



2021-2023 BIENNIAL BUDGET

NORTHERN CROPS INSTITUTE
Budget No. 638

Wednesday, January 20, 2021 at 11:00am
SB 2020

ND SENATE APPROPRIATIONS COMMITTEE

Senator Ray Holmberg, Chairman | Senate Appropriations Committee

NORTHERN CROPS INSTITUTE REPRESENTATION

Tregg Cronin, Chairman | Northern Crops Council

Dean L. Bresciani, Ph.D., President | North Dakota State University

Greg Lardy, Ph.D., Vice President, Agricultural Affairs | North Dakota State University

Mark Jirik, Director | Northern Crops Institute

NORTHERN CROPS INSTITUTE

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AGENCY OVERVIEW

Agency Statutory Authority

North Dakota Century Code 4.1-15.

Major Statutory Responsibilities

The Northern Crops Institute shall provide technical and marketing assistance through specialized training courses and technical services that facilitate domestic and market development and expanded sales of northern grown crops. The institute shall render services including:

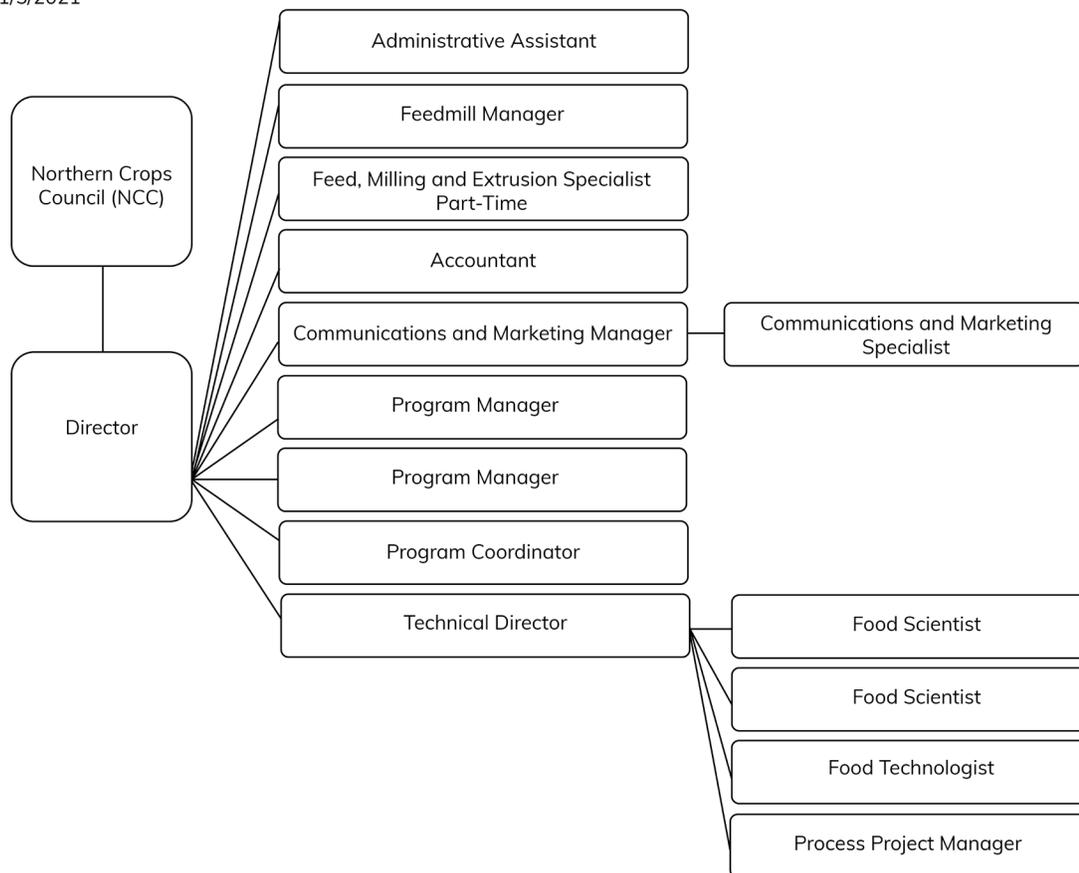
1. In-plant consultations regarding crop quality problems, product manufacturing, and possible purchasing methods and standards.
2. Short courses in product milling and processing, plant management, county elevator management, grain grading, and marketing of crops.
3. Educational and career and technical education training programs in milling, processing, manufacturing, purchasing methods, marketing procedures, product sales techniques, and other related subjects to be conducted for users of northern crops.
4. Short-term investigations, consultation, evaluation, and research to solve technical problems involved in the maintenance of quality and utilization of northern crops.
5. Annual surveys and quality analyses of new northern crops and monitoring of the quality and condition of commodities in market channels.
6. Research on northern crop damage problems and solutions.
7. Identification of problem areas in marketing northern crops abroad.
8. Preparation of instructional, informational, and reference publications on the end use, technical aspects of marketing, and utilization of northern crops for distribution domestically and abroad.

Purpose and Structure

NCI is a small agency with four distinct areas that work collaboratively to fulfill the mission of expanding markets for crops grown in the region.

1. Programs – Focus on the educational aspect of the mission
2. Technical Team – Focus on both technical services, but also the technical aspects of our courses.
3. Communications – Focus on communications and marketing of courses, technical services, and any other outreach that is needed.
4. Administration – Provide guidance, financial overview, and administrative help

An organizational chart for the NCI can be found on the next page.



FINANCIAL AUDIT FINDINGS

The State Auditor's office audited the Northern Crops Institute and did not identify any areas of concern.

CURRENT BIENNIUM MAJOR ACCOMPLISHMENTS & CHALLENGES

Agency Major Accomplishments

1. NCI completed its first ever value survey. Prime46, and external market research company was engaged to provide an independent assessment of the effectiveness and areas of improvement for Northern Crop Institutes programs and technical services. Generally, NCI does two types of courses – industry support (food safety, feed safety, farmer education on markets) and market development courses (procurement, quality, product development). From a technical service standpoint, NCI does work in the context of product development work for education which is usually funded via grants, but also through work with individual companies. The focus of the survey was on the market development courses and work with businesses and those that attended courses in 2018 and 2019 as we wanted some distant from the course to see the change in behavior. Some interesting results and findings:

- *95% of course participants said as a result of the course at NCI, they have a greater confidence in US supply chain.*
 - *99% of course participants said as a result of the course at NCI, they have a better understanding of US crop quality.*
 - *51% of course participants said as a result of the course at NCI, they increased the volume purchased of US Commodities.*
 - *As a result of the course, the average utilization of all crops has gone up for wheat, soybeans, corn, and pulses.*
 - *As a result of our tech services, our clients report a strong increase in use of sunflowers, oats, wheat, soybeans, and pulse crops.*
 - *Our technical service clients reported that as a result of their experience at NCI, their average investment in the region has increased 16.67%.*
2. The biennium was a tale of two very different years in terms of short courses. 2019 was marked by a record number of short courses (twenty) and participants (274) from 37 different countries. In addition, there were a record number of trade teams, which resulted in a record number of visitors. With the pandemic, 2020 was a year for the staff to pivot. NCI hosted one person course and five online courses with 217 participants from 29 countries. In total, NCI hosted 491 course participants in both in person and online formats.
 3. The format and procedure for evaluating courses has been completely revised in 2020 to more accurately reflect the impact that our courses are having for the industry and to allow us to adjust, especially as we transitioned to an online platform. Our 2020 procurement course was the first roll out of this evaluation process. 65% of the course participants reported low confidence in procuring grains before the course, the post course analysis reported 97% increased their understanding of buying grains from the US, 87% increased confidence in buying from the US, and 97% increased their understanding of risk management tools. 90% said the course met or exceeded their expectations and 97% said they would recommend the course.
 4. Our NCI Commodity Grain Procurement course is a perfect example of how NCI staff converted a long effective in person course to an online delivery. There were 36 unique prerecorded presentations and tours which allowed participants from all time zones to view at times that worked in their schedules. This was augmented by daily live question and answer sessions which were also recorded. The feedback from the course, the content, and delivery has been extremely positive.
 5. In May 2020, NCI hosted its first webinar. Since then, we've hosted 12 webinars with over 1200 participants from 51 countries. One of the webinar series will be an ongoing look at the markets for past participants in our procurement courses featuring experts in the markets and other related topics. It is a way to build that relationship back to the US, expand the knowledge of past participants, as well as trial speakers as we work to build out our courses. More
 6. The "Fullfat Soybean Meal Feeding Handbook" is the first handbook that NCI has published focusing on small scale producers that have access to extruders. Globally, fullfat soybean meal feeding is an important component in feeding. The handbook was done thanks to the efforts of North Dakota and Minnesota Soybean farmers and focused on nutritional aspects related to feeding fullfat soybean meal to hogs, ruminants, poultry, and aquaculture. There was also a webinar series that was available with the handbook that included the nutritional experts, as well as processing and formulation experts. Work is already underway for the next several handbooks to be released in 2020 and 2021.

7. NCI continued its work in human and animal food safety conducting on three courses domestically in 2019 and 2020.
8. NCI continued its work in conjunction with US Grains Council in their efforts growing feed demand in Africa. NCI hosted two train the trainer events the US Grains Councils Center for Feed Manufacturing in Tunis, Tunisia.
9. NCI presented at the International Soyfood Processing Technology and Equipment Exhibition in Changsha, China; The US Soybean Export Council Soy Food Workshop in Nanjing, China, and toured several soy food companies in Jiangxi, China.
10. NCI purchased two major pieces of equipment in the biennium. A new stone mill is on order and is set to be delivered in early 2021 with support from the North Dakota Wheat Commission. With more focus on small scale processing and niche baking, the stone mill is a nice complement to our existing equipment. In addition, NCI purchased a vegetable oil deodorizing unit. The equipment was bought used, but still in the original crate at a small fraction of a new unit. This piece will be critical to help the expanding oilseed industry in the future.
11. NCI Continues to work overseas on behalf of the regions farmers. NCI traveled to Cambodia to teach Technical Training for Risk Management with the World Initiative for Soy in Human Health. Brian Sorenson, Program Manager, assisted US Wheat with their 2019 Crop Quality Tour.
12. NCI is on track to assist a record number of clients in this biennium. In the last five years, we've assisted 127 unique customers. Clients range from small start-ups to major companies that have significant investments in North Dakota.
13. The NCI communications team have assisted at a wide variety of industry events in a technical service and support capacity, from assisting with annual meetings and conferences ranging from the annual spring wheat tour to the Prairie Grains Conference.

Agency Challenges

1. NCI's value survey did surfaced customers view that our facilities have some serious limitations, some of the comments include:
 - *"I had the chance to see all this lab renovation and everything. And I think that's the end of what they can do in terms of older places.... There are so many limitations because of the ceiling size, because of the building."*
 - *"Lab space, new space, staffing and investment....The main weaknesses that you can turn down the opportunities and reduce the chances with space with new people, new space."*
 - *"The space, without the space, you can't do more than this."*
 - *Overall comments about how the industry is changing and there is need for new equipment – but lack of space to install.*
2. Changing Trends: NCI continually looks at trends, changes, and challenges in the food and feed industry, as well as in crop production and we are constantly looking for opportunities to assist in developing markets and assisting organizations. That said, there is equipment needs and challenges that arise that are not feasible in our budget, nor the space to put them. A few examples:
 - Extrusion – NCI lacks a simple single screw extruder which is common in most food and feed

- applications. As the developing world demand for healthy snack foods and aquaculture, the need for a single screw extruder limits how we can assist the industry to grow.
- Oilseed Refining – NCI has formed a mutually beneficial relationship with NDSU in oilseed processing. With the advent of gene editing, the ability for the industry to develop niche market oilseeds has significantly expanded. Some estimates put the number of specialty soybeans in product development alone at over 40 new varieties. NDSU has hexane extraction capabilities, NCI has ability to deodorize the oil, however the middle step of oil refining is a key missing piece that is limiting our capabilities to help the industry develop.
 - Protein isolation is a key component of the pulse and soybean industry and a growing importance in the cereal sector as more focus is being spent in extracting protein. North Dakota and the other states NCI serves, has the potential to be a leader in this area, NCI lacks much of the equipment needed (pin mills, sorters, fractionation, spray dryers, etc) to effectively help this industry grow.
3. Training Space: NCI has the benefit of having an excellent auditorium, however, since NCI was developed, the ideas and concepts of what are needed for adult educational experiences has changed as well. For a growing number of NCI programs, there is a need for breakout space to allow for small group learning and discovery.

NEXT BIENNIUM GOALS & PLANS

1. In July 2019, the Northern Crops Council finalized the NCI strategy document outlining the growth plans for NCI. To that end, NCI is planning for the biennium:
 - Growing short courses with the rationale that the more we educate the industry, the more it drives growth of markets.
 - Developing Seminars, Webinars, and Conferences both domestically and internationally. It is estimated that NCI will continue to grow its webinars to support its mission and long term growth of its courses and technical services. In addition, NCI has been working on developing a number of conferences focused on growing demand for Northern Grown Crops both domestically and internationally.
 - In 2020, NCI released its first handbook (“Fullfat Soybean Meal Feeding Handbook”) and is developing its second (“Ancient Grains and Oilseeds of the Great Plains”). There are an additional 8-10 titles that are in the works to be released in the coming years.
 - NCI made its first step towards measuring impact in 2020 with the value survey. We anticipate that this will continue and further improved each year. In addition to developing a measure of capacity utilization of equipment and facilities.
 - Increase overall awareness of NCI and attract more clients to utilize our services to help grow demand for northern grown crops.
2. For five years, NCI has forecasted the need for growing pilot scale oilseed processing capabilities. In conjunction with existing equipment at NDSU, the project is roughly 2/3 of the way complete. It is NCI’s intent to complete this important initiative to assist the oilseed industry.
3. Continue to assist/lead industry in focus on quality as it relates to the crops grown in this region.

COMPARISON OF 2019-21 APPROPRIATION & ESTIMATED SPENDING

	2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
Total General Fund Appropriation	\$1,943,810	\$1,309,345	\$634,465	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

REQUEST/RECOMMENDATION COMPARISON SUMMARY

2021-2023 Needs-Based Budget

Reconciliation of 2019-21 Original General Fund Appropriation to
2021-23 Executive Recommendation

	NCI
General Fund:	
2019-21 Original General Fund Appropriation(5/31/20 Approp.)	\$ 1,943,810
5%/10%/15% reduction	(97,190)
2019-21 Adjusted GF Appropriation	1,846,620
Executive Recommendation Base Increases (Decreases):	
Compensation package salary/benefit increase and health insurance increases	48,433
2021-23 Recommended Base General Fund Increases(Decreases)	48,433
2021-23 Total Executive Recommendation - General Fund	1,895,053
Increase (Decrease) From 2019-21 Adjusted Appropriation, Less Base Adjustments	\$ 48,433
Full-time equivalent positions 2019-21	9.00
Full-time equivalent positions 2021-23 Executive Recommendation	7.75
Other Funds:	
2019-21 Original Other Fund Appropriation	\$ 1,896,217
Remove Capital Project & One Time funds	-
2021-23 Adjusted Other Fund Appropriation(Base Budget Request)	\$ 1,896,217
Executive Recommendation Base Increases (Decreases):	
Compensation package salary/benefit increase and health insurance increases	28,007
Total Executive Recommendation Increases	28,007
2021-23 Total Executive Recommendation - Other Funds	\$ 1,924,224
Increase (Decrease) From 2019-21 Adjusted Appropriation, Less Base Adjustments	28,007
Full-time equivalent positions 2019-21	3.80
Full-time equivalent positions 2021-23 Executive Recommendation	5.80

FUNDING BREAKDOWN

North Dakota University System
Northern Crops Institute
Major Components of current base level

	638
	Northern Crops Institute
Salaries	\$ 3,050,538
Operating	668,739
Equipment	100,000
Capital Projects	-
Total Budget	<u>\$ 3,819,277</u>
Funding:	
Federal Fund	\$ -
General Fund	1,895,053
Special Fund	<u>1,924,224</u>
Total Funding	<u>\$ 3,819,277</u>

Source: IBARS 2021-23, Governor's Recommendation

CURRENT BIENNIUM ONE-TIME FUNDING ITEMS

No one time funding was requested during the current biennium.

NEXT BIENNIUM ONE-TIME FUNDING ITEMS

No one time funding is being requested during the next biennium.

FUNDING DEPOSITS

NCI collects course fees and charges technical service fees for the services that we render. NCI continually strives to market our services and our courses and aim to maximize the impact of this funding. These funds are reinvested in equipment and at times personnel to run the equipment and assist the industry.

APPROPRIATION BILL ADDITIONS

There is no need for any other sections to be included or are being requested/recommended to be included in the agency appropriation bill.

OTHER BILLS BEING CONSIDERED

There is ongoing discussion of a potential new facility for the Northern Crops Institute.

IMPACT OF BUDGET CHANGES

Part of our mission is to assist in developing markets for new and small scale crops. Many of these groups lack funding to sponsor courses or events. Some of our services to these emerging crops will likely suffer. In addition, a number of grants that NCI applies for will not cover costs of administration or other staff members, so there may be impact on the amount of outside funding that NCI is able to obtain. As a result, there may be a reduction in outside funding due to budget reductions.

LIST OF REQUESTED CHANGES

Restoration of 5%.

OPTIONAL ADJUSTMENT REQUESTS COMPARISON

NCI requested reinstatement of 5% reduction but this request was not included.

CORONAVIRUS (COVID-19) PANDEMIC FUNDING BREAKDOWN

NCI had a total request of \$115,586 that was approved. \$101,015 for technology for conference rooms, labs, and auditoriums to deliver remote learning and meetings. \$13,735 was for equipment for employee teleworking. \$836 was approved for PPE.

Impact Analysis

Northern Crops Institute (NCI) is an effort to support the promotion and market development of crops grown in North Dakota, Minnesota, Montana, and South Dakota. NCI is an international meeting and learning center that brings together customers, commodity traders, technical experts, and processors for discussion, education, and technical services. Situated in Fargo, North Dakota, USA, this unique facility is only minutes from the farm fields that yield much of the world's food.

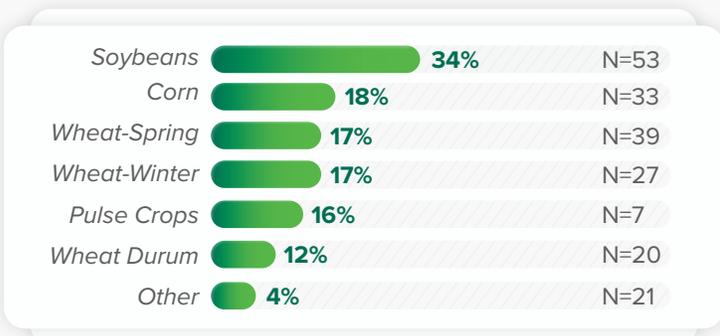
Course Impact

The Northern Crops Institute offers a variety of courses, webinars, and handbooks that unite customers, commodity traders, technical experts, and professors for discussion and education. During our courses, participants can expect to refresh their expertise and be exposed to existing and new technology, participate in lectures, case histories, laboratory demonstrations and tours and hear from industry experts, government officials and university professors.



● - Yes ● - No Survey response from 104 course participants from the 18-19 calendar year

As a result of your experience with NCI, how much has your utilization of the following ingredients net increased over the past 2 years?



Survey response from 102 course participants from the 18-19 calendar year

“

*Definitely we are more... (buying US Wheat as a result of the course). Value is the quality and price combined. So, yeah, definitely, **we think U.S. wheat has a better value compared to Canadian wheat. It's a certain level we can accept the price gap.***

”

Technical Impact

NCI has a technical staff comprised of highly experienced food scientists, processing technologists, and project managers. NCI has the experience and resources to bring your vision to life; from start to finish we partner with clients through the process, creating a concise and clear experience to help scale-up your product development.

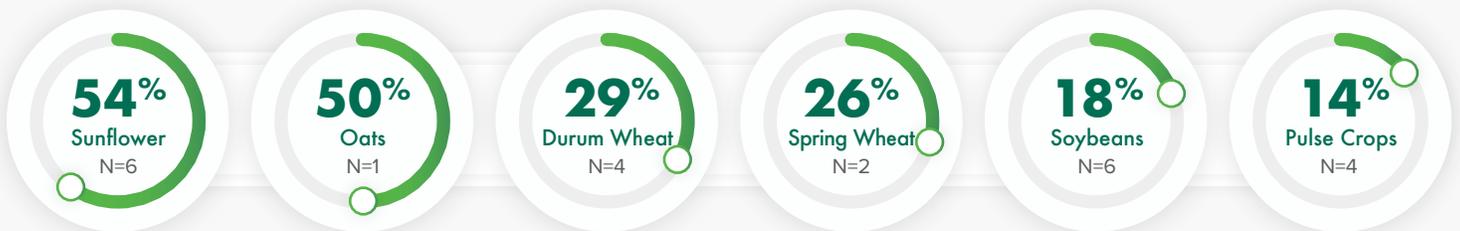
“

Since we started these conversations (with NCI), we have probably gained at least 50% in volume.”

”

– Technical Service Client

As a result of your experience with NCI, how much has your utilization of the following ingredients net increased over the past 2 years?



Survey response from 15 technical service clients from the 18-19 calendar year

Overall Investments

Our research shows that clients have increased their overall investment activity by 16% within ND, MN, MT, and SD after their experience working with NCI.

Survey response from 15 technical service clients from the 18-19 calendar year



Testimonies

“

To be honest, I didn't know what to expect, but it was amazing. First of all, the members groups were great and to see the whole supply chain and where the grains come from the farmers to the trains or through the port and from there to our country, it was pretty amazing to see it. It was an amazing experience. I came back and I was full of energy.

”

“

From the logistics of soy, the cultivation of soy, the production of soy, learning about North Dakota and its role globally. And so, I didn't know some of these things..... And thereafter, I began to see many references on North Dakota soy and the quality of the soy coming from there, and what makes North Dakota soy the special soy product that it is, climatic conditions and everything.

”

Survey conducted by Prime46

CONNECTING IN THE GLOBAL MARKETPLACE

Northern Crops Institute

2020 ANNUAL UPDATE

The 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.





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DIRECTOR'S REPORT



Mark Jirik
Director

The Northern Crops Institute was originally born in a time of crisis. The founders of NCI were facing an agricultural and economic crisis that was wracking the region and the country when the conversations started about having a center to grow markets and expand value added processing for the region. Our founders knew that the future lay in adapting and changing. I would hope that as the world is in the grips of a global pandemic, and NCI enters its 40th year of existence, our founders would be satisfied with how NCI has changed and adapted, especially over the last year.

In November, someone made a comment that the prior seven months had forced ten years worth of change on the industry. That was certainly true for NCI. Through the tragedy of the global pandemic, we still need to focus on fulfilling our mission of growing markets for our region. Historically, NCI has done that in two ways – our technical services (including product development work and quality testing and monitoring) and our programs (which historically focused on in person courses).

The NCI staff did a tremendous job of pivoting. Changing how we interact with our technical service clients. Converting our courses to online delivery. Developing a host of webinars. Releasing our first technical handbook. Assisting our industry partners as they moved their events online. These are just a sample of the innovative ways that NCI has strived to live up our founder's vision.

NCI also completed our first value analysis – focusing on the impact our courses and tech services from 2018 and 2019 had on our clients and program attendees. The results, highlighted later in this report, give numbers and facts to what those involved have always known – NCI has, and continues, to have an impact on the region, increasing exports and value added activity for the region.

NCC CHAIR'S REPORT



Tregg Cronin
NCC Chair

2020 was an unprecedented year for many amid the global pandemic, the Northern Crops Institute included. For an organization which has traditionally relied on face-to-face meetings, conferences and seminars, drastic changes were needed to maintain relationships and build business. Under the careful guidance of director Mark Jirik, NCI was able to navigate these challenges in impressive fashion by utilizing technology to bridge the gap until some sense of normalcy can return. Participation in several courses were multiples larger than previous years which were only featured in-person, presenting an opportunity for future courses.

All of the Northern Crops Council meetings were held virtually in 2020 as the four member states worked through the various state protocols related to travel and in-person meetings. We are hopeful with the arrival of the

coronavirus vaccine, in-person board meetings will be a possibility at some point in 2021.

If there was one big takeaway amid the chaos that was 2020, it was the work of producing and promoting the regional agriculture in the four state area goes on. Organizations possessing flexibility and adaptability thrived in 2020. The Northern Crops Institute was one of those organizations. We look forward to a brighter future in 2021 and thank you for your steadfast support of the NCI.



LEADERSHIP AND LEARNING ARE INDISPENSABLE TO EACH OTHER.

- John F. Kennedy

2020 NORTHERN CROPS COUNCIL (NCC)

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. It's members consist of:

Tregg Cronin, Chair | SD Wheat Commission

Jim Bahm | ND Wheat Commission

Adam Carney | MT Wheat & Barley Committee

Tim Dufault | MN Wheat Research & Promotion Council

Kris Folland | MN Soybean Research & Promotion Council

Doug Goehring | ND Department of Agriculture

Kevin Haas | Northern Pulse Growers Association

Jiwon Kim | ND Trade Office

Greg Lardy | North Dakota State University

Peter Matthaei | Dakota Specialty Milling

Tony Schneider | ND Barley Council

Todd Sinner | SB&B Foods, Inc.

John Swanson | MN Corn Research & Promotion Council

Vance Taylor | North Dakota Mill

Dan Spiekermeier | ND Soybean Council

Bruce Speich | ND Oilseed Council

Chris Wiegert | Healthy Food Ingredients



MARK SANDBORN

"Anyone, anywhere, can make a positive difference."



NCI THANKS OUTGOING NCC MEMBERS FOR THEIR SERVICE

We would like to thank to following outgoing council members for their years of service:

1

MARK MARTINSON

Mark Martinson (Rolette, ND) represented the U.S. Durum Growers Association and served as Vice Chair.

2

ANTHONY CHAVEZ

Anthony Chavez (Plymouth, MN) represented Buhler Inc..

3

JUSTIN HALVORSON

Justin Halvorson (Sheldon, ND) represented the North Dakota Corn Growers Association.

4

DAVE KATZKE

Dave Katzke (Plymouth, MN) represented General Mills.

5

BEN VIG

Ben Vig (Sharon, ND) represented the ND Oilseed Council.

EDUCATIONAL COURSES



NCI has a strong reputation for providing short courses and other programs that educate global buyers and processors of the crops grown in North Dakota and the Northern Plains. When the COVID-19 Pandemic hit in March of 2020, NCI had just completed two in-person programs with additional courses on the schedule throughout the year. As with everyone in industry and academia, NCI adapted to deal with the changes that came with the pandemic.

The annual Pasta Production and Technology Course was converted to a live-stream, online format and conducted on schedule from April 28-30 with excellent reviews from the participants. NCI's long-standing flagship course, Grain Procurement Management for Importers, had been offered in-person since 1983, but was converted to an online format with 94 participants from 19 countries. Moving this course to online required countless hours to film lectures and tours of farms and elevators, as well as coordinate the daily live-streamed Q&A sessions to connect the international participants with experts from NDSU and industry. NCI Pelleting Technology Online is a new course that was conducted November 3-5 with over 70 participants registered from seven countries. Some courses that require hands-on laboratory training were postponed and later cancelled as the pandemic continued.

For 2021, NCI is planning online courses throughout the year, and hoping to return to in-person courses by August or September. The online courses are allowing us to expand our reach to participants who may not have the opportunity to travel to the U.S.A., even after we have moved past the COVID-19 pandemic.



NCI HOLDS FIRST ONLINE COURSE

This year, the Northern Crops Institute (NCI) held their first online course. The three-day Pasta Production and Technology course ran from April 28th-30th, 2020. This course has typically been an in-person course but given the situation, NCI staff worked to bring the hands-on experience to an online platform. Participants were introduced to the fundamental and applied aspects of pasta production and quality. The course primarily focused on traditional dry durum-based pasta, but also included lectures on using alternative ingredients, and working with refrigerated and frozen pastas. Participants also learned about pasta industry trends, die maintenance and design, and the impact that processing variables has on the quality of the final product.

2021 COURSE SCHEDULE

* Subject to change. TBD = to be determined.

1 **HEALTHY SOLUTIONS FOR FOOD BARLEY USES (ONLINE)**
January 26-February 4

2 **SCHOOL OF WHEAT QUALITY (ONLINE, CLOSED COURSE)**
February 22-April 9

3 **BARLEY TO BEER**
April TBD

4 **RISK MANAGEMENT FOR CONTAINER SOYBEAN & SBM FOR FEED (ONLINE, CLOSED COURSE)**
April TBD

5 **PASTA PRODUCTION AND TECHNOLOGY (ONLINE)**
April 27-29

6 **SCHOOL OF WHEAT QUALITY (ONLINE, CLOSED COURSE - REPEATED)**
May 24-July 2

7 **UNDERSTANDING VEGETABLE OILS - QUALITY & UTILIZATION (ONLINE)**
June 15-17

8 **GRAIN INDUSTRY EMERGING LEADER PROGRAM PART 2: MANAGEMENT VS. LEADERSHIP**
July TBD

9 **DURUM FOODS**
July TBD

10 **NCI-INTSOY**
August TBD

11 **HEMP UTILIZATION**
August 31-September 2

12 **GRAIN PROCUREMENT MANAGEMENT FOR IMPORTERS (FORMAT TBD)**
September 13-22

13 **BARLEY & MALT QUALITY**
September 27-30

14 **FOOD-GRADE SOYBEAN PROCUREMENT (FORMAT TBD)**
October 4-7

15 **ETHANOL PROCUREMENT FOR IMPORTERS (IN-PERSON)**
October 11-17

16 **PLANT-BASED TEXTURIZED PROTEIN PRODUCTS (FORMAT TBD)**
October 18-22

17 **PELLETING TECHNOLOGY (ONLINE)**
November 2-4

18 **GRAIN INDUSTRY EMERGING LEADER PROGRAM PART 1: MERCHANDISING TO LEADERSHIP**
December 14-16

WEBINARS



NCI webinars have shown to be a powerful tools in developing markets, connecting people, and sharing ideas to grow markets for crops grown in the region. The webinars have allowed us to reach audiences and share messages that we would not be able to in an in person course. It eliminates the need for travel, and allows us to plant seeds of innovation in the region and globally.

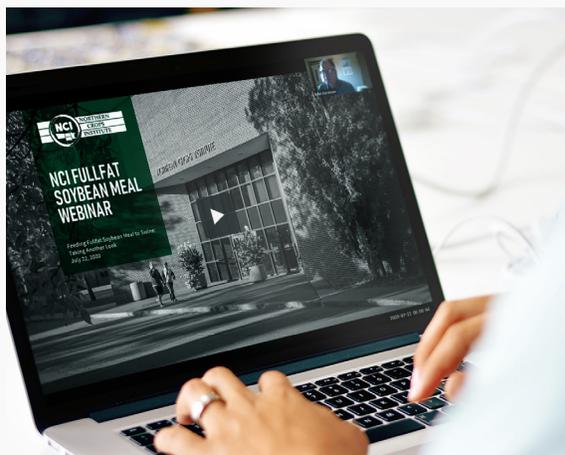
When NCI rolled out its first handbook, “Fullfat Soybean Meal Feeding” in May, the idea of having an in course was out of the question, so a series of webinars was the natural next step and the format of the book and material (Swine, Poultry, Ruminant, Aquaculture).

Then the question was asked, how can we use this technology to keep in contact with our past course participants and to continue showing the value of US crops and updating people and what is happening with US Markets. In July, our “NCI Market Update” webinars were released – a monthly catchup with different market experts open to any of our past procurement course participants.

NCI’s focus on value added process and building domestic markets has also been a challenge as much of that content didn’t lend itself to short courses. So a new webinar was born focused on value added agriculture coping with challenging times.

The results have been impressive with 13 webinars in 2020 hosting over 1,200 participants.

2021 will see the “NCI Market Updates” continue and in January, we will be rolling out a new monthly webinar series, “Cereal Innovators” focusing on unique and innovative uses for cereal crops grown in our region and developing a new series called, “The Future of Feeding” looking at livestock development and feeding innovations. Additional webinars series are also in development.



NCI LAUNCHES FULLFAT SOYBEAN MEAL WEBINAR SERIES

The Northern Crops Institute (NCI) held the first installment of its four-part Fullfat Soybean Meal Webinar series titled “Feeding Fullfat Soybean Meal to Swine” on July 22nd, 2020. 180 attendees participated in the live webinar, which brought together people from around the globe to discuss the nuances and implications of feeding fullfat soybean meal to swine. The webinar also provided attendees the opportunity to learn from industry experts as well as the authors of the Northern Crops Institute Fullfat Soybean Meal Handbook. When asked what their thoughts were on the webinar, one participant stated “it was an outstanding and informative webinar”. Another mentioned “for me it was very very useful.”

HANDBOOKS



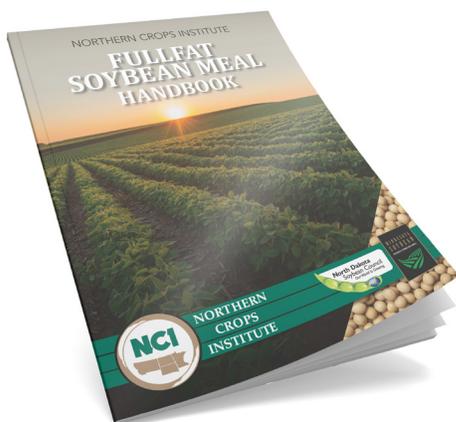
FULLFAT SOYBEAN MEAL HANDBOOK (2020)

In July of 2020, The Northern Crops Institute released the Fullfat Soybean Meal Handbook. The 80-page handbook informs the reader about the processing and feeding of fullfat soybean meal to the major animal groups. Fullfat soybean meal is an excellent source of nutrients and energy, and its value in feed formulations can vary greatly depending on the local costs and availability of commercial soybean meal, non-soy protein products, fat and other ingredients. For some markets, fullfat soybean meal contributes to food security programs in cases of market disruptions. This handbook introduces the reader to the production and feeding of fullfat soybean meal, as a first step in determining if it has potential in their operation – both nutritionally and economically. Each person who receives a handbook also received access to attend four webinars on the feeding of fullfat soybean meal to Swine, Poultry, Ruminants and Aquaculture.

ANCIENT GRAINS HANDBOOK (2021)

Consumers are rapidly becoming familiar with a category of foods known as Ancient Grains and Seeds. Although there is not an official definition of Ancient Grains and Seeds, the category is commonly understood as those grains and seeds that can trace their origins to the earliest times of human utilization and consumption.

The consuming public has been increasingly exploring and purchasing more plant-based foods. In addition, consumers are seeking minimally processed foods with simple, understandable labeled ingredients. Consumers have identified Ancient Grains and Seeds as simple, clean label, back-to-nature foods that are becoming favorite food choices within our health-conscious society. With this in mind, the Northern Crops Institute will be producing an “Ancient Grains and Seeds from the Great Plains” handbook in 2021. The handbook will provide an overview of Ancient Grains and Seeds for the value chain that includes farmers, elevators, millers, food manufacturers and consumers to increase production and consumption of Ancient Grains and Seeds.



FULLFAT SOYBEAN MEAL WEBINAR STATISTICS

- Feeding Fullfat Soybean Meal to Swine | July 22nd:
-180 live attendees, 64 viewed recording
- Feeding Fullfat Soybean Meal to Poultry | August 19th:
-125 live attendees, 77 viewed recording
- Feeding Fullfat Soybean Meal to Ruminants | September 9th:
-98 live attendees, 25 viewed recording
- Feeding Fullfat Soybean Meal to Aquaculture | November 18th:
-65 live attendees, 25 viewed recording

CONNECTING IN THE GLOBAL MARKETPLACE

The Northern Crops Institute is an international meeting and learning center that unites customers, commodity traders, technical experts, and professors for discussion and education.

The Northern Crops Institute is a globally recognized facility. In the past year, we had the privilege of educating 1,026 live participants and 424 non-live participants from 55 different countries through our courses, webinars and recordings of both. It is through these avenues that we work to expand and maintain domestic and international markets for northern-grown crops.

During last years courses and webinars, participants had the opportunity to virtually tour farms and facilities, engage in virtual demonstrations, attend a variety of lectures from university professors and technical experts in the industry and much more.

At the Northern Crops Institute, we believe that crops grown in the northern-tier of the U.S. are valued by perceptive worldwide customers and will stand the test of quality against competitors. We also believe that adapting to new trends and technologies is necessary to remaining vital to the agricultural industry. This years record participation showed us that we can persevere through anything, and allowed us to truly connect in the global marketplace.



COURSE PARTICIPANT

“And I must say, our understanding was almost transcendental, if I could call it, it was really amazing. It was another level. I would advise anybody who was looking to work with this kind of technology to participate in this course.”



DID YOU KNOW? 19% of the course participants surveyed who attended a course between 2018-2019 had the role of CEO, GM, COO or Manager withing their organization.

1,026

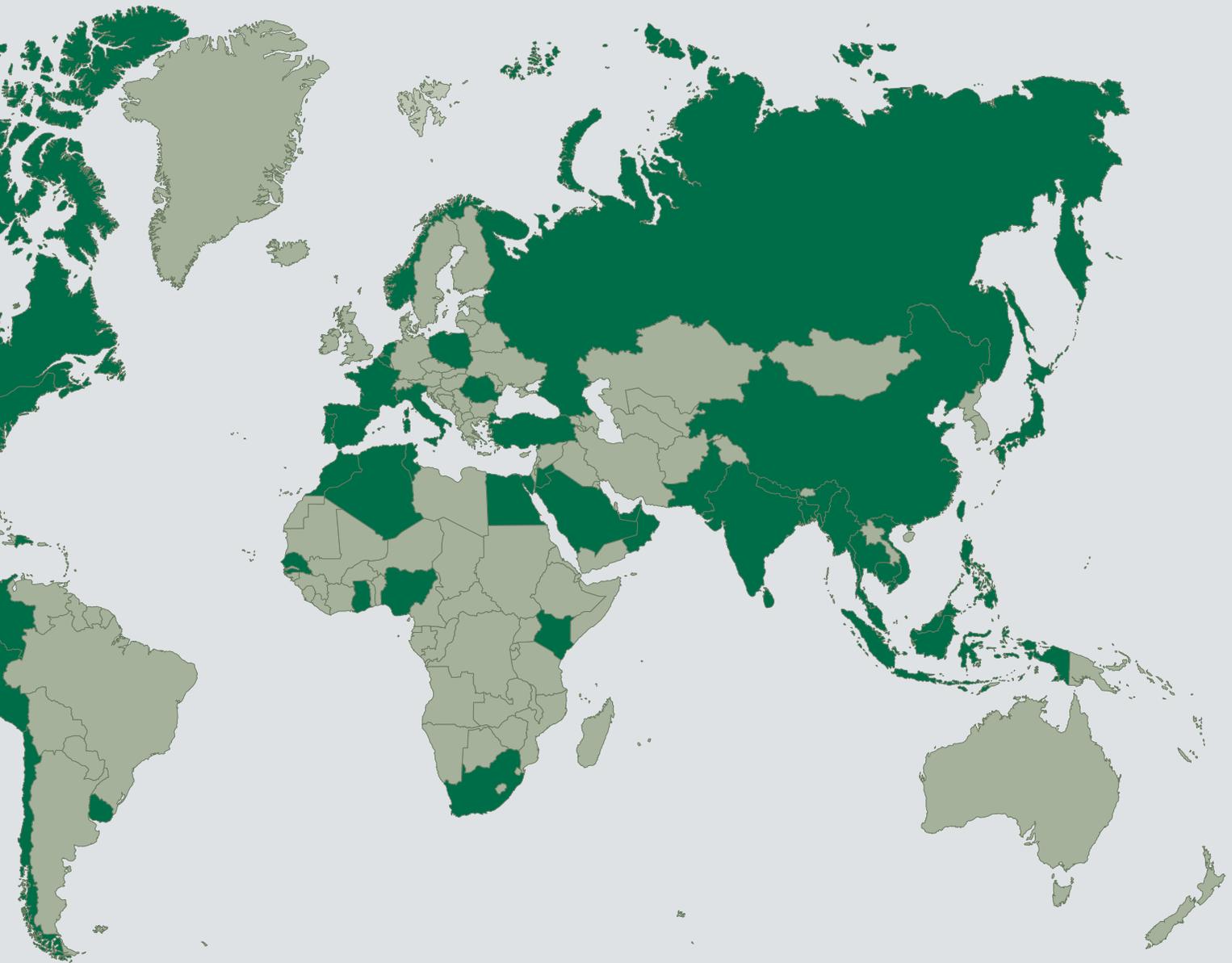
LIVE PARTICIPANTS

and 424 non-live participants from

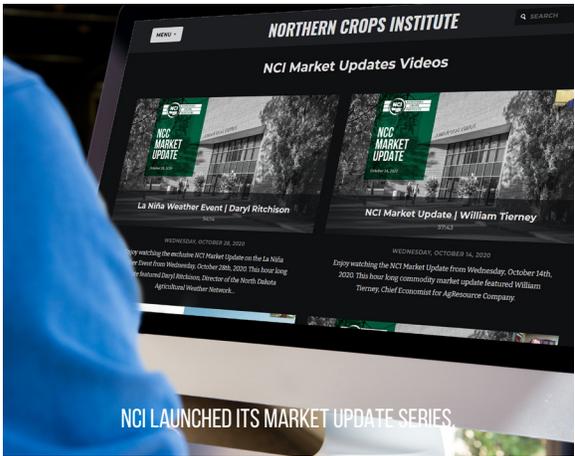
55

COUNTRIES

attended or watched the recording of an educational course or webinar hosted by the NCI in 2020.



■ NCI's global reach in 2020 denoted by the countries participants were from.



NCI LAUNCHED ITS MARKET UPDATE SERIES.



NCI ASSISTED MANY INDUSTRY GROUPS BEHIND THE SCENES WITH ITS TECHNOLOGY.



NCI HELPED HOST A VARIETY OF CONFERENCES AND WEBINARS FOR INDUSTRY GROUPS.

COMMUNICATION

NCI COMMUNICATION TEAM ADAPTS AND ACCELERATES THROUGH CHALLENGING YEAR

In a normal year, NCI would be hosting courses and trade teams with buyers from around the world, highlighting the value of the crops grown in the region. The pandemic turned 2020 into a very different year.

It showed us that we can be agile and adapt to any of the circumstances thrown our way. It also helped us learn and grow. One of the biggest challenges this past year was figuring out how to best educate the global marketplace via avenues that were not in-person. With that in mind, the communications team worked with our program managers to develop and deliver courses through a variety of online virtual formats, each that best fit the particular course. To convey our message virtually, we ended up developing a variety of pre-recorded video demonstrations that were used during each of the courses to show our processing technology and lab testing equipment. We also developed virtual farm and plant tour videos to be used during the courses.

Additionally, NCI has started a series of online market updates for overseas buyers, allowing them to visit with experts on the latest market conditions and help them make good buying decisions and grow the relationship back to the U.S. Each of the webinars was recorded and participants that couldn't attend live were able to view them online. This was the first year the NCI has dabbled into webinars and based on the response we have gotten see a need form more of them in the future.

While this year has been a challenge, NCI has been able to adapt and overcome. We have learned new skills which have allowed us to help other organizations transition their programs or conferences online. We've stepped up behind the scenes with technology, assisting with the following groups with webinars, conferences and video work:

- Minnesota Association of Wheat Growers
- North Dakota Agricultural Association
- North Dakota Grain Growers Association
- North Dakota Wheat Commission
- Northern Plains Sustainable Ag
- U.S. Durum Growers Association
- And more!

Now that 2020 is past us, we look forward to what 2021 has to offer. We are excited for the work we will be doing and look to become a resource to the industry. We encourage you to reach out to us with any questions, and are more than happy to help!

A video library of our webinar and course recordings can be found at: <https://northern-crops.vids.io/>

NCI EXPANDS TECHNICAL SERVICE CAPABILITIES

The Northern Crops Institute is equipped with a variety of analytical and technical equipment used to process, develop and evaluate northern-grown crops. This year we added to our capabilities.

NCI is excited to add additional services to our capabilities. This year, we added an Armfield Deodorizing unit to complement the solvent extraction system that we can use for a variety of oilseeds, including soybeans, sunflower, and canola. So in addition to creating defatted meal, we can more efficiently produce a refined vegetable oil for our clients. A 26" stone mill by New American Stone Mills will give NCI the ability to mill various hard wheats and ancient grains to be used in breads, tortillas, snacks and other products. The demand for both of these processes has increased, so not only does this help our client services, but also gives us the opportunity for strengthening short courses, webinars and other educational materials.



ARMFIELD DEODORIZING UNIT



NEW AMERICAN STONE MILL

NCI RECEIVES CARES ACT FUNDING

NCI took advantage of Federal CARES Act Funding for technology upgrades, allowing state agencies to improve communication and educational services. We were able to secure funding for upgrades to our auditoriums and meeting rooms at the main site and feed production center. Equipment for these rooms included multiple fixed cameras, in-ceiling microphones, speakers, and control panels. We also received portable video cameras, teleprompters, backdrop screens, and created a full video and audio recording studio. These systems will allow us to better reach our audience, our tech clients, and support our industry partners. An example is a portable AV cart that can be used to connect directly to clients during processing with a remote-controlled boom camera and TV display. We can bring people right into our lab! Funds were also used to insure adequate work-from-home capabilities to NCI employees to improve staff communication. A special thanks to the NDSU Ag Affairs and Ag Budget office for their support.



PORTABLE AV CART



**NEED TO TEST AN INGREDIENT OR GET
ASSISTANCE WITH PRODUCT OR PROCESS
DEVELOPMENT?**

We're here for you.



**TECHNICAL SERVICE
CLIENT**

“Since we started these conversations (with NCI),
we have probably gained at least 50% in volume.”

PROCESSING AND PRODUCT DEVELOPMENT

If you need to test an ingredient or get assistance with product or process development, then pilot-scale processing at the Northern Crops Institute might be your solution.

WE'RE HERE FOR YOU.

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

WE'VE GOT EXPERIENCE.

Our technical staff has experience in a wide variety of crops and food production including milling, pasta production, baking, soyfoods, oilseed extraction, and extruded foods. We can make a variety of baked products, tortillas, breakfast cereals, long and short-good pasta, snack foods, soy milk and tofu, and texturized vegetable protein and meat analogs. NCI also manages a livestock feed production center with full-fat extrusion and pelleting available. Additionally, we can assist with analytical and testing services and staff will travel worldwide to assist in the uses of northern-grown crops.

WHAT WE OFFER.

We offer cost effective service fees, confidentiality, complete services including purchase of ingredients (specialty ingredients are supplied by client - other ingredients provided at cost) and laboratory for proprietary use (upon approval).

TO LEARN MORE OR CONTACT US WITH QUESTIONS, VISIT:

WWW.NORTHERN-CROPS.COM/PRODUCTDEVELOPMENT

OUR TEAM

We're here to assist you.



TECHNICAL TEAM

David Boehm | Technical Director
Kim Koch, Ph.D. | Senior Feed, Milling and Extrusion Specialist
Neil C. Doty, Ph.D. | Business Development Manager
Rilie Morgan | Process Project Manager
Rachel Carlson | Food Scientist
Minwei Xu | Food Scientist
Mary Niehaus | Food Technologist

EDUCATIONAL PROGRAM TEAM

Brian Sorenson | Program Manager
Nick Sinner | Program Manager
Krista Jansem | Program Coordinator

COMMUNICATIONS TEAM

Grant Christian | Communications & Marketing Manager
Dorothy Pihlaja | Communications & Marketing Specialist

ADMINISTRATIVE TEAM

Janel Brooks | Accountant
Lynn Stadum | Administrative Assistant

EXECUTIVE TEAM

Mark Jirik | Director

FOLLOW US ON SOCIAL MEDIA!



@NorthernCropsInstitute



@NCI_NDSU



Northern Crops Institute



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THANK YOU'S

THANK YOU NORTHERN CROPS INSTITUTE SUPPORTERS

Thank you to all who supported NCI programs and activities in 2020. An additional thanks to our:

2020 AGRIBUSINESS SPONSORS

Arrow K Farms
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Buhler Inc.
Dakota Growers Pasta Co. Inc
David and Susan Katzke
Healthy Food Ingredients
North Dakota Farmers Union
North Dakota Grain Dealers Association
North Dakota Grain Growers Association
North Dakota Soybean Growers Association
North Dakota Trade Office
Northern Canola Growers Association
Northern Pulse Growers Association
ProSeed
Red River Commodities
Richland IFC
Red River Valley Sugarbeet Growers
SB&B Foods
U.S. Durum Growers Association



MARK JIRIK, DIRECTOR

"Thank you to all who supported the Northern Crops Institute last year. Your generosity allows us to expand and maintain domestic and international markets for northern-grown crops."



2020 FUNDING PARTNERS

Minnesota Department of Agriculture
Minnesota Soybean Research & Promotion Council
Minnesota Wheat Research & Promotion Council
Montana Wheat & Barley Committee
North Dakota Barley Council
North Dakota Soybean Council
North Dakota State Appropriations
North Dakota Wheat Commission
Northharvest Bean Growers
Northern Pulse Growers Association
South Dakota Department of Agriculture
South Dakota Wheat Commission
Washington Grain Commission



MISSION:

The 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.



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CONNECTING IN THE  **GLOBAL MARKETPLACE**

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