

NC-213

THE U.S. QUALITY GRAINS RESEARCH CONSORTIUM

Marketing and Delivery of Quality Grains and BioProcess Coproducts

NC-213 is a multi-state research project comprised of researchers such as engineers, entomologists, plant pathologists, grain/food scientists and economists from leading U.S. Land Grant universities, USDA-ARS research centers and private industry. This multi-state project provides an opportunity for team members and industry stakeholders to interact and collaborate on addressing specific engineering, scientific and economic issues associated with cereals crops, oilseeds and bioprocessed coproducts.

NC-213 objectives

- To characterize quality and safety attributes of cereals, oilseeds, and their processed products, and to develop related measurement systems.
- To develop efficient operating and management systems that maintain quality, capture value, and preserve food safety in the farm-to-user supply chain.
- To be a multi-institutional framework for the creation of measurable impacts generated by improvements in the supply chain that maintain quality, increase value, and protect food safety/security.

Research community

NC-213 research is conducted by representatives from universities and laboratories including:

- University of Idaho
- University of Illinois
- Purdue University
- Iowa State University
- Kansas State University
- University of Kentucky
- Michigan State University
- Mississippi State University
- University of Missouri
- Montana State University
- University of Nebraska
- North Dakota State University
- The Ohio State University
- Oklahoma State University
- Texas AgriLife Research
- University of Wisconsin
- USDA, ARS, CGAHR, Manhattan, Kansas

NC-213 has a very strong industry influence with representatives from grain handling, marketing, and processing companies, allied service suppliers, and equipment manufacturers. In addition, an Industry Advisory Board provides NC-213 researchers with input on issues influencing global grain industries and help to identify market-based research needs.



AREAS OF RESEARCH

- NC-213 researchers such as engineers, entomologists, plant pathologists, grain/food scientists and economists investigate methods to measure grain quality attributes.
- Technologies and practices to protect grain from insect and fungal pests.
- Processing practices to insure the quality and safety of various food, energy and biobased products.
- Quality management and assurance systems for identity preservation/traceability.
- Yield and quality issues of biofuel and bioproduct industries.





Making an impact

NC-213 researchers and scientists have made impacts such as:

- Development of analytical screening methods for fermentable starch in corn and composition of feed by-products. Both properties are important in **biofuel production** and the development of rapid screening methods through NIR provide decision-making data to biofuel production facilities.
- Determined that Near Infrared Spectroscopy (NIRS) is a rapid nondestructive technique that is **able to measure organic substances in minutes**. Changes in agronomic practices, such as delayed planting or increased N fertility, can have an annual industry impact of \$2–4 million on ethanol, based on compositional changes that drive ethanol yield changes.
- Developed new varieties of corn for **organic systems** that have increased levels of methionine, lysine and cysteine. This program was created to develop a NIRS measurement of amino acids in corn, which in the past has been hampered by the high correlation between the total protein content and the typical amino acid level.
- Quality management, risk analysis, traceability and identity preservation **systems were developed to ensure food protection and security**.
- Discovered that with the adoption of **color image sorting technology**, a low-cost sorting device for wheat could be built using a standard personal computer and color camera. Special programming techniques can be used for a high throughput while keeping cost low. Accuracy is 15–20% higher than traditional sorters.
- Created a system that **measures insect infestation** of wheat kernels using electrical conductance. The system is cost effective and can inspect a 1 kg sample in less than one minute. A partnership was formed with private industry to produce and market commercial versions of the system. The technology is currently being adopted by a major food manufacturing company.

RECOGNIZING EXCELLENCE IN RESEARCH

Since 2011, NC-213 has recognized individuals early in their careers whose work has significantly contributed to improvements in science, innovation, technology implementation, policy formation, and/or education related to quality of cereals and oilseeds from processing to consumption, and who show outstanding promise of continuing those contributions into the future.

Since 1999, NC-213 has recognized individuals or teams that have made superior contributions to science and/or education related to cereals and oilseeds by awarding them The Andersons Cereals and Oilseeds Award of Excellence. Recipients of the award can be associated with a university, private industry, or a state or federal agency. The winner of this award is announced during the annual NC-213 meeting.

NC-213 has and will continue to have a significant impact on improving the efficiency of the U.S. grain industry and capturing value along the cereals, oilseeds, and coproduct value chains.

To learn more about NC-213, visit www.oardc.ohio-state.edu/nc213