

Grain Quality Newsletter

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

Volume 33:1

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

Texas A&M Offers Distance Education Graduate Certificate in Regulatory Science

Five online graduate courses are part of a Regulatory Science in Food Systems graduate certificate recently accredited by the Southern Association of Colleges and Schools (SACS). As an outcome of completing these graduate courses, students will be equipped to participate on risk management teams; interpret and implement U.S. and international laws, regulations and standards; establish practical strategies for compliance; implement a laboratory quality system; and communicate the cost and benefits of regulatory decision making and compliance to management and consumers. The Texas A&M University Regulatory Science graduate program advances the science of creating tools, standards, and practices to improve the protection and compliance of food systems. The course instructors are faculty possessing years of experience as university professors and regulators, providing a one-of-a-kind insight into this discipline. An *International Journal of Regulatory Science* (IJRS) will accompany this curriculum. The first issue of IJRS is targeted for December 2012, and will address the impact of the Food and Drug Administration's blending policy involving aflatoxin contaminated corn in the Midwestern United States on food safety and feed inventory. For more information, visit <http://regsci.tamu.edu/>.

The Grain Quality Newsletter is published and distributed at no charge to NC-213 (formerly NC-151) participants and supporters of research on "Marketing and Delivery of Quality Grains and BioProcess Coproducts."

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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 February 12–13 in Kansas City, Missouri. 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 Wheat Quality Council Annual Meeting. During the NC-213 Annual Meeting, Dr. F. William (Bill) Ravlin, Administrative Advisor/Coordinator, NC-213, presented The Andersons Cereals and Oilseeds Award of Excellence to Dr. Mark E. Casada, Lead Scientist, Center for Grain & Animal Health Research (CGAHR), USDA-ARS, Manhattan, Kansas. The Andersons Cereals and Oilseeds Award of Excellence was created in 1999 to recognize individuals or teams that have made superior contributions to science and/or education related to cereals and oilseeds. Mark was selected for this award based on his well-documented history of superior contributions to science and education related to cereals and oilseeds.

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



Mark E. Casada

"Collaboration between industry and the research community is vital to solving the issues the grain industry faces. At the recent NC-213 Annual Meeting a panel of industry representatives presented issues that affect the wheat and corn industry. The panel included Mark Macrander, Ingredient; Morrie Bryant, Pioneer; Steve Nenonen, Romer Labs; Bruce Roskens, Grain Millers Inc.; Don Sullins, ADM Milling; and Moderator Chuck Hill, AgriGold Hybrids. The panel addressed many issues including mycotoxins, food safety, and quality issues facing large growers. Comments from researchers in the audience suggest many project ideas will come from the discussion."

—Chuck Hill, Chair, NC-213 Industry Advisory Committee

NC-213 Scientist Receives International Research Award

The American Association of Cereal Chemists International (AACCI) has awarded the 2013 AACCI Young Scientist Award to Senay Simsek, assistant professor in hard red spring wheat end quality at North Dakota State University. The award is annually "presented to an individual for outstanding contributions in basic and applied research to cereal science with the expectation that contributions will continue." As winner of the award Simsek will present a lecture on "Cereal Metabolomics: Challenges and Opportunities" at the AACCI Annual Meeting in Albuquerque, New Mexico, in September 2013.

Simsek's research focuses on the effects of the chemical composition of grains (mainly wheat) on end-product quality. She has conducted research and supervised activities in structure function relationship among bio-macromolecules (particularly, starch and non-starch polysaccharides) found in food systems. She joined the department of Plant Sciences at NDSU in 2007 after earning her Ph.D. in food science at Purdue University in 2006.

AACCI provides opportunities for cereal grain scientists through continuing education and networking. Also, AACCI is recognized as a scientific authority for worldwide regulatory agencies, which allows for timely and expert advice and recommendations when grain industry issues arise. Nearly 2,500 global scientists and food industry professionals are members of AACCI.





CGAHR (Center for Grain and Animal Health Research) Update

Awards and Recognition

Dr. Frank Arthur, Research Entomologist in the CGAHR's Stored Product Insect Research Unit (SPIRU), was selected to receive the Recognition Award in Entomology by the Entomological Society of America and sponsored by Syngenta Crop Protection. This national award recognizes Frank for his significant contributions to entomological science and agriculture. Congratulations, Frank!

Meetings and Conferences

Scott Bean, Deidre Blackwell, Prini Gadgil, Tom Herald, Rhett Kaufman, and Jeff Wilson attended the Great Plains Sorghum Conference/Sorghum Research and Utilization Conference held at Kansas State University, August 28–30, 2012.

Grants

Frank Arthur will be receiving \$16,650 from Central Sciences International as part of a Trust Agreement to evaluate the grain protectant methoprene (Diacon II®) for residual efficacy on different grains (wheat, rough rice, brown rice, and corn).

Latest Research Results

Assessing Effects of Esfenvalerate Aerosol Applications on Resident Populations of *Tribolium castaneum* (Herbst), the Red Flour Beetle, Through Direct and Indirect Sampling

Authors: F.H. Arthur, J.F. Campbell, E.A. Fontenot

Submitted to: *Journal of Stored Products Research*

Aerosol insecticides are used to control red flour beetles in flour mills, but there is little information on how these aerosols affect resident beetle populations. We conducted studies by placing food (flour) containing different life stages of beetles underneath metal shelves inside small sheds. The sheds were either untreated or sprayed every 2 or 4 weeks with the labeled rate of the pesticide esfenvalerate, trade name Conquer. The aerosol treatments did not affect the population development in the flour. However, there were more dead beetles in the treatments compared to the controls, and more live beetles in pheromone traps in the controls compared to the treatments. Results show that although the aerosol applications reduced overall insect numbers, the presence of available food material allowed for continued population development.

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Genetic Structure of a Diverse Sorghum Collection and Association Mapping for Grain Quality

Authors: S. Sukumaran, W. Xiang, S. Bean, J.F. Pedersen, M.R. Tuinstra, T.T. Tesso, M.T. Hambelin, J. Yu

Submitted to: *The Plant Genome*

Grain sorghum is a genetically diverse crop; however, little is known about how this diversity relates to grain quality traits. To gain an understanding of the relationships between grain quality and genetic diversity in sorghum, candidate gene association mapping was used on a diverse collection of 300 sorghum accessions. Data analysis resulted in the identification of eight significant marker-trait associations including markers for grain hardness and starch synthesis genes. Knowledge on the genetic basis of grain quality traits will complement breeding efforts to improve sorghum grain quality.

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Evaluation of Sorghum [*Sorghum bicolor* (L.) Moench] Lines and Hybrids for Cold Tolerance Under Field and Controlled Environments

Authors: M. Kapanigowda, R. Perumal, R. Aiken, T.J. Herald, S. Bean, C.R. Little

Submitted to: *Crop Science*

Early season cold tolerance in sorghum contributes to emergence, seedling establishment, early vegetative growth, and reduces damping-off diseases under chilling conditions. The objectives of this study were to identify cold tolerant sources and to evaluate and optimize rapid screening techniques under a controlled environment. Forty-eight genotypes were selected and grown during 2011 in two locations. The results of the study showed that late emergence produces greater biomass compared to early emergence. A potting mixture study concluded that soil+vermiculate mix is more effective for controlled environment cold tolerance screening than soil+sand or soil+peat potting mixes.

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Infrared Absorption Characteristics of *Culicoides sonorensis* in Relation to Insect Age

Authors: K.H.S. Peiris, B.S. Drolet, L.W. Cohnstaedt, F.E. Dowell

Submitted to: *Medical and Veterinary Entomology*

Biting midge *Culicoides sonorensis* is the vector that transmits Bluetongue viral disease in domestic

and wild ruminant animals. Only female adult insects can transmit the disease. Determination of the age structure of female insect population is important before adopting control interventions, in that control of the disease becomes more effective only when the proportion of adult insects is high in the insect population. Present methods of age determination of *Culicoides* midges are laborious and time consuming. Therefore, we investigated the absorption of mid-infrared light in relation to the age of insects. We noted that systematic changes in infrared absorptions at specific wavelengths occur with the age of insects. As a result, infrared spectroscopy can be used to determine the age structure of insect populations. This will enable rapid determination of the age composition of midge populations, which will help implementation of insect control programs to manage dissemination of Bluetongue disease effectively.

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Measurement of Single Soybean Seed Attributes by Near Infrared Technologies: A Comparative Study

Authors: L.E. Agelet, P.R. Armstrong, I.R. Clariana, C.R. Hurburgh

Submitted to: *Journal of Agricultural and Food Chemistry*

Measurement of single-seed composition for soybean breeders allows the selection of seeds with traits attributed to either genetics or agronomics, or both of these influences in combination. Four single-seed near infrared spectrometer systems were evaluated for their ability to predict soybean oil content, protein content and seed weight. Each system used slightly different measurement methods. The ability to predict seed traits varied somewhat by what trait was being measured and which system was used. For most cases the best measurement systems were for those that measured seed traits from several angles facilitated by the seed moving during measurement. This work helps breeders to determine the accuracy that can be obtained with single-seed near infrared measurement and what instrumentation system is best suited for the trait they are trying to measure. Ultimately, single-seed selection can expedite and reduce costs of varietal development by easily selecting varietal lines with the desired traits.

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To learn more about CGAHR, please visit www.ars.usda.gov/npa/cgahr.

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2012 Corn Harvest Quality Report Now Available Online

This link provides access to the 2012 Corn Harvest Quality Report, which was sponsored by the U.S. Grains Council. It may be of interest to several members of NC-213.

<http://www.grains.org/images/cornqualityreport/201213%20Harvest%20Report/Harvest%20Report%20Final%20121205.pdf>