

Northern Crops Institute

Spring Update

2012

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.

Northern Crops Institute Receives NDTO Service to Exporters Award



John Crabtree (left), NCI Assistant Director, accepts the Service to Exporter Award from N.D. Governor Jack Dalrymple (right), who presents it on behalf of the North Dakota Trade Office.

Northern Crops Institute (NCI) received the 2011 Service to Exporters Award at the 2012 Global Business Connections Conference in Fargo, N.D., on April 11. The NDTO Service to Exporters Award is an accolade given to one organization that demonstrates exceptional commitment to supporting North Dakota exporters and increasing the state's international business.



Weber

Mark Weber, NCI Director, says, "Since Northern Crops Institute opened its doors in 1983, we have been blessed with an outstanding staff. In addition, the success of NCI is largely due to the partners we have in the regional commodity groups and university scientific communities. I would like to thank them all for their



Left to right: Crabtree, Linda Briggs, NCI Office Manager, Gov. Jack Dalrymple, and Dean Gorder, NDTO Executive Director, pause for a moment after the award presentation.

outstanding contributions to the Northern Crops Institute."

"NCI has consistently provided opportunities for North Dakota exporters through their significant exposure to buyers and processors around the world," says Dean Gorder, Executive Director of the North Dakota Trade Office. "The North Dakota Trade Office looks forward to continuing and expanding this great relationship," he concludes.

Looking for New-Hire Training or Need a Refresher for Yourself? Register for one of our Technical Courses...

For more information and to register, visit www.northern-crops.com and follow the educational courses link, or call 701-231-7736.

Healthy Solutions for Food Barley Uses July 10-12, 2012

This course provides the fundamental and advanced knowledge of food barley functionality as it applies to food product development utilizing food barley, including hulled and hulless barley exclusively. The participants will experience lectures, hands-on demonstrations of food barley applications, and a tour of a food barley processing plant. In addition, topics will cover the nutritional as well as analytical perspective of food barley that will be useful for individuals working in product development. Cost: \$750. Registration Deadline: June 19.

Science of Gluten-Free Baking August 7-9, 2012

The Science of Gluten-Free Baking Short Course provides participants with fundamental knowledge in gluten-free baking. This course emphasizes the ingredients and techniques that produce baked products with wonderful flavor and texture. The topics will cover an overview of the gluten-free industry; functionality, availability, and nutrition of gluten-free ingredients; as well as, requirements to be a gluten-free facility. Participants will gain hands-on experience in producing gluten-free baked goods and conduct baking tests on various ingredients. Cost: \$750. Registration Deadline: July 17. Important note: *NCI is not a dedicated gluten-free facility.*

Let NCI Design a Customized Short Course for Your Company's Needs...

Northern Crops Institute (NCI) will help your company develop a customized training program to meet your specific needs. Our customized programs provide timely technical information by NCI staff and U.S. experts, offer hands-on experiences to enhance lectures, and provide a retreat or in-service atmosphere and team building opportunities. We do this in a confidential environment, so that your employees can discuss proprietary issues. Contact Northern Crops Institute to arrange a course geared for your particular needs. Phone: 701-231-7736.

Barley Malt Quality Evaluation August 14-17, 2012

This course reviews, through lecture and demonstrations, the quality components of barley and malt necessary to produce an acceptable beer. Course content and laboratory demonstrations are designed to assist malting and brewing staff to round out their knowledge of the importance of various quality traits and various biochemical processes associated with the production of malt and beer. Cost: \$900. Registration Deadline: July 25.

Grain Procurement Management for Importers September 17-26, 2012

This eight-day course focuses on the mechanics of grain merchandising and is designed to educate individuals who are responsible for purchasing grain. Academic and commodity trade authorities lecture on cash and futures markets. Grain merchandisers guide you through the full complexity of the international grain markets. Seminars are presented by grain merchandisers at the Minneapolis Grain Exchange. Participants receive a CD containing an outline of each presentation, copies of the visuals used, and other printed materials for future reference. The class also has on-site visits to a country elevator, an export grain terminal, and a barge facility. Cost: \$1,400. Registration Deadline: August 27.

We specialize in:

- Baking
- Flour and semolina milling
- Pasta processing
- Extrusion technology
- Value-enhanced uses of U.S. northern-grown crops
- Quality analysis of cereal and feed grains
- Grain procurement strategies
- Grain standards and inspection procedures
- Feed milling/manufacturing

Pasta Manufacturing Course Hits Near Record Enrollment

Thirty-six participants from 21 pasta companies in Brazil, Nigeria, South Africa, and USA attended the Pasta Production and Technology Short Course in April.

"We were pleased to host a near record enrollment at the course," says John Crabtree, NCI Assistant Director. Crabtree coordinates the NCI short courses.



Crabtree

"Almost all of the major U.S. companies were represented. This says a lot about what the NCI staff has done with the program over the years. Many companies have sent their people to the course since its beginning in 1984.

"This year, in addition to representatives from the U.S. pasta industry, we hosted pasta companies from Nigeria, Brazil and South Africa.

Nigeria is actually a big consumer of wheat. In 2012, Nigeria was the United States' fourth largest durum wheat customer and their wheat flour milling and pasta industries continue to grow. Eight participants were sponsored by U.S. Wheat Associates," Crabtree says.

Faculty for the course were: Michael Ehr, Buhler, Inc.; Elias Elias, Ph.D., NDSU Durum Breeder; Alexis Freier and Radwan Ibrahim, Ph.D., Dakota Growers Pasta Company; Al Lucia, Axor America; Dan Maldari, D. Maldari & Sons; Frank Manthey, Ph.D., NDSU; Brian Sorenson, Dakota Specialty Milling, Rachel Carlson, Natsuki Fujiwara, Alyssa Hicks, Thunyaporn Jeradechachai, and Rilie Morgan, all NCI.



Jeradechachai explains the operation of the ravioli machine.



Morgan demonstrates extrusion of long goods pasta for the class.



Morgan

Managing Risk is Focus of Advanced Grain Procurement Course

Seventeen grain buyers from Honduras, Italy, Japan, Mexico, Netherlands, Poland, Portugal, Trinidad, and USA attended the Advanced Grain Procurement Strategies Short Course in May. Eleven participants were sponsored by U.S. Wheat Associates.



Participants from Italy, USA, and Japan work on a tendering game during the Advanced Grain Procurement course.



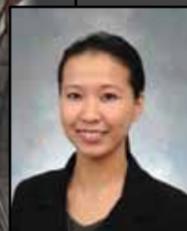
Wilson

The course is designed for global grain buyers who want to gain a competitive edge in grain marketing decisions to better manage price and quality risks. Trading and tendering games, case studies of real world situations, and panel discussions give participants practical experience in applying what they have learned. The group also toured Alton Grain Terminal, Hillsboro, N.D., to learn how their shuttle train facility operates.

"As agriculture continues to evolve around the world, it creates a lot of uncertainty in grain markets. From this course, grain merchandisers learn various price risk management tools that they can use to minimize market volatility," says John Crabtree, NCI Assistant Director.

William Wilson, Ph.D., NDSU Distinguished Professor of Agribusiness and Applied Economics and an expert in commodity futures trading, led the course. Additional speakers included: David Bullock, Ph.D., AgriBank, FCB; Dan Endreson, CHS Inc.; Mike Krueger, The Money Farm; Jim Peterson, North Dakota Wheat Commission; and Nabil Amra, U.S. Bank-Minneapolis.

Jeradechachai Presents Pulse Seminars in Thailand for USADPLC



Jeradechachai

Thunyporn "Naggie" Jeradechachai, NCI Crop Quality Specialist, traveled to Bangkok, Thailand in January where she presented information on the ingredient production, nutrition, and applications of U.S. pulse at the Healthy Cooking with U.S. Pulse Seminar. The seminar was sponsored by the USA Dry Pea and Lentil Council (USADPLC). The seminar included lectures, cooking, and baking demonstrations. Course participants were dietitians, nutritionists, university faculty, school food service personnel, and chefs. This is the first seminar held for the USADPLC in the Thai language.

ND Senate and House Interim Committee on Agriculture Tours NCI

The North Dakota Senate and House Interim Committee on Agriculture were guests at the Northern Crops Institute in April. NCI Director Mark Weber gave them a brief overview of the work done at NCI and then they toured the NCI facility. During their time on NDSU's campus, they also visited the NDSU Agricultural Experiment Station Research Greenhouse, the NDSU Beef Cattle Complex, Waldron and Harris Halls, and the North Dakota State Seed Department.



NCI Director Mark Weber (left) introduces Rachel Carlson (center), NCI Food Technologist, to the delegation. Carlson demonstrates a food product she is baking for a school lunch project.



John Crabtree, NCI Assistant Director, explains the NCI Pasta Extruder and NCI's extensive inventory of dies, which produce different pasta shapes.



Crabtree (right) shows N.D. Senator Curtis Olafson (left), from Edinburg, several extruded food products that were made in the NCI Extrusion Laboratory.



N.D. Senator Oley Larsen (right), Minot, examines the twin-screw extruder that NCI staff use to make extruded snacks, breakfast cereal, and other proprietary products for food companies.

Carlson and Jeradechachai Present and Demonstrate at Pulse Growers Meeting

Rachel Carlson, NCI Food Technologist, and Thunyporn "Naggie" Jeradechachai, NCI Crop Quality Specialist, attended the Northern Pulse Growers Association's annual convention in Minot N.D. in January.



Carlson

Jeradechachai presented a seminar on the utilization of pulse ingredients.

In addition, they made and served pulse fries and pea fiber cookies during the social hour for the convention.



Hicks

Hicks at Kansas Winter Wheat Quality Tour

NCI Milling Specialist Alyssa Hicks took part in the 2012 Hard Winter Wheat Quality tour in May. Nearly 100 participants in 21 vehicles spent three days surveying the wheat fields of Kansas, Colorado, Nebraska, and Oklahoma. The participants measured and calculated the yield potential of 608 wheat fields, observing management practices, disease pressure, and overall condition of the winter wheat crops. In addition to viewing crops, participants were able to meet with local producers, research and extension agents, and to visit the Kansas City Board of Trade for discussion. The final estimate for the 2012 winter wheat crop was reported to be 49.1 bushels per acre, with a group estimate of 403.8 million bushels to be produced in Kansas.

Hicks will also participate in the 2012 Hard Spring Wheat and Durum Quality Tour that winds through Minnesota, North Dakota, and South Dakota in July.

Koch Assists Mexican Feed Manufacturers

Kim Koch, Ph.D., NCI Feed Center Manager, traveled to Mexico in August and December 2011 to encourage the use of U.S. sorghum and corn in animal feed. He gave presentations and led discussions on feed manufacturing technology concerns related to size reduction, pelleting and steam flaking. Koch reports that there were concerns at each site about the current volatility in the marketplace. All have been impacted by depressed sales of feed products and as a result have retreated from maintaining ingredient inventories beyond a 7-10 day's production needs. The feed seminar was attended by about 150 people. The trip was sponsored by the U.S. Grains Council.



Turkmenistan MACI Team Visits in April

An eight-person MACI team from Turkmenistan visited NCI to learn more about the region's wheat production. The group was hosted by Mark Weber, NCI Director, and John Crabtree, NCI Assistant Director.

They met with wheat experts Senay Simsek, (first row center), Ph.D., NDSU Assistant Professor of Plant Sciences, and Frank Manthey, (back row center), Ph.D., NDSU Professor of Plant Sciences. Turkmenistan is located in Central Asia, where it was part of the Soviet Union until 1991.

New Laboratory Equipment Enhances Services

The following equipment has been added at NCI:

- Brabender Extensograph (measures flour quality)
- Brabender Farinograph (tests wheat gluten quality)
- Chopin Alveograph (measures flour quality)
- Chopin Consistograph (tests wheat gluten quality)
- Chopin Rheofermentometer (measures fermentation capability of dough)
- LECO FP 628C Nitrogen Determinator (protein analyzer)
- Omcan FMA (TR50) Italian Commercial Electric Pasta Machine (restaurant sized pasta production)
- Perten Shakematic (used with falling number equipment)
- RMS Roller Grinder (controls size reduction process)
- Rondo Dough Sheeter (sheets doughs to precise thickness)
- Udy Cyclone Sample Mill (lab sample grinder)



Fujiwara

Fujiwara Attends Baking and Barley Products Courses at WMC and AIB

Natsuki Fujiwara, NCI Food Technologist, attended the Barley Fortified Wheat Flour Product Development Short Course in March at the Wheat Marketing Center (WMC), Portland, Ore. This course was sponsored by the U.S. Grains Council and Idaho Barley Commission to focus on the utilization of food barley for Asian markets. Eight R&D personnel from Taiwan, Korea, and Japan participated in the course and learned through hands-on lab experiences about barley utilization in food products. Asian noodles, Asian steamed bread, artisan bread, flat bread, cookies and tortillas were some of the products they made during class.

Fujiwara also attended a baking short course at AIB International in Manhattan, Kan., in March. This course provided both theoretical and technical information on baking various products including tortillas, sweet dough, cakes, and donuts. Twenty participants attended the course to learn more about the basics of baking.

NCI is Part of Field Pea Study on Pellet Manufacturing Efficiency and Durability

Kim Koch, Ph.D., NCI Feed Center Manager, and D. G. Landblom, Dickinson Research Extension Center, conducted a study to test whether manufacturing efficiency and pellet durability could be further improved by adding field peas to the barley malt sprouts (BMS)/distillers dried grains with solubles (DDGS) blend.

The strong binding characteristics of pea starch and protein has significant value to the commercial animal feed manufacturing industry. The nutrient profiles and reasonable costs of by-products from barley malting and corn ethanol production make them attractive feed ingredients for beef producers. However, DDGS pose manufacturing challenges for feed manufacturers.

In the study, three ingredient ratios were tested in which the level of DDGS was held constant at 60% of the blend, while field pea and BMS inclusion varied in a reciprocal relationship from 10.0 to 30.0%. Results show that the incremental increases of field pea and decreases of BMS reduced electrical energy consumption, increased throughput per hour, and increased pellet durability. When measured as Kwh/MT, increasing field pea in the formulation and reducing the amount of BMS, when pelleting DDGS, resulted in an electrical reduction of 2.23 Kwh/MT and a savings of \$.05 per ton of feed.

Comparing the three test formulations, there was only one pellet durability index point between the high pea and high BMS formulations, which indicates that BMS have good pellet binding characteristics when blended with DDGS. Nonetheless, 30.0% field pea inclusion enhanced overall efficiency and reduced the electrical cost of production.

"Some of our success is attributed to the performance ratio of the pellet die that was used (10:1)," says Koch. Remaining work needs to be done using dies with different relief ratios. Cubing dies commonly used in commercial industry have performance ratios of 7:1, which need to be evaluated under the conditions of the current efficiency and durability study.

Improved pellet manufacturing efficiency and pellet quality are attainable when field pea grain is included in BMS-DDGS formulations. The ratio of ingredients is a key criterion to the improved efficiency, although, pellet die relief ratio is of utmost importance as well. Additional research needs to be conducted with both 10:1 and 7:1 performance ratio pellet dies to determine if efficiency differences exist.

This project was partially funded by a grant from the Cool Season Food Legume Special Grant Program, administered by the University of Idaho.



Koch

Minnesota Soybeans Check-off and Grower Groups Meet at NCI



Alyssa Hicks (center), NCI Milling Specialist, explains the newly renovated swing mill during a tour of NCI.



Kim Koch, Ph.D., (center), NCI Feed Center manager, discusses the work done at the NCI Feedmill.

The Minnesota Soybeans check-off and grower groups met at Northern Crops Institute to learn more about the institute and to tour the facilities. After a welcome by NCI Director Mark Weber, NCI staff led tours and explained operations in the Swing Mill, the Extrusion Processing Lab, the Analytical Lab, the Grain Grading Lab, the Pasta Lab, and the Baking Lab. The guests were treated to soy-enhanced bread and cookies in the Baking Lab before they departed for a tour of the NCI Feed Production Center.



Guests from Minnesota Soybean groups sample soy-enhanced bread during their tour of the NCI Baking Laboratory.

FOOD PRODUCT DESIGN
Partner Series
WEBINAR

New Product Opportunities Using One of America's Favorite Flavors

Today's Speaker
Thunyaporn "Naggie" Jeradechachai
Food Scientist, Northern Crops Institute

Thunyaporn, Jeradechachai (Naggie) is a food scientist at the Northern Crops Institute in Fargo, ND. She provides technical solutions to food manufacturers on the quality and utilization of sunflower, flaxseed, canola, peas, lentils, chickpeas, dry edible beans, soybean, and wheat. Naggie travels in the U.S. and internationally to teach seminars and consult with food manufacturers on the value of the U.S. northern grain crops. Her specialties are traditional and gluten free baking, pasta processing, snack, and cereal extrusions.

SUNBUTTER
Sunflower Seed Butter

Jeradechachai Presents Sunbutter Webinar

Thunyaporn (Naggie) Jeradechachai, NCI Crop Quality Specialist, was the presenter for the Food Product Design Webinar in April, where she promoted the use and benefits of sunflower butter and flavor. Jeradechachai discussed the nutritional benefits, allergen issues, food product applications, sensory studies and the new products in the market that contain sunflower butter. The Webinar was sponsored by Red River Commodities, SunButter division.



Carlson and Jeradechachai Don Their Chef's Hats for CIA Pastry Baking Course

Rachel Carlson (right), NCI Food Technologist, and Thunyaporn (Naggie) Jeradechachai (left), NCI Crop Quality Specialist, attended the Café Breakfast Pastries baking short course at the Culinary Institute of America, N.Y., in May. They learned how to make laminated dough products, as well as other breakfast pastries. Rachel and Naggie are looking forward to incorporating what they have learned into the NCI short courses. Chef Hans Welker (center) was the main instructor.



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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

Technical Services:

- Pilot-Scale Processing
- Milling
 - Baking
 - Extrusion
 - Post-extrusion
 - Feed
 - Industrial

NCI can provide:

- Up-to-date Information
- Fully-equipped Labs
- Hands-on Experiences
- Confidential Environment
- Network of Resources

Connecting in the Global Marketplace

NCI Staff

Mark Weber, Director
 John Crabtree, Assistant Director
 Sally Backman, PR/Communications Specialist
 Linda Briggs, Office Manager
 Rachel Carlson, Food Technologist
 Natsuki Fujiwara, Food Technologist
 Alyssa Hicks, Milling Specialist
 Thunyaporn Jeradechachai, Crop Quality Specialist
 Kim Koch, Ph.D., Feed Center Manager
 Pat Limesand, Account Technician
 Rilie Morgan, Processing Specialist
 Technical Director, Position Open

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Update Editor

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