

Grain Quality Newsletter

News and Highlights from NC-213: Management of Grain Quality and Security in World Markets.

Volume 28:2

NC-213 The U.S. Quality Grains Research Consortium



Calendar items of interest ...

Upcoming deadlines and events

- NC-213 Annual Meeting 2009: Our next Annual Meeting is tentatively scheduled to take place in February 2009 in Kansas City, Missouri, at the Embassy Suites KCI (Kansas City International Airport). We will be meeting with the Wheat Quality Council and enjoy a joint banquet. More information to follow.
- Andersons Research Grant Program — Team Competition 2008: announced in early June 2008 with a due date for proposals on September 1, 2008. Look for more details on this program along with the announcement of winners!
- Looking ahead, here are projected release dates for the Andersons Research Grant Program:
Regular Competition: June 2009, June 2011
Team Competition: June 2010, June 2012

The Grain Quality Newsletter is published and distributed at no charge to NC-213 (formerly NC-151) participants and supporters of research on "Management of Grain Quality and Security in World Markets."

Send your contributions, comments, suggestions, and subscription requests to:



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The International Grain Quality and Technology Congress was held July 15–18, 2008, in Chicago, Illinois, at the Sheraton Chicago Northwest

The overall goal of the 2008 International Grain Quality and Technology Congress was to provide a global symposium on the technical, scientific and economic opportunities and challenges involved in creating and capturing value in the grain-based food, feed, fiber and fuel supply chains. The specific objectives of this Congress were to present current research-based knowledge and information on industry practice on:

- Characterization of quality attributes and measurement technologies to quantify agronomic, quality and end use traits of cereals, oilseeds and co-products within the food, feed, fiber and bioenergy complex.
- Best management practices, systems and technologies to maintain and assure the identity, purity, integrity, consistency, quality, biosecurity and marketability of cereals, oilseeds and co-products through the supply chains from production through harvest, handling, post-harvest, and processing operations, to final end use.
- Economic assessment of measurement technologies and management practices for creating and capturing value within the food, feed, fiber and bioenergy complex.

There were approximately 100 in attendance. Of this number there were 18 posters exhibited, multiple vendors and 18 countries were represented. In addition, there were 18 NC-213 members registered!

Congress Organizing Committee

Dr. Dirk E. Maier, Conference Co-Organizer and Co-Chair
Professor, Associate Head and Extension Agricultural Engineer
Post-Harvest Education & Research Center
Department of Agricultural & Biological Engineering
Purdue University

Dr. Peter Goldsmith, Conference Co-Organizer and Co-Chair
Executive Director, National Soybean Research Lab
Associate Professor and the Soybean Industry Endowed Associate Professor
of Agricultural Strategy
Department of Agricultural and Consumer Economics
University of Illinois

Dr. Digvir Jayas, Objective 1 Co-Chair
Distinguished Professor and Associate Vice President (Research)
Canada Research Chair in Stored-Grain Ecosystems
University of Manitoba

Dr. Floyd Dowell, Objective 1 Co-Chair
Supervisory Agricultural Engineer
Engineering Research Group
USDA-ARS Grain Marketing and Production Research Center

Dr. Charles Hurburgh, Objective 1 Committee Member
Professor-in-Charge
Iowa Grain Quality Initiative
Department of Agricultural & Biosystems Engineering
Iowa State University

Dr. Peter Coaldrake, Objective 1 Committee Member
Research Director
Pioneer Hi-bred International

Dr. Kurt Rosentrater, Objective 1 Committee Member
Lead Scientist, Agricultural and Bioprocess Engineer
USDA-ARS North Central Agricultural Research Laboratory

Mr. Jan-Åke Persson, Objective 1 Committee Member
Research Director
Foss

Dr. David Jackson, Objective 2 Co-Chair
Professor
Department of Food Science & Technology
University of Nebraska

Dr. Leland McKinney, Objective 2 Co-Chair
Assistant Professor and State Extension Leader
Department of Grain Science & Industry
Kansas State University

Mr. Jim Stitzlein, Objective 2 Committee Member
Grain Quality Coordinator
Consolidated Grain & Barge Company

Mr. Nick Friant, Objective 2 Committee Member
Grain Handling Coordinator
Cargill

Mr. John Sharp, Objective 2 Committee Member
Director
USDA-GIPSA Technical Center

Dr. Mark Casada, Objective 2 Committee Member
Agricultural Engineer
Engineering Research Group
USDA-ARS Grain Marketing and Production Research Center

Dr. Brian Adam, Objective 3 Co-Chair
Professor
Department of Agricultural Economics
Oklahoma State University

Dr. Corinne Alexander, Objective 3 Co-Chair (invited)
Assistant Professor
Department of Agricultural Economics
Purdue University

Mr. Lynn Clarkson, Objective 3 Committee Member
President
Clarkson Grain Company

Mr. John Schillinger, Objective 3 Committee Member
President
Schillinger Seed Company

Dr. Aziz Elbehri, Objective 3 Committee Member
Agricultural Trade Economist
USDA Economic Research Service

Dr. Richard Carew, Objective 3 Committee Member
Economist, Pacific Agri-food Research Centre, British Columbia
Agriculture and Agri-Food Canada

Did you know?

Iowa State researchers demonstrated that NIRS spectra from different models of spectrometers could be mathematically altered so as to allow networks to operate with multiple brands without sacrifice in accuracy.

In addition, these researchers demonstrated that NIRS could measure fatty acids and amino acids in grains, so long as the pool of calibration samples had sufficient genetic diversity as to break the natural correlations of these subunits with their main constituents, oil and protein, respectively. Traceability of bulk materials was demonstrated to a much greater degree of precision than the grain market believed possible. These findings are now being turned into ISO compliant mathematical algorithms for tracking materials and estimating the probability of inclusion of any given source lot.

A support service for analytical methods was created for the benefit of ISU and other public researchers, through the Grain Quality Laboratory, and for the benefit of Iowa companies, through the Extension Value Added Agriculture Program.

Submitted by Dr. Charles R. Hurburgh, Jr., Professor, Agricultural and Biosystems Engineering, Professor in Charge, Iowa Grain Quality Initiative, Iowa State University



News from USDA/ARS Grain Marketing and Production Research Center, Manhattan, KS

New Research Leader On-board ...

Dr. Thomas J. Herald has been appointed the Research Leader for GQSRU at the Grain Marketing and Production Research Center in Manhattan, Kansas. Tom was raised in Michigan and earned B.S., M.S. and Ph.D. degrees in Food Science from Michigan State University. He served as a Peace Corps Volunteer in Swaziland, Southern Africa, and has also worked for Yoplait USA and Kellogg's. He comes to the GQSRU after more than 16 years as a professor at Kansas State University.

NC-213 Participants Share Their Research ...

Assessing Fermentation Quality of Grain Sorghum for Fuel Ethanol Production Using Rapid Visco Analyzer

The use of sorghum as a feedstock for the ethanol industry is increasing. Rapid methods for predicting the fermentation quality of sorghum are needed to enhance the production of ethanol from sorghum. The Rapid Visco Analyzer (RVA) was used to characterize the pasting properties of 68 sorghum grains with a standard 23-min temperature profile and relate these properties to ethanol fermentation. The results showed a strong linear relationship between ethanol yield and final viscosity, as well as setback. Ethanol yield increased as final viscosity decreased. Based on these results, a modified RVA procedure (10 min) was developed to simulate the liquefaction step in dry-grind ethanol production. The modified RVA procedure is applicable not only for characterization of mashing properties, but also for optimization of alpha-amylase doses for starch liquefaction. Thus, the modified RVA method developed in this work is useful for predicting the fermentation properties of sorghum.

Scott Bean, Telephone 785-776-2725, scott.bean@ars.usda.gov

Structure and Functional Properties of Sorghum Starches Differing in Amylose Content

Starch was isolated and studied from a waxy, heterowaxy, and normal sorghum to determine their chemical properties. The properties of starch greatly influence their functionality and nutritional properties and therefore waxy and heterowaxy sorghum starch may have unique functionality. Cooked waxy starch was found to behave like a visco-elastic liquid, which differed from that of cooked normal and heterowaxy starch. Heterowaxy starch was found to have less amylopectin chains with a degree of polymerization in the range of 6-15 than did normal starch. Functionally, heterowaxy starch had a higher gelatinization temperature and contained lower amounts

of rapidly digestible starch and higher levels of resistant starch than waxy starch.

Scott Bean, Telephone 785-776-2725, scott.bean@ars.usda.gov

A Unique Approach to Micronization

Resonance destruction occurs when the vibration of a certain material exceeds its natural resonance frequency, such as when the Tacoma Narrows Bridge failed in 1940. This research reports the use of this resonance destruction phenomenon to process grain. In cooperation with Dr. Jeff Gwartz, KSU, we used a Pulsewave™ Technology machine with a capacity range of 500–8,000 pounds per hour to reduce wheat grain to flour. The Pulsewave™ Technology has the ability to reduce a very high percentage of clean endosperm into flour in a single pass and thus potentially uses significantly less energy than a conventional mill. This technology causes grain to break into fractions differently than a conventional mill, and thus produces flour with different, possibly superior, quality traits.

Floyd Dowell, Telephone 785-776-2753, floyd.dowell@ars.usda.gov

Recent Grants Received by GMPRC Researchers ...

Paul Armstrong

“Development of near infrared measurement methods for single soybean seed composition” awarded by the University of Kentucky.

Floyd Dowell

“Single Kernel Sorting Technology for Enhancing Scab Resistance” awarded by the U.S. Wheat and Barley Scab Initiative and *“Evaluate the use of NIRS for identifying the sibling species of Anopheles gambiae complex”* awarded by the International Atomic Energy Agency.

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Form a Research Team and Compete!

The Andersons Research Grant Program: Team Competition Is Announced

Since the beginning of the NC-151 Committee in 1978, The Andersons' Agricultural Research Fund has provided about \$50,000 per year, which has enabled up to at least five projects to be funded for two-year periods. A large measure of the success of the NC-151/NC-213 Committee over its 25-year existence is due to the research funds made available on a recurring basis by the The Andersons Agricultural Research Fund. In 2000, the “Team Competition” was introduced to foster collaboration between researchers, institutions and industry. Additionally, the goal of the Andersons Research Team Competition is to develop new approaches and technologies to maintain or improve the quality of cereals and oilseeds from harvest to delivery, while preserving the environment and maintaining consumer safety. These approaches and technologies must be developed and implemented if the United States is to remain at the forefront of the world's major producers. This program is focused on facilitating multidisciplinary, multistate and multiagency collaborative research to address critical cereal and oilseed research issues.

Please visit the NC-213 web site for the current RFP with details (complete with guidelines, funding limits and due date).



The Andersons Research Grant Program:
Team Competition

Request for Proposals

Submission Deadline:
September 1, 2008

Photo courtesy of: The Andersons, Inc., Corporate Communications
Location: The Andersons Albion Ethanol LLC - Albion, Michigan

NC-213, Marketing and Delivery of Quality Grains and BioProcess Coproducts 6/1/08

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