Friday, January 11, 2019

**HB 1020**

**NORTHERN CROPS INSTITUTE**  
Budget No. 638

- Mark Jirik, Director  
Northern Crops Institute
- Greg Kessel, Chairman  
Northern Crops Council
- Dean L. Bresciani, Ph.D., President  
North Dakota State University
- Greg Lardy, Ph.D., Associate VP for Agricultural Affairs  
North Dakota State University

**NORTH DAKOTA STATE UNIVERSITY**  
**2019-2021 BIENNIAL BUDGET**

[www.ndsu.edu/legislators](http://www.ndsu.edu/legislators)



Northern Crops Institute (NCI) is an international meeting and learning center that brings together customers, commodity traders, technical experts, agricultural producers, and food and industrial processors for education, discussion and technical services. A cooperative effort between North Dakota, Minnesota, Montana and South Dakota, we work to support the promotion, market development and expanded sales of crops grown in this four state region.

Some of our accomplishments are highlighted in this material. NCI continues to focus on education and technical services as mandated in the NDCC.

The Northern Crops Institute has undergone a tremendous amount of change in the last two years with over 50% of the staff being new as a result of retirements and departures. This has resulted in us closely examining our strategy, operations, and outreach.

NCi did not request or receive any new general fund initiatives in the 2017 legislative session, and is not requesting any new initiatives for 2019-2021. Our focus has been, and continues to be on growing our revenue to cover costs by adding value to the industry. We do this by providing relevant and worthwhile courses as well as generate more fee income from the industry for our processing, baking, and analytical laboratory services.

The environment that we are operating in is significantly different than in prior years due to ongoing trade concerns and disruptions as well as changing trends in the domestic market. The mission and role of NCI is as critical today as likely any time in our history. NCI will be adding more employees funded by a combination of other state support, support from our industry partners, and fee based income. In short, as long as we are adding value for the farmers, communities, states and industries we serve, we will endeavor to earn our right to grow.

At the conclusion of this biennium ending June 30, 2019, it is anticipated that NCI will have a zero ending balance in general appropriations. The majority of general appropriations covers 10 FTE's with the remaining two FTE's covered from other funds.

HB 1020 includes a general fund budget reduction of \$94,345 from the 2017-19 biennium appropriation and recommended base increase of \$113,221 resulting in total appropriations of \$1,905,767.

For the 2019-21 biennium we are not seeking any one-time initiatives. Under a 5% budget cut as proposed by the Governor, NCI will intent to grow through the cuts by adding value to the industry and the region.

NCI continues to receive regional funding, however, without the support of the North Dakota Legislature, we would not be able to continue the level of work documented here. We appreciate your continued interest and support of the Northern Crops Institute.

Submitted by,  
 Mark Jirik, Director  
 Northern Crops Institute  
[www.northern-crops.com](http://www.northern-crops.com)  
 701-231-7736

<b>Contents</b>	
Agency Statements.....	3
Financial Audit Findings.....	4
Proposed Budget Reductions.....	5
Agency Future Critical Issues.....	6-7
Update on NCI Initiatives in 2017-2019.....	8
Comparison of 2017-2019 Appropriation and Estimated Spending.....	9
Major Components for Current Base Level.....	10
2019-2021 Needs-Based Budget.....	11
Impact Statements.....	12
Major Accomplishments.....	13-15
Partnerships, Leadership and Countries at NCI.....	16
House Bill 1020.....	17-21
NCI 2018 Annual Update.....	22-39

## **AGENCY STATUTORY AUTHORITY**

North Dakota Century Code Chapter 4-14.2.

## **AGENCY DESCRIPTION**

The Northern Crops Institute (NCI) is a cooperative effort between North Dakota, Minnesota, Montana and South Dakota to support the promotion and market development of crops grown in this four-state region. NCI brings together customers, commodity traders, technical experts, agricultural producers, and food and industrial processors for education, discussion and technical services. NCI provides technical and marketing assistance through specialized training courses and technical services that facilitate domestic and international market development and expanded sales of northern grown crops. Representatives from more than 135 countries have visited NCI since its inception. Northern Crops Institute is located on the campus of North Dakota State University.

## **AGENCY MISSION STATEMENT**

Northern Crops Institute supports regional agriculture and value-added processing by conducting educational and technical programs that expand and maintain domestic and international markets for northern-grown crops.

## **AGENCY VISION STATEMENT**

Northern Crops Institute will be the international meeting and learning center to promote the northern-grown crops of the United States.

## **AGENCY PERFORMANCE MEASURES**

NCI provides status reports to the Northern Crops Council three times annually at Council meetings (per NDCC Section 4-14.2-02 and 4-14.2-03).

Minutes and financial reports of the following meetings of the Northern Crops Council for the 2017-2019 biennium are on file at the NCI office and with NCC members. The dates of the meetings are as follows:

June 15, 2017

November 14, 2017

March 16, 2018

June 26, 2018

November 13, 2018

Next scheduled meeting is tentatively set for late February or early March 2019

Staff reports on educational courses, technical support of industry, future strategic plans, funding situation, and collaborative efforts with NCI's partners are given at each meeting.

The NCI also provides regular status reports on NCI accomplishments to other agencies and regional commodity groups that provide special (other) funds when requested. Those groups include: South Dakota and Minnesota Legislatures, Minnesota Department of Agriculture, and the commodity groups from the four-state region.

**FINANCIAL AUDIT FINDINGS**

NCI had no audit findings.



## **PROPOSED BUDGET REDUCTIONS**

In this critical stage in agriculture with a shifting international trade landscape and changing domestic consumer, ideally, we would not be facing a budget cut. We are faced with the difficult choice of cutting the important work that we are doing to support the agricultural industry, or to endure and grow through the budget cuts. Our work and our mission at this time is too critical not to move forward. Our focus has shifted from how can we cut, to how can we grow through the cuts with our other region support and technical services.

## **AGENCY FUTURE CRITICAL ISSUES**

The Northern Crops Institute was founded to promote the crops grown in North Dakota, Minnesota, Montana and South Dakota. For almost forty years, NCI has had remarkable success and evolved into a first class facility that is recognized worldwide and has earned a high level of trust for quality educational and technical expertise.

NCI is governed by the Northern Crops Council, consisting of producers from all four states as well as members of the industry. The Northern Crops Institute continues to look toward the future and endeavors to be on the leading edge of market innovation and market development. There is a belief among our stakeholders that we can be a significant agent of change for the region.

The Northern Crops Institute finds itself at a critical time of change within the organization, as well as within both the domestic and international market.

Internally, due to retirements and departures, we have seen close to 50% staff turnover in the last two years. State budget challenges have caused us to look closer at our activities and our thinking has evolved to less about we cut costs, and more about how we add value to the farmers, communities, states, and industries we serve to earn the right to grow.

We have also been challenged with some of our traditional approaches to how we conduct our courses and the structure of our organization. Getting participants from overseas continues to be a challenge due to visa concerns as well as cultural changes globally. Our use of technology and alternative educational methods have been limited to this point.

Over the last year, we have changed both the structure and positions within the organization to allow us to both expand our educational offerings as well as change some of those delivery methods. In addition, we are changing the roles to be more outward focused to increase our marketing efforts for our educational and technical service capabilities.

We are working to expand our programs for both international and domestic focused educational efforts on food, feed, and fuel. There is an increasing focus on a need for greater asset utilization and seeing the investments made by the region being put to the best use.

NCI has been fortunate to have invested in our facilities and equipment over our history, and have done so in a prudent and economic minded manner. We've utilized space, repurposed, reused, and consolidated wherever possible. However, changing food safety rules, changing industry needs, and the age of our equipment and facilities will require significant investment in the future.

Both international and domestic markets continue to present many challenges and opportunities. Recent developments in international relationships continue to highlight the need for continued education and continued focused on developing markets. While some might look at the overall situation and be disheartened, we can't lose sight of the fact that the world economy continues to grow, as does the GDP per capita.

UN projections expect total global population will grow from today's 7.6 billion people to 8.6 billion by 2050 and 11.2 billion by 2100. Recently, much of that growth has come from Asia, but it is expected that this growth will shift west to the Middle East and Africa over the coming years.

## **AGENCY FUTURE CRITICAL ISSUES (continued)**

On the back of this population growth will be rising middle class incomes and demand for more protein and better diets. The traditional progression of consumer diets has seen a shift from the basic necessities to a more complex diet that includes meat, snacks, and more convenience items.

Domestically and in other developed economies, we are seeing increasing focus on foods that are seen to be healthier and in some cases more traditional. Concepts like gut health, healthy fats, plant proteins, fermented foods, ancient grains, and heritage foods continue to gain popularity and scientific study while consumer trends around eating local, heritage foods, transparent supply chains, and foods with a story are driving what the consumer is purchasing, and in some cases how they purchase their food.

Biofuel consumption also continues to grow internationally. 2018 will be the biggest year on record for ethanol exports as other countries look to find an oxygenate that will serve their environmental and economic goals.

NCI has an important place to play in all of these markets as we focus on our mission of growing both domestic and international markets for northern grown crops and expanding value added processing.

NCI has historically been successful due to the partnerships we have developed, and that cooperation will be key to any future success. These partnerships have been focused on state level commodity groups and their national check off partners. In addition, NCI has partnered with our land grant university partners in the four respective states. Our success wouldn't be possible without the support of NDSU's Plant Science (which also encompasses the Food Science program), NDSU's Department of Agribusiness and Applied Economics, NDSU's extension programs and a host of other programs at North Dakota State University, South Dakota State University, University of Minnesota, and Montana State University.

From an international standpoint, farmers have relied on national commodity check off groups along with matching Foreign Agriculture Service funds to promote crops in overseas markets. In light of recent trade disputes, our national partners have indicated that they are expecting one time funding for new and innovative international marketing programs and they are counting on NCI to be a key part of those programs.

Domestically, we continue to build relationships with organizations that help drive domestic consumption and should allow us to expand our knowledge of current trends, and increase awareness of our capability leading us to more educational efforts and technical services.

The Northern Crops Institute is committed to our mission of growing both domestic and overseas markets for northern grown crops, as well as expanding value added agriculture. The current market environment is filled with opportunities masked as challenges. We look forward to meeting these challenges in cooperation with our partners and adding value back to the farmers, communities, businesses, and the states we serve.

**UPDATE ON NCI INITIATIVES IN 2017-2019**

NCI did not seek any new initiatives in 2017-2019.



**COMPARISON OF 2017-2019 APPROPRIATION AND ESTIMATED SPENDING**

	<b>2017-19 Appropriation</b>	<b>Actual Expenditures Through 11/30/18</b>	<b>Remaining Balance</b>	<b>Comments</b>
Total General Fund Appropriation	\$1,886,891	\$1,117,179	\$769,712	Balance will be drawn down for expenditures by end of biennium.

Source: November 2018 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds of federal grants.

**NORTH DAKOTA UNIVERSITY SYSTEM  
NORTHERN CROPS INSTITUTE  
MAJOR COMPONENTS OF CURRENT BASE LEVEL**

Salaries	\$2,645,286
Operating	\$747,435
Equipment	\$250,000
Capital Projects	-
<b>Total Budget</b>	<b>\$3,642,721</b>

Funding:	
Federal Fund	-
General Fund	\$1,886,891
Special Fund	\$1,755,830
<b>Total Funding</b>	<b>\$3,642,721</b>

Source: IBARS 2017-19, Agency Submitted

## 2019-2021 Needs-Based Budget

Reconciliation of 2017-19 Original General Fund Appropriation to  
2019-21 HB 1020

	<u>NCI</u>
<b>General Fund:</b>	
<b>2017-19 Original General Fund Appropriation(5/31/18 Approp.)</b>	<b>\$ 1,886,891</b>
<b>Base Adjustments:</b>	
Less 2017-19 One-time Appropriations	-
Less 2017-19 Capital Projects	-
<b>Total Base Adjustments</b>	<b>-</b>
<b>2017-19 Adjusted Appropriation, Less Base Adjustments- (2019-21 Base Budget)</b>	<b>1,886,891</b>
<b>Executive Recommendation Base Increases (Decreases):</b>	
4%/2% salary/benefit increase and health insurance increases	113,221
Base Budget Reduction	(94,345)
<b>2019-21 Recommended Base General Fund Increases(Decreases)</b>	<b>18,876</b>
<b>2019-21 Total Executive Recommendation - General Fund</b>	<b>1,905,767</b>
<b>Increase (Decrease) From 2017-19 Base General Fund Budget</b>	<b>18,876</b>
<b>Other Funds:</b>	
<b>2017-19 Original Other Fund Appropriation</b>	<b>\$ 1,755,830</b>
Remove Capital Project & One Time funds	
<b>2017-19 Adjusted Appropriation, Less Base Adjustments- (2019-21 Base Budget)</b>	<b>\$ 1,755,830</b>
<b>Executive Recommendation Base Increases (Decreases):</b>	
4%/2% salary/benefit increase and health insurance increases	47,678
5%/10 net reduction/increase	94,345
<b>Total Executive Recommendation Increases</b>	<b>142,023</b>
<b>2019-21 Total Executive Recommendation - Other Funds</b>	<b>\$ 1,897,853</b>
<b>Increase (Decrease) From 2017-19 Base Other Funds Appropriation</b>	<b>142,023</b>

## **IMPACT**

The Northern Crops Institute has endeavored to tell the global consumer about the quality characteristics of the crops grown in the Northern Great Plains of the United States via education and technical services. We believe that crops grown in the northern-tier of the U.S. are valued by discriminating worldwide customers and will stand the test of quality against competitors.

NCI is the prime source of technical education about the regions food grains, feed grains, oilseeds, and pulses and their value added products. We are seeing strong demand growth for our educational programs and technical services and we are exploring new and innovative ways to achieve our mission and reach an even wider audience. This is a reflection of the success of our programs to date and the credibility of the information provided through our programs.

Results from educational programs are long-term. We provide information on marketing and technical utilization of northern-grown commodities for both domestic and export markets. This service increases the possibilities of buyers using northern-grown commodities in the future. Often purchases occur several years after educational efforts when conditions become optimal for the buyers.

One of our national partners had this to say about our programs, "I'm not sure we can directly link their purchases to course attendance but it certainly has contributed to the ongoing success of their business. They not only attend the trainings themselves, but send their customers as well. We use NCI courses to support the development of African businesses."

Crops grown in the northern tier of the U.S. are valued by discriminating customers around the globe. Since 1983, NCI has hosted crop buyers, technical experts, commodity traders, processors and producers from more than 132 nations. They come to learn more about crop quality and availability. NCI does not buy or sell crops. We teach people how to use our crops in their food and feed products and how to buy them through the U.S. grain marketing system.

In 2017 and 2018, NCI trained more than 374 professionals from 43 countries in our educational programs, with 24 scheduled short courses and customized courses. Another important part of our educational program is our activity with trade teams. In the last two years, NCI hosted 102 international visitors from 11 countries representing trade missions. In addition, NCI's staff often participates in domestic and overseas programs reaching more than 1,000 buyers and processors in the last two years alone. Our website ([www.northern-crops.com](http://www.northern-crops.com)) lists information and photos on our recent programs and trade teams, and the 2018 Annual Update is included at the end of this report.

## **STATE AND REGIONAL IMPACT**

Agriculture is the economic backbone in the states of North Dakota, Minnesota, Montana and South Dakota. NCI conducts programs that focus on building relationships and developing markets for our high quality crops and value added products. Agricultural exports are extremely important to the North Dakota economy with \$4.5 billion exported in 2017 (USDA ERS). Agricultural related jobs continue to be an important share of employment in all four states. The combined value of the four-state exports of agricultural products in 2017 was \$16.2 billion, accounting for 12% of the total U.S. exports. (<http://www.ers.usda.gov/Data-products/state-export-data>).



## MAJOR ACCOMPLISHMENTS

- **International business depends on personal relationships.** Offering courses at NCI remains the best means of connecting potential customers to our state and region. The hospitality displayed in our region by NCI staff, course lecturers, regional farmers and hosts for field trips to hotel, restaurant and retail personnel create positive connections to our state and region. For many international buyers of crops, developing a relationship with the producers and visiting their farms is essential.
- **Overseas seminars and service:** In 2017 and 2018, NCI staff attended twelve international seminars, events or provided technical support in Brazil, Cambodia, China, England, Indonesia, Japan, Myanmar, Peru, Philippines, South Korea, Taiwan, Thailand and Vietnam.
- **Wheat and soybean procurement training:** In 2017 and 2018, NCI educated 67 crop buyers from 22 countries at four procurement courses. These courses teach grain merchandisers how to make more effective U.S. crop purchases while managing their risk. The procurement courses continue to utilize the NDSU electronic Commodity Trading Room (CTR), which is a high-technology room with live information feeds for financial information including equities and credit, plus commodity market information such as agriculture, energy and biofuels.
- **“Barley to Beer” was a course developed in response from barley growers, who wanted a greater understanding of the malting and brewing process.** Growers and others in the industry are often the first source of knowledge for customers and consumers, especially those that represent the industry at both domestic and international marketing events. Giving them greater knowledge allows these growers to better educate and discuss the value of the crops grown in this region.
- **“Wheat to Bread” was a course developed at the request of wheat growers who wanted a greater understanding of the quality characteristics of wheat, and what determines the value of their wheat.** It was designed for those in the industry that deal with consumers, but also those involved in variety development.
- **Technical services to processors and users of regional commodities:** Food companies, small to large, regional to multinational, use NCI’s processing capabilities to develop new or modified food products and to evaluate ingredients and processing parameters under proprietary conditions. In 2018, NCI conducted in-house processing, baking investigations, and analytical testing projects for approximately 40 entities.
- **Continued demand for pasta courses:** NCI’s pasta manufacturing courses are very unique. In fact, there are no other U.S. organizations that offer pasta processing courses. Pasta courses remain in demand by U.S. and international pasta companies. In 2018, our pasta course attracted 32 participants from 3 countries and we are looking at expanding our courses as the frozen, refrigerated and fresh pasta markets continue to expand.
- **NCI Feed Center activities:** In fiscal year 2017, the NCI Feed Center made 1,487 tons of feed – 1,235 tons for teaching animals and 252 tons for research animals. In fiscal year 2018, the center made 1,388 tons – 1,180 tons for teaching animals and 208 tons for research animals.

## MAJOR ACCOMPLISHMENTS (continued)

- **Food and feed safety education:** Feed Production Center Manager Kim Koch, Ph.D., is a Trainer of Trainers and a Lead Instructor for Human and Animal Food Preventive Controls and serves on several national committees of the Food Safety Preventive Controls Alliance – the organization charged with the implementation of the training programs in support of the current Good Manufacturing Practice, Hazard Analysis and Risk Based Preventive Controls for Human Food 21 CFR 117 and Animal Food 21 CFR 507 set forward in the Food Safety Modernization Act. Trainings began in 2016 and Koch has provided training for one human food course and five animal food courses.
- **In 2018, NCI hosted two feed manufacturing courses.** One was designed with the U.S. Grains Council and Iowa State University and utilized both online content as well as in person training held at the NCI Feed Center. The second course was held in conjunction with World Initiative on Soy in Human Health (part of the American Soybean Association) for participants from Nigeria and Cambodia and was held at both the NCI Feed Production center as well as at South Dakota State Swine Production Center and traveled through southern Minnesota.
- **In 2017, NCI successfully carried out its first INT-SOY program.** The INT-SOY (International Soybean) course was held at the University of Illinois until changes at the state level caused the course to be discontinued. With the support of the regional soy groups, the course was successfully moved to NCI. Over the last two years, 51 participants from 13 countries learned about the versatility of soybeans from feed, food, to industrial uses.
- **NCI has partnered with the NDSU Experiment Station Pilot plant to utilize their Hexane Extraction unit.** In order for new varieties of oilseeds to enter production, feeding trials of the meal are generally recommended. Outside of NDSU, there are only two other hexane extraction units in operation in North America, both with long wait times. NCI has been working closely with NDSU to market and utilize this valuable piece of equipment.
- **Teaching the value of Northern Grown Wheat:** Fourteen foreign flour millers and bakers from six countries have attended the two contracting for wheat value courses at NCI in 2017-18. At the NCI's Baking Laboratory they test their own flours procured from other countries against this regions wheat varieties in breads, cakes and other baked goods for functionality and quality. In side by side comparison, baking trials from this region win every time.
- **Pulses:** dry beans, peas, and lentils. Production of these crops has seen tremendous growth. To promote these markets, NCI offered three courses in 2017-18 which addressed their utilization, functionality, and quality characteristics. NCI staff has also been featured speakers for the pulse crops at national and international seminars. Bean and lentil production continues to expand significantly in western North Dakota and eastern Montana. NCI is also actively engaged in the "Protein Highway" project, stretching across southern Canada and the Northern Plains region of the U.S..

## MAJOR ACCOMPLISHMENTS (continued)

- **Barley craft malting initiatives:** According to the Brewers Association website, the growing U.S. craft brewing industry accounted for 25% of the total malt production in 2014 and contributed almost \$3 billion to the four state economy in 2016. NCI collaborated with NDSU Plant Sciences and the Institute of Barley and Malt Sciences on three courses teaching farmers and brewers to understand malt processing and effectively interpreting barley and malt analyses. There were a total of 78 participants that attended the courses in the past two years.
- **NCI has been actively engaging with a number of organizations that have complimentary missions such as the North Dakota Livestock Alliance.** We hosted FFA alumni leaders for leadership training and a session for resiliency and stress management for agricultural education teachers in 2018. We hosted several tours for FFA members with the hope of inspiring interest in food science, innovation, and entrepreneurship.
- **In late November through mid-December, the Northern Crops Institute hosted Dennis Hoiberg of Lessons Learnt Consulting, Melbourne, Australia.** Dennis is an expert in resiliency, stress management, and dealing with change in rural and farm economies. Dennis has over thirty years working in rural environments in Australia, New Zealand and South Africa, places that are no strangers to extreme weather, market, and financial risks. Building resilient communities with the ability to manage change is an important component of building strong agricultural communities with a value added mindset. Dennis had the chance to visit with over 1,000 individuals over twenty different presentations in the region.

## **PARTNERSHIPS AND LEADERSHIP**

- Northern Crops Institute provides leadership in North Dakota and the nation, and in return receives collaborative assistance from many companies, regional universities, organizations and individuals. Without these partnerships, NCI could not do its work.
- Educational courses are offered in partnership with American Association of Cereal Chemists (AACC), American Feed Industry Association (AFIA), American Society for Brewing Chemists (ASBC), American Soybean Association International Marketing (ASAIM), Ameriflax, Association of Oil Chemists Society (AOCS), International Association of Operative Millers (IAOM), National Grain and Feed Association (NGFA), NDSU Extension Service, U.S. Grains Council (USGC), U.S. Soybean Export Council (USSEC), World Initiative for Soy in Human Health (WISHH), U.S. Wheat Associates (USW), USA Dry Pea and Lentil Council (USADPLC), U.S. Dry Bean Council (USDDB), the USDA/FAS Cochran Program, and others. These groups assist in identifying possible participants and often provide other resources.
- Regional universities, particularly North Dakota State University, South Dakota State University, University of Minnesota, and Montana State University, make important contributions to NCI's programs through technical, scientific, and practical applications for the use of crops in food and feed processing. Significant contributions by the NDSU Departments of Agribusiness and Applied Economics, Agricultural and Biosystems Engineering, Cereal and Food Sciences, Plant Sciences, and the use of the electronic Commodity Trading Room in NDSU's Barry Hall allow NCI to offer programs with the most sophisticated information and research.
- Commodity check-off groups and their producer members in North Dakota, South Dakota, Minnesota, and Montana continue to be major partners and supporters of Northern Crops Institute. NCI staff identify new market opportunities for regional producers and design courses to focus on wheat, soybeans, corn, barley, pulses and other specialty crops.
- The Northern Crops Council, NCI's governing board of directors, continues to provide regional four-state leadership for NCI's programs and strategic planning. NCI's Industry Advisory Board, drawn from the four-state agricultural supply and processing industries and the grain trade, provides advice, lecturers, tours, and resources for NCI programs and initiatives.

## **43 Nations Learn More About Northern-Grown Crops**

In 2017 and 2018, NCI staff taught short course participants, hosted trade teams and visitors, and consulted with companies from the following countries:

Algeria	El Salvador	Mexico	Spain
Argentina	Ethiopia	Morocco	Sri Lanka
Australia	Ghana	Myanmar	Sweden
Bangladesh	Guatemala	Nigeria	Taiwan
Cambodia	Honduras	Panama	Thailand
Canada	India	Peru	The Netherlands
China	Indonesia	Philippines	Tunisia
Costa Rica	Israel	Senegal	UAE
Dominican Republic	Italy	Singapore	USA
Ecuador	Japan	South Africa	Vietnam
Egypt	Kenya	South Korea	



Introduced by

Appropriations Committee

1 A BILL for an Act to provide an appropriation for defraying the expenses of the North Dakota  
2 state university extension service, northern crops institute, upper great plains transportation  
3 institute, main research center, branch research centers, and agronomy seed farm.

4 **BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:**

5 **SECTION 1. APPROPRIATION.** The funds provided in this section, or so much of the funds  
6 as may be necessary, are appropriated out of any moneys in the general fund in the state  
7 treasury, not otherwise appropriated, and from special funds derived from federal funds and  
8 other income, to the North Dakota state university extension service, the northern crops  
9 institute, the upper great plains transportation institute, the main research center, branch  
10 research centers, and agronomy seed farm, for the purpose of defraying the expenses of the  
11 North Dakota state university extension service, the northern crops institute, the upper great  
12 plains transportation institute, the main research center, branch research centers, and  
13 agronomy seed farm, for the biennium beginning July 1, 2019, and ending June 30, 2021, as  
14 follows:

15 Subdivision 1.

16 NORTH DAKOTA STATE UNIVERSITY EXTENSION SERVICE

	Governor's		
	<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
18 Extension service	\$51,188,489	\$53,124,252	\$51,188,489
20 Soil conservation committee	<u>1,091,520</u>	<u>1,091,520</u>	<u>1,091,520</u>
21 Total all funds	\$52,280,009	\$54,215,772	\$52,280,009
22 Less estimated income	<u>26,646,689</u>	<u>27,886,984</u>	<u>26,646,689</u>
23 Total general fund	\$25,633,320	\$26,328,788	\$25,633,320
24 Full-time equivalent positions	252.98	242.51	252.98

Sixty-sixth  
Legislative Assembly

1 Subdivision 2.

2 NORTHERN CROPS INSTITUTE

3 Governor's

4		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
5	Northern crops institute	\$3,642,721	\$3,803,620	\$3,642,721
6	Total all funds	\$3,642,721	\$3,803,620	\$3,642,721
7	Less estimated income	<u>1,755,830</u>	<u>1,897,853</u>	<u>1,755,830</u>
8	Total general fund	\$1,886,891	\$1,905,767	\$1,886,891
9	Full-time equivalent positions	11.80	12.80	11.80

10 Subdivision 3.

11 UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

12 Governor's

13		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
14	Upper great plains transportation	\$22,060,242	\$22,421,422	\$22,060,242
15	institute			
16	Total all funds	\$22,060,242	\$22,421,422	\$22,060,242
17	Less estimated income	<u>18,617,068</u>	<u>18,957,222</u>	<u>18,617,068</u>
18	Total general fund	\$3,443,174	\$3,464,200	\$3,443,174
19	Full-time equivalent positions	43.88	43.88	43.88

20 Subdivision 4.

21 MAIN RESEARCH CENTER

22 Governor's

23		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
24	Main research center	\$108,642,243	\$107,032,049	\$108,642,243
25	Total all funds	\$108,642,243	\$107,032,049	\$108,642,243
26	Less estimated income	<u>59,084,828</u>	<u>58,053,640</u>	<u>59,084,828</u>
27	Total general fund	\$49,557,415	\$48,978,409	\$49,557,415
28	Full-time equivalent positions	336.12	340.05	336.12

29 Subdivision 5.

30 BRANCH RESEARCH CENTERS

Sixty-sixth  
Legislative Assembly

		Governor's		
	<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>	
1				
2				
3	Dickinson research center	\$6,825,551	\$6,707,017	\$6,825,551
4	Central grasslands research center	3,423,624	3,389,685	3,423,624
5	Hettinger research center	4,975,133	4,984,698	4,975,133
6	Langdon research center	2,964,607	2,968,417	2,964,607
7	North central research center	4,953,652	4,989,503	4,953,652
8	Williston research center	5,118,890	5,117,619	5,118,890
9	Carrington research center	<u>9,175,491</u>	<u>9,445,861</u>	<u>9,175,491</u>
10	Total all funds	\$37,436,948	\$37,602,800	\$37,436,948
11	Less estimated income	<u>20,281,691</u>	<u>20,807,242</u>	<u>20,281,691</u>
12	Total general fund	\$17,155,257	\$16,795,558	\$17,155,257
13	Full-time equivalent positions	110.29	109.81	110.29

14 Subdivision 6.

15 AGRONOMY SEED FARM

		Governor's		
	<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>	
16				
17				
18	Agronomy seed farm	<u>\$1,536,129</u>	<u>\$1,571,648</u>	<u>\$1,536,129</u>
19	Total special funds	\$1,536,129	\$1,571,648	\$1,536,129
20	Full-time equivalent positions	3.00	3.00	3.00

21 Subdivision 7.

22 BILL TOTAL

		Governor's		
	<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>	
23				
24				
25	Grand total general fund	\$97,676,057	\$97,472,722	\$97,676,057
26	Grand total other funds	<u>127,922,235</u>	<u>129,174,589</u>	<u>127,922,235</u>
27	Grand total all funds	\$225,598,292	\$226,647,311	\$225,598,292

28 **SECTION 2. ONE-TIME FUNDING.** The following amounts reflect the one-time funding

29 items approved by the sixty-fifth legislative assembly as adjusted for the 2017-19 biennium.

	<u>One-Time Funding Description</u>	<u>2017-19</u>	<u>2019-21</u>
30			
31	Seed cleaning plants	\$1,500,000	\$0

1	Junior master gardener program	15,000	0
2	Road and bridge asset management system	<u>300,000</u>	<u>0</u>
3	Total all funds	\$1,815,000	\$0
4	Total other funds	<u>1,700,000</u>	<u>0</u>
5	Total general fund	\$115,000	\$0

6       **SECTION 3. ADDITIONAL INCOME - APPROPRIATION.** In addition to the amount  
7 included in the grand total other funds appropriation line item in section 1 of this Act, any other  
8 income, including funds from federal acts, private grants, gifts, and donations, or from other  
9 sources received by the North Dakota state university extension service, the northern crops  
10 institute, the upper great plains transportation institute, the main research center, branch  
11 research centers, and agronomy seed farm, except as otherwise provided by law, is  
12 appropriated for the purpose designated in the act, grant, gift, or donation, for the biennium  
13 beginning July 1, 2019, and ending June 30, 2021.

14       **SECTION 4. DICKINSON RESEARCH EXTENSION CENTER - MINERAL RIGHTS**  
15 **INCOME.** The Dickinson research extension center may spend up to \$755,000 of revenues  
16 received during the 2019-21 biennium from mineral royalties, leases, or easements for ongoing  
17 operational expenses. Any revenues received in excess of \$755,000 may be spent only for  
18 one-time expenditures for the biennium beginning July 1, 2019, and ending June 30, 2021.

19       **SECTION 5. WILLISTON RESEARCH EXTENSION CENTER - MINERAL RIGHTS**  
20 **INCOME - REPORT.** The Williston research extension center shall report to the sixty-seventh  
21 legislative assembly on amounts received and spent from mineral royalties, leases, or  
22 easements in the biennium beginning July 1, 2017, and ending June 30, 2019, and the  
23 biennium beginning July 1, 2019, and ending June 30, 2021.

24       **SECTION 6. TRANSFER AUTHORITY.** Upon approval of the state board of agricultural  
25 research and education and appropriate branch research center directors, the director of the  
26 office of management and budget shall transfer appropriation authority within subdivisions 1, 2,  
27 4, and 5 of section 1 of this Act.

28       **SECTION 7. FULL-TIME EQUIVALENT POSITION ADJUSTMENTS.** The state board of  
29 higher education may adjust or increase full-time equivalent positions as needed for the entities  
30 in section 1 of this Act, subject to availability of funds. All full-time or part-time positions must be  
31 separate from North Dakota state university. Annually, the board shall report to the office of



1 management and budget and to the budget section any adjustments made pursuant to this  
2 section.

3 **SECTION 8. UNEXPENDED GENERAL FUND - EXCESS INCOME.** Any unexpended  
4 general fund appropriation authority to and any excess income received by entities listed in  
5 section 1 of this Act are not subject to the provisions of section 54-44.1-11, and any  
6 unexpended funds from these appropriations or revenues are available and may be expended  
7 by those entities, during the biennium beginning July 1, 2021, and ending June 30, 2023.

# Northern Crops Institute Annual Update

2018

Northern Crops Institute supports regional agriculture and value-added processing by conducting educational and technical programs that expand and maintain domestic and international markets for northern-grown crops.



Connecting in the Global Marketplace



## Director Report | Mark Jirik

2018 was a year of tremendous change both within the region, as well as within the Northern Crops Institute.

John Crabtree and Linda Briggs both retired during the course of the year. Betsy Armour departed NCI to work with Northarvest Bean Growers. All of them are missed, but this has also allowed us to look at our structure to more quickly adapt to changes in the future.



Jirik

The need for both more, and better educational efforts continues to expand. Brian Sorenson and Jena Bjertness were hired as program managers to lead and grow our educational programs and offerings. In 2018, we added several new courses and already several other new courses are in the works for 2019.

Grant Christian was brought on as Communications and Marketing Manager, a role that was changed to place greater emphasis on the marketing component – making sure people know who we are and what we can do on both education and technical services.

There are also many things that didn't change. Our mission to support regional agriculture and value added processing by conducting educational and technical programs that expand and maintain domestic and international markets for northern grown crops has not changed. Our commitment to the region we serve, the growers, and our collaborators is as strong as ever. Our passion for the success of our regions growers and communities and the impact we can have locally, regionally, and internationally continues to drive us.

## Connect with us!

Did you know you can connect with NCI in more places than just [northern-crops.com](http://northern-crops.com)? Keep current with what is happening by following, liking and sharing NCI on Facebook, Twitter, YouTube and LinkedIn.



## NCC Chair Report | Greg Kessel

Greg Kessel, a producer from Belfield, North Dakota, was re-elected as chair of the Northern Crops Council at the reorganizational meeting on June 26, 2018. Tregg Cronin, a producer from Gettysburg, South Dakota, was re-elected as the vice chair of the NCC.



Kessel

In March, the NCC heard from Kimberly Atkins, the Vice President and COO of the US Grains Council who reviewed the strategic plan and forward projections on feed grains exports, ethanol, and DDGS and program highlights for the next year. Atkins toured the NCI building, Feed Production Center, and the NDSU Commodity Trading Room at the conclusion of the meeting.

In June, US Wheat Director of Programs, Erica Oakley joined the Northern Crops Council to review US Wheat's outlook for the future and US Wheat's focus on building relationships, and markets through education, training, and demonstrating value. Oakley also highlighted the long term relationship that US Wheat and NCI have shared.

"Hearing from our partner's and their vision of the future growth of the industry helps us form the NCI's future as well and helps us understand where our future directions will be headed." Stated Kessel. "As the industry changes and with the changing trading situation, we have to be willing and able to change as well."

The Northern Crops Council, made up of producers, industry representatives, and administrators from the four state region to guide the path of the Northern Crops Institute and ensures it is carrying out its mission to support regional agriculture and value added processing by conducting educational and technical programs that expand and maintain domestic and international markets for northern grown crops.

## Table of Contents

NCI Leadership.....	2-3
Thank You.....	4-5
Highlights.....	6
Technical Services.....	7
Educational Courses.....	8-11
Global Marketing.....	12-17
NCI Staff Contact Information.....	18



## Retirements

John Crabtree retired in June after a thirty-three year career as the assistant director. John was responsible for NCI's short courses and also ended up being our international participant's main point of contact while they were here in Fargo. This ranged from airport pick up to handling any emergencies that happened along the way (of which there were a quite a few).

Linda Briggs retired in October after sixteen years as administrative assistant and office manager. Helping with the day-to-day running of the institute as well as making arrangements for the courses – she was the first point of contact for many at NCI.

We miss them both, but wish them well in retirement!



Assistant Director John Crabtree with a personalized gift for his retirement.

# 2019 COURSE SCHEDULE

**January 22-24**

Preventive Controls for Animal Food

**April 30 - May 2**

Pasta Production and Technology

**May 14-17**

Baking with Hard Red Spring Wheat

**May 20-24**

Soy Based Texturized Protein and Meat Analog

**July 30 - August 2**

Baking with Whole Wheat & Whole Grains

**August 12-16**

NCI-INTSOY

**September 9-18**

Grain Procurement Management for Importers

**September 30 - October 3**

Barley and Malt Quality:

**October 7-11**

Soybean Procurement  
Management for Importers

Other courses will be added to our schedule as the year progresses. Please check our website [www.northern-crops.com](http://www.northern-crops.com) for the most up-to-date information.

## 2018-19 Northern Crops Council (NCC)

**Greg Kessel, Chair**  
Belfield, ND  
ND Barley Council

**Tregg Cronin, Vice Chair**  
Gettysburg, SD  
SD Wheat Commission

**Dean Bresciani, Ph.D.**  
Fargo, ND  
President  
North Dakota State University

**Anthony Chavez**  
Minneapolis, MN  
Buhler Inc.

**Kris Folland**  
Halma, MN  
MN Soybean R&P Council

**Doug Goehring**  
Bismarck, ND  
Commissioner of Agriculture  
ND Department of Agriculture

**Ken Grafton, Ph.D.**  
Fargo, ND  
VP Agricultural Affairs  
North Dakota State University

**Justin Halvorson**  
Sheldon, ND  
ND Corn Growers Association

**Randy Hinebauch**  
Chinook, MT  
MT Wheat & Barley  
Committee

**Dave Katzke**  
Minneapolis, MN  
General Mills

**Mark Martinson**  
Rolette, ND  
U.S. Durum Growers  
Association

**John Swanson**  
Mentor, MN  
MN Corn R & P Council

**Todd Sinner**  
Casselton, ND  
SB&B Foods

**Greg Svenningsen**  
Valley City, ND  
ND Wheat Commission

**Vance Taylor**  
Grand Forks, ND  
North Dakota Mill

**Troy Uglem**  
Northwood, ND  
ND Soybean Council

**Ben Vig**  
Sharon, ND  
ND Oilseed Council

**Chris Westergard**  
Dagmar, MT  
Northern Pulse Growers  
Association

**Chris Wiegert**  
Watertown, SD  
Healthy Food Ingredients

# Thank You

## Thank You to All Who Supported NCI Programs and Activities in 2018

North Dakota State University	Anita Florido	Kevin Haas
Agribusiness and Applied Economics	Justin Friesz	Lindeman Farm, Brownton, MN
Frayne Olson, Ph.D.	Mike Klein	Maple River Grain & Agronomy, LLC
William Wilson, Ph.D.	Greg Oberle	Terry Johnson
David Bullock, Ph.D.	Colfax Farmers Elevator Inc.	Jeremy Rolf
Agricultural and Biosystems Engineering	Paul Sanderson	Minneapolis Grain Exchange
Kenneth Hellevang, Ph.D.	Columbia Grain	Joe Albrecht
Cereal and Food Sciences	Darren Bjornson	Mark Bagan
Clifford Hall, Ph.D.	Mike Brinda	Minnesota Barley Council
Plant Sciences	Ron DeJongh	Marvin Zutz
John Barr	CW Valley Coop	Minnesota Corn Growers Association
Paul Schwarz	Curt Bjertness	Adam Birr
Elias Elias, Ph.D.	Dakota Global	Minnesota Corn Research & Promotion Council
Rich Horsley, Ph.D.	Travis Maddock	Dwight Mork
Frank Manthey, Ph.D.	Dakota Growers Pasta Company Inc.	Minnesota Department of Agriculture
Senay Simsek, Ph.D.	Alexis Freier-Johnson	Ben Thomas
DeLane Olsen	David Hahn	Minnesota Soybean Growers Association
Kristin Whitney	Dakota Specialty Milling Inc.	Kyle Raguse
Adam's Family Farm, Grand Forks, ND	Robert Meyer	Minnesota Soybean Research & Promotion Council
ADM	De Mari Pasta Dies USA	Kim Nill
Ross Wyatt	Gabriele Cannata	Drew Parsley
AGT Foods U.S.A.	Demaco	Tom Slunicka
Eric Bartsch	Leonard De Francisci	Minnesota Wheat Research & Promotion Council
Alton Grain Terminal	Joseph De Francisci	Dave Torgerson
Scott Altoff	Al Lucia	Montana Department of Agriculture
Mark Wild	Duluth Seaway Port Authority	Ben Thomas
AmeriFlax	Kate Ferguson	Montana Wheat and Barley Committee
Sheri Coleman	Adele Yorde	Randy Hinebauch
Amity Technology LLC	Dupont	Collin Watters
Howard Dahl	David Sabbagh	National Sunflower Association
Ardent Mills	Grace Arney	John Sandbakken
Kurt Becker	Fargo Brewing Company	Natural Products Inc.
Askegaard Organic Farm, Fargo, ND	Chris Anderson	Paul Lang
Benson-Quinn Co.	Frontier Futures Inc.	Jon Stratford
Thomas Lahey	Adam Knosalla	North Dakota Agricultural Weather Network
BNSF Railway Inc.	General Mills	Daryl Ritchison
Jennie Hubert	Dave Katzke	North Dakota Barley Council
Darrell Faircloth	Genesis Feed Technologies	Steve Edwardson
Brandon Mortenson	Peter Schott	Greg Kessel
Briess Malt and Ingredients	Gillespie Family Farms, Johnson, MN	North Dakota Corn Growers Association
Cassie Poirier	Global Innovative Solutions	Justin Halvorson
Brushvale Seed Inc.	Gene Griffin	North Dakota Corn Utilization Council
Travis Meyer	Grain Millers Inc.	Dale Ihry
Buhler, Inc.	Roger Mortenson	North Dakota Department of Agriculture
Anthony Chavez	HC International, Inc.	Doug Goehring
Eugene Dust	Curt Petrich	North Dakota Farm Bureau
Michael Ehr	Healthy Food Ingredients	Jeff Missling
Aidin Milani	Jennifer Tesch	North Dakota Farmers Union
Rene Steiner	Chris Weigart	Mark Watne
Busch Agricultural Resources	Hunter Grain Company	North Dakota Grain Dealers Association
Alan Slater	Scott Murch	Stuart Letcher
Canadian Northern Railway	Insta-Pro International	North Dakota Grain Growers Association
Bryan Paskewicz	Dave Albin	Dan Wogsland
Cargill, Inc.	Katie Mayo	North Dakota Grain Inspection Service
Katie Jorgenson	Intelligent Malt	Mark Adams
April Morgan	Chris Anderson	North Dakota Mill & Elevator
Teresa Kurkowski	Katrina Christiansen, Ph.D.	Vance Taylor
Central Farm Service Elevator	Kansas State University	North Dakota Oilseed Council
Jim Schulz	Grain Science and Industry	Donna Ellison
CHS, Inc.	Shawn Thiele	Benjamin Vig
Brian Bleyl	Kelley Bean	North Dakota Soybean Council
Taylor Smalley	John Bartsch	Derik Pulvermacher
Yuxi Weng	Land O'Lakes	Stephanie Sinner
Ryan Caffrey	Scott Waldner	Harrison Weber
Dick Carlson	Legume Matrix	Nancy Johnson

*Thank You*

North Dakota Wheat Commission Neal Fisher Erica Olson Jim Peterson Greg Svenningsen	South Dakota Soybean Processors Inc. Thomas Kersting
Northharvest Bean Growers Association Tim Courneya	South Dakota State University Dairy & Food Science Dept. John Haberkorn
Northern Canola Growers Barry Coleman	Dept. of Animal Science Keith Underwood
Northern Plains Potato Growers Association Charles Gunnerson	Dept. of Biology & Microbiology Bill Gibbons
Northern Pulse Growers Association Shannon Berndt Chris Westergard	Dept. of Economics Lisa Elliott, Ph.D.
O'Leary Farm, Danvers, MN Osborn Barr Greta Bierbaum	South Dakota Wheat Commission Reid Christopherson Tregg Cronin
Prairie Aquatech Dennis Harstad	Stone Arch Commodities Hunter Kaestner
Proseed Keith Peltier	Swenson Farms, Walcott, ND
Rahr Malting Co. Jesse Theis Curt Jacobson Aaron Eernisse Xiang Yin	The Money Farm, Fargo, ND Mike Krueger
Red River Commodities Robert Majkrzak	The Scoular Company Walter Lanza
Red River Valley Sugarbeet Growers Association Duane Maatz	The Soyfoods Council Linda Funk
Richland IFC Inc. Rick Brandenburger	USDA/GIPSA/ FGIS Noah Brook
Riverbend Malting Brent Manning	U.S. Durum Growers Association Mark Martinson Deana Wiese
SB&B Foods Robert Sinner Todd Sinner	U.S. Wheat Associates Steve Wirsching
South Dakota Corn Utilization Council Lisa Richardson	University of Illinois Dept. of Agricultural & Consumer Economics Craig Gundersen, Ph.D.
South Dakota Department of Agriculture Mike Jaspers	University of Minnesota Dept. of Agronomy & Plant Genetics Seth Naeve, Ph.D. Jochum Wiersma, Ph.D.
	Valley Malt Andrea Stanley
	Wenger Manufacturing Inc. Brian Plattner

*Thank You*  
**2018 Agribusiness Sponsors!**

AgCountry Farm Credit Services  
AGT Foods  
AmeriFlax  
Arrow K Farms  
Arthur Companies Inc.  
Bay State Milling Co  
Becky and Kim Koch  
Buhler Inc.  
Colfax Farmers Elevator Inc.  
Columbia Grain International Inc.  
Dakota Growers Pasta Company EO/AA  
Healthy Food Ingredients  
Iowa Corn  
Minnesota Corn Growers Association  
ND Corn Growers Association  
ND Farmers Union Mutual Insurance  
ND Grain Dealers Association  
ND Grain Growers Association  
ND Soybean Growers Association  
North Dakota Trade Office Inc.  
Northern Canola Growers Association  
Northern Plains Potato Growers Association  
Northern Pulse Growers Association  
ProSeed  
Red River Commodities  
Richland IFC Inc.  
RRV Sugarbeet Growers Association  
Sinner Brothers & Bresnahan Farm  
Sue and David Katzke  
US Durum Growers

## NCI Thanks Outgoing NCC Members for Their Service

The Northern Crops Council is the governing body for the Northern Crops Institute. They dedicate their time and talent to making sure NCI is focused on our mission and properly utilizing the time and resources of the institute.

We would like to thank the following outgoing council members for their service: Keith Peltier, ProSeed, who served as industry representative from West Fargo, ND. Dwight Mork, producer from Bellingham, MN who represented Minnesota Corn Research and Promotion Council; and Drew Parsley, producer from Warroad, MN who represented the Minnesota Soybean Research and Promotion Council.



**Former NCI Director Mark Weber presents Keith Peltier, ProSeed, who served as industry representative from West Fargo, ND, a gavel plaque for his service.**

## A Special Thank You to Our 2018-2019 Funding Partners

Minnesota Department of Agriculture  
Minnesota Soybean Research and Promotion Council  
Minnesota Wheat Research and Promotion Council  
Montana Wheat and Barley Council  
State of North Dakota  
North Dakota Soybean Council  
Northharvest Bean Growers  
North Dakota Wheat Commission  
South Dakota Department of Agriculture  
South Dakota Soybean Research and Promotion Council  
South Dakota Wheat Commission

## 2018 Brings New Faces and Directions to NCI's Educational Efforts

NCI's 2018 educational programming got off to a great start in April with the "Pasta Production and Technology" course, and finished with the "Barley to Beer" and "Wheat to Bread" courses in November, for a total of 12 courses.

After 34 years at NCI, Assistant Director John Crabtree began a well-deserved retirement on June 29, 2018. In his role, John ran all of the educational courses at NCI, in addition to assisting in many of the day to day responsibilities under five directors.

In place of an assistant director, two program managers were hired to focus on increasing the number of educational programs that NCI offers, for both overseas as well as domestic markets, and increase the presence of NCI in the industry.

NCI welcomed Jena Bjertness and Brian Sorenson to the NCI team in July; Bjertness joined NCI from the Nutrition Lab in the Animal Science department at NDSU, and has an M.S. degree in Animal Science and a strong background in animal nutrition. NCI welcomed back Brian Sorenson who returns to NCI after seven years at Dakota Specialty Milling. He has an M.S. degree in Cereal Chemistry and a career focused on grain quality and food processing. Brian and Jena jumped right in to our busy course calendar in July, and completed the year in November.



Bjertness



Sorenson

At the request of industries, we added several new course offerings over the last year, most notably the Soybean Meal Procurement course directed to Southeast Asian buyers. In the process of organizing a number of procurement courses, NCI has looked at how we can consolidate some of our content and deliver it more effectively. In 2019, instead of having a soy procurement, food grade soy procurement, and soybean meal procurement, we will be having a general soy procurement with multiple tracks for embedded into the course for more specific requirements.

Several of our partner organizations asked that we conduct training for those farmers and partners that talk directly to customers and policy both domestically and worldwide. As one of them said, "Most people know barley goes into beer, but most don't know how it got there." As a result, we added two new courses, targeted towards our farmer board members and industry partners called, "Barley to Beer" and "Wheat to Bread."

The fast changing trade relationships highlight the need for NCI to be nimble and adjust with the needs of the industry. NCI will continue to work with our international partners such as USSEC, WISHH, US Wheat Associates, and USGC to ensure we are working hand in hand with them helping grow markets and value for our crops beyond our borders.

A key part of our mission is focusing on the domestic markets and growing value added agriculture. Going forward, we will be developing courses and programs designed for our region and serving our domestic consumers.

Part of that will be in evaluating how we can be in front of emerging trends in the market place, part of that will be working with our partners on bringing new value added products to the marketplace. An example of this is in 2019 we will be holding our first high oleic soybean oil course.

NCI will continue to leverage the strengths that we have at our disposal including a food and animal food safety experts, pilot scale processing equipment, training feed mill, and regional expertise.

## NCI Hosts Resiliency Expert Dennis Hoiberg

In late November through Mid-December, the Northern Crops Institute hosted Dennis Hoiberg of Lessons Learnt Consulting, Melbourne, Australia. Dennis is an expert in resiliency, stress management, and dealing with change in rural and farm economies. Dennis has over thirty years working in rural environments in Australia, New Zealand and South Africa, places that are no strangers to extreme weather, market, and financial risks. Building resilient communities with the ability to manage change is an important component of building strong agricultural communities with a value added mindset.



Hoiberg

Dennis had the chance to visit with over one thousand individuals and conducted over twenty different presentations; spreading his message of HOPE (Habits, Optimism, Planning, Enacting) with a blend of science, humor, and real life experience.

In early 2019, NCI will be releasing short video clips on social media highlighting the key messages that Dennis shared with the audiences.

"The receptiveness of the people, the willingness of people to listen to my message, and the willingness of people to share their experience, highlighted the need for the message." Said Hoiberg.

Dennis' trip was made possible with financial help from AgCountry Farm Credit Services, Minnesota Wheat, Minnesota Corn, and the Minnesota Department of Agriculture.



## NCI's Wenger TX-52 Twin-Screw Extruder Capabilities

The four-state region that the Northern Crops Institute serves produces a wide range of grain, pulse, and oilseed crops. Most of those crops can be utilized either solely or in combination to produce an array of food, feed, and industrial products through the use of extrusion technology. The Northern Crops Institute utilizes a Wenger Model TX-52 twin-screw, co-rotating extruder to convert northern crops into useful and nutritious food and feed as well as interesting industrial products. The Northern Crops Institute hosts visitors from around the globe to view Wenger Model TX-52 twin-screw demonstrations, attend educational courses and training seminars, and conduct product development to improve existing products or develop new products.

In recent years, twin screw extruders have seen increased utilization for new products with intricate shapes, novel ingredients, and unique sizes, which are beyond the capabilities of single-screw extrusion systems. Twin-screw extruders can fill many of these food, feed, and industrial needs. The term "twin-screw" applies to extruders with two screws of equal length, placed next to each other inside an extrusion barrel. Twin-screw extruders are much more complex than single-screw extruders, however, twin-screw extruders provide much more flexibility and better control.

The Northern Crops Institute has three extrusion experts on staff. The three staff members compliment each other in their respective areas of expertise so that a broad range of extrusion-related expertise can be provided to industry clients. Dr. Kim Koch, Feed Production Center Manager, has experience in feed and food extrusion technology theory and application throughout his career. Mr. Rilie Morgan, Process Manager, has over a dozen years of experience operating the Institute's Wenger TX-52 twin-screw extruder and has utilized many of the crops produced in the four-state region. Dr. Zach Liu, Food Scientist, has expertise in understanding chemical and physical interactions of ingredients that are processed with twin-screw extrusion technology.

The Northern Crops Institute staff employs twin-screw technology to provide client-



Wenger TX-52 Twin-Screw Extruder

**Products Range**

- \* Expanded Snacks (Baked/Fried)
- \* Breakfast Cereals
- \* Snack Pellets (Half Products)
- \* Pasta

**\* Pet food**

- \* Animal Feed - Specialty
- \* Texturized Vegetable Protein
- \* Meat Analogs
- \* Pregelatinized Flours and Meal
- \* Industrial Ingredients and more

based product development services and to provide instructional demonstrations for the Institute's educational courses. The food industry is continuously demanding new innovations and new products. Twin-screw extruders were adopted by the food industry about 30 years ago to provide new products for the food industry. Originally developed for the plastics industry, twin-screw extruders were first used by candy manufacturers for hard to extrude soft candies, but have become very popular with food, feed, and industrial products manufacturers to produce many highly specialized products.

The Institute's Wenger TX-52 twin-screw extruder system consists of several sub-components that include a live bin, a feeding screw, a preconditioning chamber, an extruder barrel, jacketed heads, rotating screws, and a cutting die head. The Institute's twin-screw has three primary processing zones: feeding, kneading, and final processing zone involving the device's twin-screws. The Institute's Wenger twin-screw extruder has greater ability and flexibility for controlling both product and process parameters than conventional single screw extruders. The twin-screw's design, allows for easy cleaning and rapid product changeover. The twin-screw extruder has more control over process and product variability due to the ability to more closely match desired shear during extruder operation. Products produced on

the Wenger TX-52 twin-screw extruder can be dried by either the Institute's Buhler OTW-50 Fluid Bed Dryer or Lincoln Air Impingement Oven/Toaster.

The Institute's Wenger TX-52 twin-screw extruder has such flexibility that it allows the production of a wide variety of high-value products at low processing volumes. Product and process parameters derived from the twin-screw extruder can closely match large scale production extruders. This fact encourages food and feed manufacturers to undergo process and product development with confidence at the Northern Crops Institute and obtain real-world information on their quest to develop new products, introduce innovation, optimize processes, introduce new ingredients in exiting products, or simply fine-tune exiting products.

The Northern Crops Institute's Wenger TX-52 Twin-screw Extruder provides an opportunity to educate food industry professionals on twin-screw extrusion technologies, to explore new ideas, to develop new processing methods, and to produce new experimental products. The Northern Crops Institute's staff has expertise to educate interested parties on twin-screw processing, to analyze unique twin-screw extrusion industry needs and apply the most pertinent and effective twin-screw technology to satisfy those needs.



## Educational Courses

### Pasta Production and Technology

Ecuador, Canada, USA • April 17-19, 2018



This course provided participants with good basic knowledge of Durum wheat, from breeding to production and quality, as well as the milling of Durum into semolina and quality analysis. Industry professionals lectured on all aspects of the equipment and commercial production of pasta from Durum and non-traditional crops. The participants received hands-on experience in the production and quality testing of pasta in NCI's pilot-scale processing and analytical laboratories.

### Tunisian Feed Manufacturing

Tunisia • July 16-20, 2018



In conjunction with the U.S. Grains Council, NCI, along with Iowa State University hosted a group of 15 feed millers for a "train the trainer" course. These individuals were tasked with managing feed milling operations installed in Tunisia with the help of the U.S. Grains Council. The group started with one week of coursework in Iowa, where they covered basic nutritional needs of animals and some feed milling techniques, along with feed mill tours. They traveled to Fargo to spend a week at the NCI feed mill with Dr. Kim Koch to cover in depth feed mill management, and enjoyed visiting a farm in Hillsboro with the help of the ND Corn Growers Association.

**The course was sponsored by:**

- U.S. Grains Council

### Southeast Asia Contracting for Wheat Value

Indonesia, Philippines, Vietnam • August 8-10, 2018



Quality control and purchasing personnel from South Asia attended the course. At the course, wheat buyers learned how to better manage supply chains and how to write contracts that accurately specify the wheat they want to purchase. The participants learned about wheat quality testing and procurement through lectures and end-product evaluations.

**The course was sponsored by:**

- U.S. Wheat Associates

## Commodity Soybean Meal Procurement Mgmt. for Importers

Myanmar, Cambodia, China • August 13-17, 2018

Participants from Myanmar, Cambodia, and China arrived at NCI in Fargo to learn about risk management in procuring U.S. soybean meal. We worked with the United States Soybean Export Council and World Initiative for Soy in Human Health to recruit participants for this course. The group started with classroom work in Fargo, and traveled to Minneapolis with a farm tour in Danvers, MN along the way; MN Soybean Research and Promotion Council assisted in arranging this farm tour. In Minneapolis, participants were able to meet with traders to discuss trade relationships, and visit a transloader and container yard to learn more about how the soybean meal gets from the field to their countries. Thanks to the North Dakota Soybean Council, the Minnesota Soybean Research and Promotion Council, and the South Dakota Soybean Research and Promotion Council for sponsoring this course.

The course was sponsored by:

- North Dakota Soybean Council
- Minnesota Soybean Research and Promotion Council
- South Dakota Soybean Research and Promotion Council



## NCI-INTSOY

Ghana, Indonesia, Myanmar, Philippines, Senegal, Sri Lanka, Japan, USA • August 19-25, 2018

NCI brought in many experts from across the grain and food industry to educate participants with a fundamental knowledge on the production and quality of soybeans, and the processing of many different food and feed products made from soy. The team assembled in Minneapolis for an opening reception, and toured Buhler's plant in Plymouth and Gillespie Farms near Johnson, MN on their way to Fargo for one day of lectures and laboratory demonstrations before traveling to South Dakota State University for additional lectures and demonstrations related to the food and feed uses of soy, including Prairie Aquatech's pilot-scale feed processing plant and fish farm. The team traveled to Mankato to visit the CHS soybean crush plant, followed by the graduation dinner with producers and staff with the Minnesota Soybean Research and Promotion Council. The team also visited the Central Farm Service shuttle-train loading facility in Randolph, MN before the conclusion of the course in Minneapolis.

The course was sponsored by:

- American Soybean Association (WISHH Program)
- Minnesota Soybean Research and Promotion Council
- North Dakota Soybean Council
- Northern Food Grade Soybean Association
- U.S. Soybean Export Council



## Grain Procurement Management for Importers

UAE, Algeria, Costa Rica, Italy, Japan, Morocco, Netherlands, Panama, Philippines, Spain, USA • September 10-19, 2018

This year's course was a wonderful opportunity to bring together 19 people from 11 countries to learn about the production, quality, storage and handling of grains produced in the four-state region that NCI represents. Professors from NDSU Department of Agribusiness and Applied Economics and industry consultants covered topics related to grain procurement and risk management, including hedging, futures, and options. Industry experts gave presentations on rail transportation, grain sampling and inspection, as well as the economic opportunities caused by weather. NCI led the class on tours at Hunter Grain Cooperative; Richtsmeier Farm (near Hunter, ND), Alton Grain Terminal Elevator, CHS Terminal Elevator in Superior, WI, and the CHS Barge Loading Facility in Savage, MN. The participants met with the Duluth Seaway Port Authority, and nine representatives of the grain trade at the Minneapolis Grain Exchange in Minneapolis. The team also enjoyed time at Itasca State Park (MN) and a charter-boat tour of the Duluth Harbor.

The course was sponsored by:

- U.S. Wheat Associates
- U.S. Grains Council





## Educational Courses

### Soy Feed Course

Nigeria, Cambodia • September 24-28, 2018



In conjunction with the World Initiative for Soy in Human Health sector of the American Soybean Association, NCI hosted eight participants from Nigeria and Cambodia to come to the Midwest and learn more about how soybean products can be used in livestock feeds. The group had some risk management and economics coursework at NCI, and then spent a few days at the feed mill with Dr. Kim Koch for some hands-on training. The group then traveled to Brookings, SD to tour their hog facility and discuss swine nutrition, they also delved in to aquaculture feeds and toured Prairie Aquatech to learn more about their process and soy product. The group then traveled to Minneapolis, with a stop in New Ulm to hear from a poultry nutritionist and a farm tour in Brownton, MN arranged by MN Soybean Research and Promotion Council. In Minneapolis, the group met with traders to discuss trade relationships, and toured the International Feed and Grain container loading facility to see how the product reaches their country.

The course was sponsored by:

- World Initiative for Soy in Human Health, American Soybean Association

### Barley & Malt Quality: Field to Brewhouse Perspective

USA • October 1-4, 2018



This year's course was held at NCI. NDSU Plant Sciences and the Institute of Barley and Malt Sciences coordinated the course. There were lectures, discussion sessions and laboratory demonstrations that provided participants with knowledge to understand malt processing and to effectively interpret barley and malt analysis.

### Food Grade Soybean Procurement Management for Importers

South Korea, Thailand, Myanmar, China, India • October 8-12, 2018



Northern Food Grade Soybean Association sponsored a Food Grade Soybean Procurement course for eight participants at NCI this fall. The participants spent most of their time learning about risk management practices, and were able to meet with food grade soybean suppliers to discuss issues that are important to both suppliers and buyers. The participants also got to tour a food grade soybean processing facility, see a demonstration on how to make soymilk, and tour American grocery stores to see what food grade soy products are available to American consumers. Finally, both suppliers and buyers of food grade soybeans presented information about their companies to help foster future trade relationships.

The course was sponsored by:

- North Dakota Soybean Council
- Minnesota Soybean Research and Promotion Council
- Northern Food Grade Soybean Association

## Barley to Beer

USA • November 14, 2018

NCI hosted an inaugural course showing farmers and people involved in various sectors of the barley industry how barley becomes beer. The group learned some basics about barley and malt production, and spent the better part of a day with a local brewer learning about the brewing industry. This course facilitated thought-provoking and productive conversations between people from all segments of the barley industry – from farmers, to elevator personnel, to industry people charged with producing beer as the end product for consumption.

The course was sponsored by:

- MN Barley
- MT Wheat and Barley
- ND Barley Council



## Wheat to Bread

USA • November 15, 2018

With the help of many commodity groups in the four state region (MN Barley, MT Wheat and Barley, ND Barley Council, MN Wheat, ND Wheat Commission, and SD Wheat), NCI hosted an inaugural set of courses showing farmers and people involved in the agriculture industry how the commodity they work with becomes a consumable – in this case, how barley becomes beer and how wheat becomes bread. The barley to beer group learned some basics about barley and malt production, and spent the better part of a day with a local brewer learning about the brewing industry. The wheat to bread group discussed wheat production basics, and spent the rest of their day working with several bakers both from industry and NCI to learn the basics of bread making and dough quality. These courses facilitated thought-provoking and productive conversations between people from all segments of their industries – from farmers, to elevator personnel, to industry people charged with producing an end product for consumption.

The course was sponsored by:

- MN Wheat
- MT Wheat and Barley
- ND Wheat Commission
- SD Wheat



## Private Courses

In addition to doing technical services, NCI hosts privately sponsored courses for companies and individuals that want to gain both the technical and scientific knowledge and the hands on processing experience. The courses can be customized to fit the needs and desires of the customers for as few as one or two people, and as many as forty. For cost of these programs, please reach out to NCI staff.

**PRIVATE COURSES AVAILABLE**

PLEASE INQUIRE TO LEARN MORE



# Global Marketing

Algeria...Cambodia...Canada...China

Costa Rica...Ecuador...Ghana

India...Indonesia...Italy...Japan

Morocco...Myanmar...Netherlands...Nigeria

## Buyers from 27 Nations Educated by NCI in 2018

Panama...Philippines...Senegal...Singapore

South Korea...Spain...Sri Lanka...Thailand

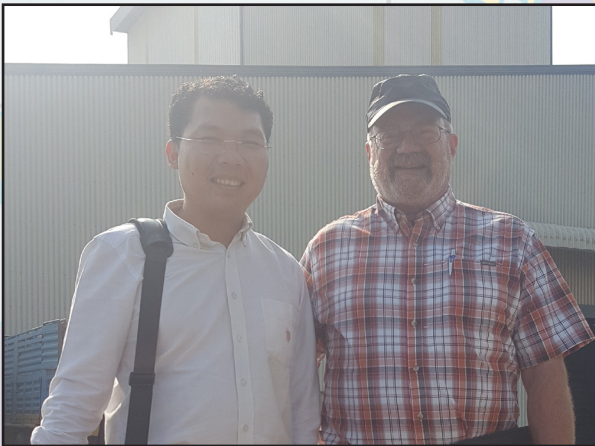
Tunisia...United Arab Emirates...

United States of America...Vietnam



### Prior Lake, MN USA | March 5-7

MN Grain and Feed held a Preventive Controls for Animal Food Safety, PCQI, course. Feed Production Center Manager Kim Koch, David Fairfield of National Grain and Feed Association (NGFA), and Doug Mancini of the MN Dept. Ag, were the instructors.



### Cambodia | April 2-11

Feed Production Center Manager Kim Koch attended the International Food Technology Program in Cambodia. The event was sponsored by World Initiative for Soy in Human Health (WISHH) which is a subsidiary of the U.S. Soybean Export Council (USSEC) as they branch out into animal food production. He had meetings with representatives of five animal food companies, visited three production sites and delivered a two day seminar to Agri-Master Ltd., the largest animal food producer in Cambodia.



### China | April 12-14

Food Scientist, Zhisheng (Zach) Liu, attended the China International Soyfood Processing Technology and Equipment Exhibition. NCI had an exhibit during the meeting. Zach was also invited by the North Dakota Trade Office to deliver a presentation titled "Introduction of North Dakota IP Soybeans" to attendees.



### Hutchinson, MN USA | April 28

Feed Production Center Manager Kim Koch, attended a one day seminar sponsored by Form-A-Feed for their personnel to share with them the latest developments in pelleting equipment, production techniques, and to allow them to ask questions. He and Alan Vering of California Pellet Mill were the presenters.

### 2018 AOCs Annual Meeting & Expo May 6-9

Minneapolis, Minnesota, USA



### Minneapolis, MN USA | May 6-9

Neil, Zach and Kim attended the American Association of Oil Chemists Annual Meeting & Expo. The expo is a premier international science and business forum on fats, oils, surfactants, proteins and related materials. It was also a good opportunity to learn and connect with other professionals in industry and academia.



### Cambodia, Myanmar | June 11-23

Food Scientist, Zhisheng (Zach) Liu, was invited by ASA WISHH to take a trip to Cambodia and Myanmar. This trip was funded by the North Dakota Soybean Council. During the trip, Zach visited 8 soy foods companies in three cities. These companies received US food grade soybean samples and are interested in buying US soybeans because of quality and price. Through each technical problem/question Zach always validated the necessity of using/purchasing US food grade identity preserved soybeans.



### Ecuador, Chili | June 29

Northern Crops Institute welcomed trade teams from Ecuador and Chili. The North Dakota Wheat Commission hosted the team.



# Global Marketing



## Ames, IA USA | July 9-20

Feed Production Center Manager Kim Koch attended a program that was sponsored by U.S. Grains Council (USGC) using funding from a USDA grant to prepare a group of Tunisia feed industry professionals to become instructors in the “new” feed technology training center that is being created in Tunis. The program was split between Iowa State University and Northern Crops Institute; with ISU doing theory of feed technology and NCI doing practical application using the NCI feed center for “hands-on” training.



## Mexico | July 10

Northern Crops Institute welcomed the trade team from Mexico. The North Dakota Barley Council hosted the team.



## Las Vegas, NV USA | July 13-18

Food Scientist, Zhisheng (Zach) Liu, attended the IFT Annual Meeting & Expo. This event showcases products like food ingredients, equipment, processing, and packaging suppliers etc. in the food & beverage industry. It was a good opportunity to learn and connect with other professionals in industry and academia.



## Japan | July 27

Northern Crops Institute welcomed the trade team from Japan. The North Dakota Wheat Commission hosted the team.



## Kansas City, MO USA | August 28-30

Neil, Zach and Brian attended the 2018 U.S. Soy Global Trade Exchange & Midwest Specialty Grains Conference & Tradeshow. NCI was an exhibitor at the Expo, allowing us to make new connections and re-connect with many of the key people in the various industries. Of special note, the team of ten Indonesian participants of the NCI-INTSOY course also attended the GTE, and NCI held an award ceremony to mark their completion of a two-week collaborative program by NCI and Midwest Shippers Association that was sponsored by the USDA-Cochran Fellowship program (August 19-25).



## Philippines, Vietnam | Aug 31-Sept 9

Feed Production Center Manager Kim Koch, presented on the current status of animal food manufacturing processes and trends (including the production and use of "fullfat" soybean meal) at a Feed Technology and Nutrition program in Manila, Tagbilaran and Ho Chi Minh.



## New Ulm, MN USA | September 24-29

Feed Production Center Manager Kim Koch, presented at a WISHH/USSEC animal food technology and nutrition program with participants from Cambodia and West Africa. Participants did "hands-on" exercises using the NCI feed center and traveled to SDSU for presentations on swine and aquaculture nutrition and a visit to Prairie Aquatech and poultry nutrition in New Ulm, MN.



## St. Louis, MO USA | October 12-18

Natsuki Barber, Food Scientist, assisted the US Dry Bean Council to put together a roasting and frying bean snack course along with Buhler Inc. and Heat and Control. 24 participants from Southeast Asia learned how to make roasted and fried snacks with the US dry beans.





## Indonesia | October 18-19

Director Mark Jirik attended the International Conference on Science, Technology, and Humanities hosted by Udayana University in Badung, Bali, Indonesia. The focus of the conference was on global partnerships for advancing innovation. His presentation was focused on the collaboration done at NCI in both showing the value of the commodities grown in northern region of the US, as well as helping educate global consumers in how they can use those commodities to improve lives around the world.



## England | October 21-23

Kim, Natsuki and Rachael attended the Cereal and Grains Association meeting. Kim presented on the importance of cereal and grains in animal nutrition (pet and food animal) and a “crystal ball” look at how the demand for animal food products (meat, milk and eggs) will continue to grow and how cereal and grains production must increase to meet the challenge. He is also the chair of the Scientific Advisory Committee which helps guide association planning.



## Minneapolis, MN USA | Oct 22-24

Program Manager, Jena Bjertness, attended the U.S. Grains Council's Global Trade Exchange in Minneapolis. This event provided an opportunity for global customers to network with suppliers, and for trade relationships to be established. Current U.S. trade policies were addressed in detail, along with issues facing the various corn and coarse grains markets.



## Tampa, FL USA | Oct 31 - Nov 2

Mark Jirik and Brian Sorenson attended the USW/NAWG Joint Fall Meeting, in Tampa, Florida. Jirik gave a presentation to the USWA Grain Quality Subcommittee, updating them on the personnel changes and NCI's commitment to wheat-based educational programs.



## Taiwan, China, Japan | Nov 12-20

Program Manager, Brian Sorenson, participated in the 2018 USW Crop Quality Seminars in Taiwan, China and Japan in November, presenting the quality data on the 2018 Hard Red Spring wheat crop to grain buyers, millers, bakers and government officials. Greg Svenningsen, representing the North Dakota Wheat Commission on the Northern Crops Council, also participated in the USW CQ Tour, with a presentation highlighting his family farm and passion for producing wheat.



## Brazil | Nov 30 - Dec 7

Feed Production Center Manager Kim Koch, presented at a Preventive Controls for Animal Food course, delivered for Inter-American Institute for Cooperation on Agriculture (IICA) in Campinas, Brazil. This was a three day PCQI course followed by a two day Lead Instructor course for those who qualified.



## St. Louis, MO USA | December 4-6

Program Managers Brian Sorenson and Jena Bjertness attended meetings for the various national soy groups: United States Soybean Export Council (USSEC), American Soybean Association (ASA), and United Soybean Board (USB). These meetings highlighted the missions and areas of concentration for the groups in the coming year, and progress that has been made on the missions of the past year. Areas of concentration included soy foods and oils, soybean meal, and sustainability for the future.

## NCI Product and Process Development

NCI's technical staff has worked with food processors and ingredient suppliers, large to small, established to start-up from all over the globe.

Our technical staff has experience in extrusion, post-extrusion, pasta manufacturing, milling and baking. We can assist in developing fresh/pre-cooked/frozen pasta, noodles, couscous, expanded snacks, texturized foods, imitation extruded foods, ready-to-eat cereals (expanded and flaked), expanded snack foods, and industrial products from food grade materials.

### We offer:

- Cost effective service fees
- Confidentiality
- Complete services, including purchase of ingredients (specialty ingredients are supplied by client — other ingredients provided at cost)
- Laboratory for proprietary use (upon approval).

For more information about our technical services, go to: <http://bit.ly/NCIProductDevelopment>





Northern Crops Institute  
 North Dakota State University  
 Dept. 7400  
 P.O. Box 6050  
 Fargo, ND 58108-6050

Non-Profit Org.  
 U.S. Postage  
 PAID  
 Permit No. 818  
 Fargo, ND

ADDRESS SERVICE REQUESTED

2018 Annual Update

*Offering Technical Services and Educational Opportunities*

**Educational Courses:**

- Value-enhanced uses
- Grain standards and inspection
- Procurement, risk management
- Quality, processing and milling
- Extrusion technology
- Pasta processing
- Feed milling and manufacturing
- Customized seminars
- Soyfoods

**Technical Services:**

- Pilot-Scale Processing
- Milling
- Baking
- Pasta processing
- Oilseed cold pressing
- Extrusion
- Post-extrusion
- Feed
- Industrial

**NCI Provides:**

- Skilled staff
- Up-to-date information
- Fully-equipped labs
- Hands-on experience
- Extrusion
- Confidential environment
- Network of resources

**NCI Staff**

Mark Jirik, director  
 Brian Sorenson, program manager  
 Jena Bjertness, program manager  
 Grant Christian, communications & marketing manager  
 Janel Brooks, account technician  
 Neil C. Doty, Ph.D., technical director (consultant)  
 Kim Koch, Ph.D., feed production center manager  
 Natsuki Barber, food scientist  
 Rachel Carlson, food technologist  
 Rilie Morgan, process project manager  
 Zhisheng (Zach) Liu, Ph.D., CFS, food scientist  
 Vanessa Johansen, processing technologist

**Connect with us:**

Northern Crops Institute  
 NDSU Dept. 7400  
 P.O. Box 6050  
 Fargo, ND 58108-6050  
 Phone: (701) 231-7736  
 Fax: (701) 231-7235  
 E-mail: nci@ndsu.edu

NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsu.eoaa@ndsu.edu.  
 This publication will be made available in alternative formats for people with disabilities upon request, 701-231-6538.