

Grain Quality Newsletter

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

Volume 26:2

Visit the NC-213 web site at: <http://www.oardc.ohio-state.edu/nc213>



Calendar items of interest ...

Upcoming deadlines and events

- **NC-213 Annual Meeting 2007**
Our next Annual Meeting will take place on February 21-22, 2007, in Kansas City, Missouri, at the Embassy Suites KCI. We will be meeting with the Wheat Quality Council (their meeting dates are February 20, 21, and 22) and enjoy a joint banquet on the evening of Wednesday, February 21, 2007. More information to follow.
- **Anderson Research Grant Program—Team Competition 2005**
If your first year of research ends soon, don't forget to file an Annual Report with the Administrative Advisor's office to ensure that your second-year funding will be released on time.
- **Anderson Research Grant Program—Regular Competition 2007**
Projected announcement date is June 2007 for a projected due date for RFP of September 1, 2007.
- **Anderson Research Grant Program—Team Competition 2008**
Projected announcement date is June 2008 for a projected due date for RFP on September 1, 2008.

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:



F. William Ravlin
Grain Quality Newsletter
The Ohio State University
OARDC
1680 Madison Avenue
Wooster, OH 44691-4096
e-mail: ravlin.1@osu.edu

In his own words ...

Joe Needham Takes on the Role of NC-213 Liaison

By Joe Needham, The Andersons

I'm impressed. Three months into a new job at The Andersons and an assignment as our company's liaison to NC-213, seeing firsthand the professional work and research results of the consortium is impressive.

Terms like "relevant," "diligent," "creative," and "urgent" all come to mind. The work on mycotoxins, insects, grain storability, and DDGS (distillers dried grain with solubles) handling are all topical in our industry. So if a relatively objective outsider's initial impression counts, you are doing really good work.

With the recent retirement of Bob Smigelski after 250 years with The Andersons (my number) and my recent move to the Maumee, Ohio, headquarters from Delphi, Indiana, I've been asked to fill his size 45 shoes (his number) as company liaison to NC-213. Smig has finished his six-week tour of New Zealand and is consulting in grain-related industries. No doubt he'd attend GEAPS Exchange and NC-213 workshops if we'd accommodate his busy vacation schedule!

Seriously, though, Bob was helpful to my career and instrumental in my nomination as company liaison to NC-213 and appointment to the Industry Advisory Committee.

By way of a brief background, I did my bachelor's in business at Southern Methodist University in Dallas, spent 2.5 years in the Peace Corps in Malaysia as an ag coop advisor, earned my master's degree in agricultural economics from Ohio State, and worked for Continental Grain at the Mississippi River terminals before joining The Andersons in 1984. My career path was grain merchandising and facility general management until my recent move to Maumee as our vice president of the Grain Division.

The Andersons operates 13 grain facilities in the eastern Corn Belt, handling some 200 million bushels of corn, beans, and wheat. The company's 80 million bushels of space puts us in the top 10 of grain storage capacity and makes us HIGHLY interested in grain-quality issues.

What do we see as near-term issues? First, the growth in ethanol appears to encourage a shift to more corn acres. New hybrids promise better ethanol yield and different by-product quality. More domestic demand implies more grain storage.

The boom in DDGS production has storage, handling, and feeding implications. DDGS (distillers dried grain with solubles) is the spent corn after the starch is converted to sugar and fermented into alcohol. The DDGS typically is higher protein than corn (25% vs. 10%), high fiber, and lower energy.



Joe Needham

In two years, the United States will be producing about 27 million tons of that product dried to 10% moisture, compared to less than 10 million last year. It replaces corn and bean meal in feed rations. It is better for ruminants (cattle) than hogs or poultry.

What we do with DDGS and how it can be dried, stored, shipped, pelletized, and mixed are all big questions. Meanwhile, DDGS concentrates mycotoxins (aflatoxin) at about three times the level of that found in corn. That adds more issues, obviously.

New enzyme research seems to be touching almost every aspect of grain production—from seed to inputs to output traits to storage and handling characteristics.

As you know, probably better than those of us in industry, that's just the tip of the iceberg. We're also interested in the best structure for NC-213 and The Andersons' Grain Quality Research Fund to accomplish its mission. And we think you see many opportunities we haven't yet envisioned, so we want to help facilitate those ideas getting some peer review.

I'm excited to be a participant in the NC-213, grain industry, USDA, and land-grant university efforts to identify, study, and share the best possible research on grain quality. It will continue to pay handsome returns.

Thanks for the warm welcome.

Joe Needham
Vice President, Grain Division
The Andersons, Inc.

419-891-6334 phone
419-708-6611 cell
419-891-6513 fax
joe_needham@andersonsinc.com

OSU Breeds Wheat With Millers, Markets in Mind

Ohio State University's wheat-breeding efforts are focused on developing varieties that give producers high yields and disease resistance while meeting the needs of millers, explained Clay Sneller, associate professor in the Department of Horticulture and Crop Science and a specialist in wheat breeding and genetics.

Besides the flour yield, wheat breeders are interested in flour texture and functionality factors such as water absorption, protein quality and composition (gluten strength), sugar, starches, ash, and enzymes. The ideal variety for a specific use would rate excellent for all these characteristics, as well as for grain yield and disease resistance.

Unfortunately, the chances of finding that ideal variety are about one in 10 million, Sneller notes. The chances of finding a variety that offers excellent yield and rankings that are acceptable or better for all the other traits are about one in 1,300.

In the future, a nationwide research effort to identify molecular markers for different traits could cut down on the number of trials needed to develop a new variety.

"Hopefully, it will improve our odds of coming up with these new lines," Sneller explains. In the meantime, Ohio State's wheat-breeding program is evaluating about 25,000 crosses a year.

Sneller is also comparing the quality and stability of wheat raised in Ohio and wheat raised in Nebraska for use in tortillas. The question is whether Ohio producers could benefit from the growing market demand for tortillas, he explains. "It looks like right now that the answer is yes."

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NC-213 Engineers, Scientists, Economists Share Their Research...

Grain Research May Also Help Protect Your House

Dampwood termites of the genus *Zootermopsis* are an abundant group of basal termites found in temperate forests of western North America. Three species are currently recognized, and one of these species is subdivided into two subspecies. Reliable differentiation between species members requires hydrocarbon analysis of fresh specimens and requires long periods of time.

We used the same near-infrared analytical techniques developed for single kernels of grain to identify the various species and subspecies with greater than 99% accuracy when coupled with neural network analysis. Access to this fast, reliable, and economical means of determining species and subspecies will benefit scientists studying these very destructive pests, and it will help termite control companies optimize control strategies.

Floyd Dowell: 785-776-2753; e-mail: floyd.dowell@gmprc.ksu.edu

Extrusion of Pre-Cooked Flours Improves the Quality of High-Fiber Baked Goods

Cereal products with high fiber can reduce calorie intake and provide health benefits linked to chronic disease. However, high-fiber content tends to diminish the final product quality and consumer acceptability of cereal products like baked goods and pasta.

In a collaborative research project with Dr. Sajid Alavi and Dr. Tom Herald of Kansas State University, pre-cooked flours were produced using a lab-scale twin-screw co-rotating extruder configured for low shear and low temperature. Swelling and pasting properties of the pre-cooked flours were characterized using rapid visco-analyzer standard methodology. The quality of cookies and tortillas was also characterized using approved methods from the American Association of Cereal Chemists.

Results showed that, while the pre-cooked flour had similar pasting and swelling properties when compared to commercially available flours, it had increased water absorption. Cookie diameters using the high-fiber pre-cooked and extruded flours were comparable to those obtained with the commercial flour. The weight, diameter, height, and specific volumes of the tortillas were also comparable to those obtained with the commercial flour. These results suggest that extrusion technology can produce pre-cooked wheat flour containing high fiber with the same functionality as commercially available flour.

Scott Bean: 785-776-2725; e-mail: scott.bean@gmprc.ksu.edu

How Long Can You Store That Rice Without Having Insect Pest Problems?

Rice is a major component of crop production areas in the south-central United States. After rice is harvested, it is dried and typically stored as rough, unhulled kernels. During storage, it is vulnerable to attack by stored-grain insects

which can result in substantial economic loss. Two major pest species are the lesser grain borer and the rice weevil. One integrated pest management strategy for stored grain, including rough rice, is the use of low-volume aeration with ambient air to lower the temperature within the grain mass. This reduction in grain temperature will slow population growth of insect pests.

In cooperation with Texas A&M University, the University of Arkansas, and the University of Missouri, we have developed a web-based Post-Harvest Grain Management program for stored rice (<http://beaumont.tamu.edu/RiceSSWeb>). This program allows users to create different scenarios of bin and fan configurations and different initial conditions of pest infestations and to simulate changes in grain temperature and moisture content. Bin temperatures, insect populations, and grain damage are predicted from the simulations.

Historical weather data are used to classify rice production in this region of the United States into different regions or zones for rice storage. The weather data are further used to predict durations required for cooling at different aeration airflow rates for each zone. Results show the potential for expanded use of aeration in pest management programs for stored rice.

Frank Arthur: 785-776-2783; e-mail: frank.arthur@gmprc.ksu.edu

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Center Director to Retire in August After 20 Years of Federal Service

August 31 will be the last official work day for Dr. Don Koeltzow who has been the director of the Grain Marketing and Production Research Center (GMPRC) since February 3, 1996.

Dr. Koeltzow is a native of New Mexico where he earned a B.S. degree in chemistry from the New Mexico Institute of Mining and Technology in 1966. He attended graduate school at the University of Illinois in Urbana where he earned both M.S. (1968) and Ph.D. (1970) degrees in biochemistry.

After a post doctorate in medical microbiology at Stanford University, Dr. Koeltzow joined the faculty of Luther College in Decorah, Iowa, where he taught multiple courses in chemistry, biochemistry, and computer science for 15 years. He also served as head of the Department of Chemistry for the last 10 years of his teaching career.

In 1986, he accepted a position as chief of the research and development branch of the Federal Grain Inspection Service in Kansas City, Missouri, and in 1996, he accepted the position of director of GMPRC. He often stated that his time at GMPRC was "The best time of my scientific career because of the very significant research at the Center and because of the people it has been my pleasure to serve with."

Dr. Koeltzow and his wife, Kathy, will move to their permanent home in the mountains of Colorado between Gunnison and Montrose just off Highway 50.

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Dr. Don Koeltzow

NC-213 Web Site Updates

If you have recently visited the NC-213 web site, you have probably noticed some changes.

The web site starts off with the explanation of a Multistate Project, now followed by a more project-team-focused message. This message is geared more towards the core participants of NC-213, and information posted is timely and relevant.

Another addition to the web site is a section that lists the awarded research grants for both regular and team competitions.

The web site still offers past issues of the Grain Quality Newsletter, past meeting minutes, past progress reports, and a complete listing of executive committee members and station representatives.

Suggestions for the web site are always welcome!

The Ohio State University
Ohio Agricultural Research and Development Center
1680 Madison Avenue
Wooster, Ohio 44691-4096