

# Grain Quality Newsletter

News and Highlights from NC-213: Marketing and Delivery of Quality Grains and BioProcess Coproducts.

Volume 32:2

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

## Calendar Items of Interest

### Upcoming deadlines and events:

- NC-213 Annual Meeting 2013: Our next annual meeting will take place in Kansas City, Missouri, at the Embassy Suites KCI. We will be meeting with the Wheat Quality Council. Details are being finalized. Meeting dates: February 12–13, 2013.
- Andersons Research Grant Program—Team Competition 2012: The RFP was released in May 2012 with a due date for proposals of August 31, 2012.
- Andersons Research Grant Program—Regular Competition 2011: 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.

### Here are some international events that might be of interest:

- 4–8 August: 2012 American Phytopathological Society, APS Annual Meeting, Providence, RI, USA. Web: [www.apsnet.org](http://www.apsnet.org)
- 6–9 August: 14th ICC Cereal and Bread Congress, Beijing International Convention Center, Beijing, China. E-mail: [anita.habershuber@icc.or.at](mailto:anita.habershuber@icc.or.at); Web: [www.icc.or.at/14th\\_ICC\\_CBC.pdf](http://www.icc.or.at/14th_ICC_CBC.pdf)
- 12–15 August: 11th International Gluten Workshop, Fragrant Hill Empark Hotel, Beijing, China. E-mail: [zhhecaas@163.com](mailto:zhhecaas@163.com); Web: <http://conferences.cimmyt.org/>
- 9–11 September: All Things Baking, Houston, TX, USA. E-mail: [info@allthingsbaking.org](mailto:info@allthingsbaking.org); Web: <http://allthingsbaking2012.com/>
- 16–21 September: IBA 2012 International Trade Fair: World Market for Baking, Munich, Germany. E-mail: [zv@baeckerwek.de](mailto:zv@baeckerwek.de); Web: [www.german-bakers.org](http://www.german-bakers.org)
- 30 September–3 October: 2012 AACCC International Annual Meeting, Westin Diplomat Hotel, Hollywood, FL, USA. E-mail: [rwilkie@scisoc.org](mailto:rwilkie@scisoc.org); Web: [www.aaccnet.org/meetings/default.asp](http://www.aaccnet.org/meetings/default.asp)
- 30 September–3 October: 126th AOAC Annual Meeting & Exposition, Planet Hollywood, Las Vegas, NV, USA. E-mail: [meetings@aoac.org](mailto:meetings@aoac.org); Web: [www.aoac.org](http://www.aoac.org)
- 10–12 October: Turkish Food Congress, Hatay, Turkey. E-mail: [hatay11gidakongresi2012@gmail.com](mailto:hatay11gidakongresi2012@gmail.com); Web: [www.gidakongresi2012.org](http://www.gidakongresi2012.org)
- 10–12 October: V. International Symposium on Sourdough—Cereal Fermentation for Future Foods, Helsinki, Finland. E-mail: [annemari.kuokka@vt.fi](mailto:annemari.kuokka@vt.fi); Web: <http://virtual.vtt.fi/virtual/sourdough/index.htm#Welcome>
- 17–18 October: 63th JTIC International, the Milling & Cereal Industry Meeting. Annual French Conference for the Cereal Industries (JTIC), Reims, France. Web: [www.jtic.eu](http://www.jtic.eu)

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



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## NC-213 Announces New Members to the Industry Advisory Committee

NC-213 is proud to announce that **Chuck Hill**, Specialty Products Manager, AgriGold Hybrids, as the Chair—NC-213 Industry Advisory Committee. Chuck will lead the committee in serving in an advisory role to NC-213, its Executive Committee, and its membership. In addition, the committee serves as a reviewer pool for The Andersons Grant Review Committee, acts as a liaison between NC-213 researchers and the industry, actively encourages existing industry stakeholders and recruits new industry stakeholders to participate in NC-213, and provides active feedback regarding research agendas and results. Chuck replaces long-time Chair James Stitzlein (1997–2011).

Chuck will be a great asset as he grew up on family grain farm near Maroa, Illinois. He attended Illinois State University earning a Bachelor of Science in Agribusiness in 1982. He was a member of the Alpha Gamma Rho fraternity.

Chuck has been with AgriGold since 1987 in the positions of District Sales Manager and Specialty Products Manager. In his current role, Chuck is responsible for the development and marketing of output trait based hybrids for AgriGold. This includes yellow and white food grade corn, waxy corn, and conventional hybrids for non-GMO markets. His job involves working with corn breeders to develop hybrids for these markets. He presents these products to the corn processors and buyers for approval to be added to their lists. Chuck also supports his local sales force with support materials and personal visits to increase their share in specialty markets.

In addition to Chuck, **Morrie Bryant**, Business Manager—Corn Processing, Pioneer, is joining the NC-213 Industry Advisory Committee as a member at large. As Business Manager—Corn Processing, Morrie is responsible for the relationships Pioneer has with the corn processing and grain handling communities. He works with corn dry millers, corn wet millers, snack food manufacturers, and specialty grain handlers in identifying hybrids and sourcing grain with exceptional milling qualities. Morrie also is a member of a team within Pioneer that manages the Pioneer waxy, white, and yellow food grade product lines.

NC-213 welcomes these newest members of the Industry Advisory Committee.



Chuck Hill



Morrie Bryant

## NC-213 Annual Meeting in Review

At this year's NC-213 Annual Meeting/Winter Technical Sessions, meeting participants enjoyed sharing research that was presented during the technical sessions held March 6–7, 2012, in Minneapolis, Minnesota. Eighteen presentations, given by graduate students, professors, members of industry, and USDA agencies, showcasing research from the three objectives, were presented. Meeting attendees had the opportunity to interact with each other and with individuals attending the GEAPS Exchange 2012 President's Banquet. During the Banquet, Dr. F. William (Bill) Ravlin, Administrative Advisor NC-213, presented

The Andersons Cereals and Oilseeds Award of Excellence (see more details below). Co-Masters of Ceremonies were Mark Fedje, International President GEAPS, and Gary Vaughn, Associates Board President GEAPS.

For 2013, NC-213 will be meeting in Kansas City at the Embassy Suites KCI with the Wheat Quality Council. The dates of the meeting are February 12–13, 2013. On Tuesday, we will have a joint luncheon that will include our annual awards.

Another great year for NC-213 and another great Annual Meeting.

## 2012 Andersons Cereals and Oilseeds Award of Excellence Presented to Dr. Subramanyam "Subi" Bhadriraju, Professor, Department of Grain Science & Industry, Kansas State University

Dr. Subramanyam "Subi" Bhadriraju is recognized by his colleagues on and off campus and by industry stakeholders around the world as a leader of people and stored product protection programs, focusing on dry, durable stored commodities. Most recently he was appointed as the Donald A. Wilbur Endowed Professor in Stored-Product Protection by the Dean of the College of Agriculture at Kansas State University. This endowed professorship is jointly administered by the departments of Entomology and Grain Science & Industry. He truly exemplifies excellence in scholarship, creativity, and discovery that is worthy of The Andersons Cereals and Oilseeds Award of Excellence.

Subi is recognized nationally and internationally for his expertise and leadership in applying Integrated Pest Management to the protection of dry, durable commodities and their products from the farm to the fork. He was already an outstanding scientist and researcher in the field of stored-product entomology and food protection before he came to Kansas State University in May 1999. Upon his arrival he immediately began a new fundamental and applied research program in the ecology and management of insects in stored grains and grain-based products, on farms, in flour and feed mills, food warehouses, and retail outlets.

He developed techniques to use heat as an alternative to fumigating of food-processing structures with ozone-depleting and globally banned methyl bromide, and has hosted a series of international workshops that have facilitated the adoption of this non-chemical alternative by practitioners. He has documented the benefits of using this technology by cooperation with seven food companies in the United States and one in Greece.

Thanks to Subi, organic and conventional grain producers and processors will now have a cost-effective, non-chemical alternative choice for the protection of stored grains and grain-based products.

His research has led to numerous important findings and scientific discoveries.

Congratulations, again, Subi.



Subramanyam Bhadriraju

## NC-213 Participants Share Their Research...

Here are the latest research activities involving NC-213 scientists. This information is shared, by permission, from the USDA-ARS Center for Grain and Animal Health Research, Manhattan, Kansas.

### **A Comparison of Auction and Choice Experiment: An Application to Consumer Willingness to Pay for Rice with Improved Storage Management**

*Authors: L. Su, B. Adam, J. Lusk, F.H. Arthur*

*Submitted to: Journal of Agricultural and Resource Economics*

Stored-product insects such as the lesser grain borer are generally removed from rough rice during the milling process, so that there should be little effect of that infestation on taste and quality of the milled rice. We conducted actual taste test studies with a consumer panel to see if this was true. We then developed a test to determine if our panelists would pay more for rice if they knew it was being specifically managed to reduce insect infestations. We used two methods for the test, an "auction" where consumers could bid specific prices and choice of two different prices, the higher one reflecting improved management. Results showed consumers may pay a higher price for perceived improvements in rice quality, especially when given specific information as to how the rice was managed to limit insect infestation. Results will benefit those responsible for developing insect management programs for stored bulk rice, which in turn will benefit consumers by providing them with higher product quality.

*Contact Frank Arthur, telephone 785-776-2783, E-mail: Frank.Arthur@ars.usda.gov*

### **Separation of Alcohol Soluble Sorghum Proteins Using Non-Porous Cation-Exchange Columns**

*Authors: D.L. Blackwell, S. Bean*

*Submitted to: Journal of Chromatography A*

Kafirins, the storage proteins and major protein class of the cereal grain sorghum, play an important nutritional role for millions of people in parts of Africa and Asia. We developed a new method that improves the separation of the major kafirin type, the alpha kafirins. It is known that there are up to 19 different proteins that make up the alpha kafirins. However, the most common method for separating sorghum proteins, gel electrophoresis, is only capable of separating the alpha kafirins into two broad classes. The ion-exchange method that we developed shows improved resolution of the alpha kafirins and can be used to study the allelic variation of sorghum proteins and to identify which alleles show desirable traits such as improved protein digestibility.

*Contact Scott Bean, telephone 785-776-2725, E-mail: Scott.Bean@ars.usda.gov*

### **Sampling Stored Product Insect Pests: A Comparison of Statistical Sampling Models to Maximise Pest Detection**

*Authors: D. Elmoultie, A. Keirmeier, P.W. Flinn, B. Subramanyam, D. Hagstrum, G. Hamilton*

*Submitted to: Pest Management Science*

Sampling stored grain for insect pests is critical for maintaining grain quality and to determine if insect control is necessary. To develop the best sampling protocol for stored grain it is important to select a statistical model that explains how the insects are distributed in the grain, because the model can be used to predict the number of samples necessary to detect insects in the grain. In collaboration with scientists from Queensland University of Technology and Kansas State University, we compared the accuracy of four different statistical models to detect insects in grain. Of the four models, the compound model performed the best under both high and low insect densities. The findings from this study will be used to improve insect pest management programs for stored grain.

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### **Effect of Canopy Leaf Distribution on Sand Transport and Abrasion Energy**

*Authors: L.J. Hagen, M. Casada*

*Submitted to: Aeolian Research*

When crop canopies are short or sparse, wind erosion can uncover plant roots, deplete the soil resource, and damage plants by abrasion and desiccation. This study determined the effects of number and distribution of leaves on threshold velocities, sand transport rates, and relative abrasion energy among simulated soybean seedling plant canopies. Six canopies were tested in a wind tunnel with the floor covered with sieved sand using maximum freestream wind speeds from 30 to 38 mph. The height above the surface of maximum abrasion energy also increased with wind speed in the plant canopy, but remained nearly constant over a bare sand surface. When leaves were located nearest the surface, they modified the vertical abrasion profiles by deflecting a portion of the sand impact energy upward in the wind stream. The modified abrasion profiles differed from that for isolated plants subject to profiles that develop over a bare surface upwind of the plants. Hence, it may be important to place test plants within a canopy of similar plants when conducting plant abrasion tests using sand. In contrast, abrasion on inter-row flat soil containers was independent of wind speeds, but was slightly higher without a canopy compared to measurements in the canopy with a similar sand discharge.

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### **Discrimination of Conventional and Roundup Ready Soybean Seeds: Transmittance versus Reflectance Measurements and Moisture Effect**

*Authors: L.E. Agelet, G.R. Rippke, P.R. Armstrong, J.G. Tallada, C.R. Hurburgh*

*Submitted to: Journal of Near Infrared Spectroscopy*

Roundup Ready® soybeans which are resistant to Roundup® herbicide were one of the first genetically modified commercial crops recognized as safe. However, most current worldwide regulations for importing and exporting food demand the control, identification, and proper labeling of all genetically modified agriculture products. Previous studies have shown that Near Infrared Spectroscopy (NIRS) could distinguish between Roundup Ready® (RR) and conventional soybeans at the bulk and single-seed sample level. This recent study found that NIRS was able to discriminate between five conventional varieties and their respective Roundup Ready® version. Correct classifications ranged from 82% to 98%. Moisture content of the seeds was found to affect classification accuracy and may limit the use of the NIRS instrumentation tested as a screening tool where moisture can be controlled.

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### **Infrared Spectral Properties of Germ, Pericarp, and Endosperm Sections of Sound Wheat Kernels and Those Damaged by *Fusarium graminearum***

*Authors: K.H.S. Peiris, W.W. Bockus, F.E. Dowell*

*Submitted to: Journal of Applied Spectroscopy*

*Fusarium* head blight (FHB) is a fungal disease of wheat and other small-grain cereals that can reduce grain yield and quality when warm, humid weather conditions are experienced at the time of flowering. The food and feed prepared from *Fusarium*-damaged grains pose a health risk to humans and animals due to the presence of mycotoxins. We studied the pericarp, germ, and endosperm of individual kernels to determine the mycotoxins and fungi in each component using infrared spectroscopy. We found large differences in the pericarp and germ of infected and uninfected kernels, but little difference in the endosperm. These results show that infrared spectroscopy can be used to study where fungi and mycotoxins are concentrated in individual kernels. This will help wheat breeders study resistance mechanisms, and processors determine ways to reduce fungi and toxins in flour.

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