

Grain Quality Newsletter

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

Volume 33:2

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

International Events

- August 25–28: "ICC Conference 2013." Perth, Australia. Contact: ICC—International Association for Cereal Science and Technology. General Secretariat. Marxergasse 2 A–1030 Vienna, Austria. Tel: +43 1 707 72020, Fax: +43 1 707 72040, E-mail: office@icc.or.at, Web: www.icc.or.at
- August 25–28: "127th AOAC Annual Meeting & Exposition." Chicago, IL, USA. Contact: AOAC INTERNATIONAL. 481 N. Frederick Avenue, Suite 500 Gaithersburg, MD 20877 USA. Tel: +1 (301) 924 7077, Fax: +1 (301) 924 7089, E-mail: meetings@aoac.org, Web: www.aoac.org
- September 5: "XIX Annual International Conference, Black Sea Grain and Oilseeds 2013/14." Moscow, Russia. Contact: Ms. Anna Gerasimova, Deputy Director. Business Events Department, International Relations, Russian Grain Union. Tel/Fax: +7(495) 607-82-85/124, E-mail: gaa@grun.ru
- September 29–October 2: "2013 AACCI International Annual Meeting." Albuquerque Convention Center. Albuquerque, NM, USA. Contact: Rhonda Wilkie, AACCI Headquarters. 3340 Pilot Knob Road St. Paul, MN, 55121-2097, USA. Tel: +1 (651) 454 7250, Fax: +1 (651) 454 0766, E-mail: rwwilkie@scisoc.org, Web: www.aacnet.org/meetings
- October 6–9: "BEMA's 2013 Annual Meeting." Broadmoor Resort. Colorado Springs, CO, USA. Contact: Jennifer Prusa, Chameleon Resources. E-mail: jprusa@bema.org, Web: www.bema.org
- October 6–9: "International Baking Industry Exposition, IBIE 2013." Las Vegas Convention Center. Las Vegas, NV, USA. Contact: Web: www.ibie2013.org, www.bakingexpo.org
- October 15–18: "VIII International Grain Trading Conference, Global and Middle East Grain Outlook 2013." Sharm El Sheikh, Egypt. Contact: Ms. Anna Gerasimova, Deputy Director. Business Events Department, International Relations, Russian Grain Union. Tel/Fax: +7(495) 607-82-85/124, E-mail: gaa@grun.ru
- October 21–23: "Oilseed & Grain Trade Summit (formerly the Soy & Grain Trade Summit)." Hyatt Regency Minneapolis. Minneapolis, MN, USA. Contact: HighQuest Partners. Ms. Şule Basa. E-mail: sule.basa@gmail.com, Web: www.oilseedandgraintrade.com
- October 24–26: "2nd International Symposium on Traditional Foods from Adriatic to Caucasus." Ohrid–Struga, Macedonia. Contact: E-mail: traditionalfoods2013@nku.edu.tr. Web: http://traditionalfoods2013.nku.edu.tr/
- November 5–8: "24th Annual IAOM Mideast and Africa District Conference and Expo." Mövenpick Resort & Marine Spa Sousse. Sousse, Tunisia. Contact: Ms. Eva Mulyana, Conference Manager. IAOM MEA District, PO Box 566, P.C. 112 Ruwi, Muscat, Sultanate of Oman. Tel: +968 2471 2338, Fax: +968 2471 1340. E-mail: info@iaom-mea.com, Web: www.iaom-mea.com, www.iaom-mea.com/tunisia2013
- November 7–9: "8. Food Engineering Congress." Ankara, Turkey. Contact: Chamber of Food Engineers. Meşrutiyet Cad. No: 22/13 Kızılay, Çankaya, Ankara, Turkey. Tel: +90 (312) 418 2826, Fax: +90 (312) 418 2843, E-mail: kongre@gidamuhendisligikongresi.org, Web: www.gidamuhendisligikongresi.org, www.gidamo.org.tr
- November 12–14: "TGDF Food Congress, 2011 – 10 to 100th Year." Sueno Otel. Side, Antalya, Turkey. Contact: Mr. Ali Reşat Yılmazbilen. COMART Kurumsal İletişim Hizmetleri Ltd. Şti. Ceyhun Atif Kansu Cad. 1386. Sok. No: 8 Kat: 2 Balgat, Ankara, Turkey. Tel: +90 (312) 284 7778, Fax: +90 (312) 284 7779. E-mail: aliresat@comart.com.tr, Web: www.gidakongresi.com
- November 13–14: "64th JTIC International, The Milling & Cereal Industry Meeting, Annual French Conference for the Cereal Industries (JTIC)." Reims, France. Contact: E-mail: aemic@wanadoo.fr, Web: www.jtic.eu

NC-213 Annual Meeting—Mark Your Calendar Now! Reserve Your Presentation Slot Now!

The NC-213 Executive Committee, led by Klein Ileleji, Purdue University, is excited to announce that the 2014 NC-213 Annual Meeting will be held February 25–26, 2014, at the Hilton Omaha, in conjunction with GEAPS Exchange 2014. Here is a "snapshot" of the meeting's program:

Tuesday, February 25		Wednesday, February 26	
7:00 a.m.	Registration opens for GEAPS Exchange 2014	8:00 a.m.	Registration opens for NC-213 Annual Meeting/ Technical Sessions 2014
7:30 a.m.	Educational Sessions open for GEAPS Exchange 2014	8:00 a.m.	NC-213 Technical Sessions open/NC-213 Business Meeting/NC-213
Noon	Registration opens for NC-213 Annual Meeting/Technical Sessions 2014	Around noon	Buffet lunch with NC-213 Annual Business Meeting
Noon	Boxed lunches available for NC-213 participants	3:00 p.m.	NC-213 Annual Meeting adjourns
1:00 p.m.	NC-213 Technical Sessions open		
5:00 p.m.	NC-213 Technical Sessions end		
6:00 p.m.	GEAPS Exchange pre-dinner reception (cash/ticket bar)		
6:30 p.m.	President's Banquet		
8:30 p.m.	Club GEAPS		

*Please note: The NC-213 Executive Committee will be holding their annual executive meeting prior to this annual meeting. Special note: If you would like to present, please reserve your slot now! We don't need a title or presenter name. There are still slots available for presentations. Please contact Bill Koshar at koshar.3@osu.edu to reserve your slot.

The Andersons Research Grant Program: Regular Competition Is Announced



From left: Mike Satterlee - CEO, Bill Reed - CEO, and John Grasso CEO

The Andersons Research Grant Program: Regular Competition

Request for Proposals

On-line Submission Deadline: Friday, September 6, 2013

From members of The Andersons, Inc., Chicago, Illinois

NC-213: Marketing and Delivery of Quality Grains and BioProcess Coproducts

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 Andersons Agricultural Research Fund. While this year the competition is open to one institution, a team can still be formed that can foster collaboration between researchers, institutions, and industry. The goal of the Andersons Research Grant Program 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. Please visit the NC-213 website for the current RFP with details (complete with guidelines, funding limits, online submission, and due date).

Kansas State University Is Offering Combustible Grain Dust Workshops

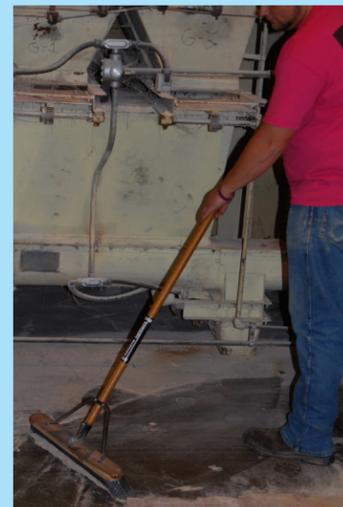
Last month's issue of *World Grain* (Grain Industry Safety Under Media Attack, May 3013) highlighted the pressure our industry is under to reduce grain dust explosions and grain entrapments. The article is right in saying that efforts are being made to educate and train personnel about the dangers and preventive measures for grain dust explosions.

Annual training for all employees at any grain handling facility is highly recommended, especially for new employees and managers on the strategies to mitigate grain dust explosions.

Kansas State University is offering Combustible Dust Workshops this summer. Register now for one of the following workshops. If you cannot attend, forward this article to your co-workers who are also interested. For additional information, please contact Dr. Kingsly Ambrose (kingsly@ksu.edu) or Heather Cook (hjcook@ksu.edu). To register go to: www.grains.ksu.edu/igp.

- July 23, in Mesquite, Texas, at the Texas A&M Extension Service Auditorium. The course will be offered from 8 a.m. to noon in English and a Spanish language course will be offered from 1 to 5 p.m.
- July 30, in Omaha, Nebraska, at the Omaha Hilton from 1 to 5 p.m, in conjunction with the National Grain and Feed Association.
- August 13, in Garden City, Kansas, at the Southwest Research-Extension Office in conjunction with Kansas Grain and Feed Association. The course in English will be offered from 8 a.m. to noon and the Spanish course will be offered from 1 to 5 p.m.
- August 14, in Colby, Kansas, at the Colby Convention Center from 8 a.m. to noon.
- August 16, in Wichita, Kansas, at the Sedgwick County Extension Office from 1 to 5 p.m.
- August 19, in Salina, Kansas, at the Salina Courtyard Marriott from 1 to 5 p.m.
- August 20, in Seneca, Kansas, at the Nemaha Community Building from 1 to 5 p.m.
- September 6, in St. Cloud, Minnesota, at the Kelly Inn Best Western from 8 a.m. to noon, in conjunction with the Minnesota Grain and Feed Association.

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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

CGAHR (Center for Grain and Animal Health Research) Update

Awards and Recognition

Dr. Mark Casada, Research Engineer in the Engineering and Wind Erosion Research Unit, is this year's winner of The Andersons Cereals and Oilseeds Award of Excellence. The award was created in 1999 to recognize individuals or teams that have made superior contributions to science and/or education related to cereals and oilseeds. The award was presented to Mark at the annual meeting of Multistate Project NC-213, "Marketing and Delivery of Quality Grains and BioProcess Coproducts" (NC-213—The U.S. Quality Grains Research Consortium) on February 13, 2013, in Kansas City, MO.

Meetings/Conferences

Dennis Tilley attended the Nebraska Urban Pest Management Conference in Lincoln, NE, on February 12, 2013. He presented results of his research conducted at CGAHR as part of his Ph.D. program of study at Kansas State University.

Floyd Dowell attended the Wheat Quality Council annual meeting in Kansas City, MO, on February 12–14, 2013.

Mark Casada attended the Grain Elevator and Processing Society (GEAPS) Exchange in Louisville, KY, February 23–26. In route to GEAPS, Mark delivered samples to collaborators at the University of Kentucky for his Pack Factor study.

Floyd Dowell traveled to Atlanta, GA, from February 27 to March 1, 2013. He met with a collaborator and received training on new laser and optical technology and he transferred recent NIR spectroscopy findings to researchers there in the agriculture and entomology field.

Frank Arthur, Karrie Buckman, John Diaz-Montano, and Jim Throne attended the Entomological Society of America Annual Meeting held in Knoxville, TN, November 10–15, 2013. Drs. Diaz and Throne presented their posters, "Evaluation of potential attractants for stored-product psocids," and "Distribution of psocids in temperature and moisture gradients in wheat." Drs. Arthur and Buckman presented their talks, "Assessing effects of esfenvalerate aerosol applications on resident populations of *Tribolium castaneum* (Herbst), the red flour beetle," and "Efficacy of fumigation for management of red flour beetle infesting rice mills."

Jim Campbell attended the International Association of Operative Millers Food Protection Committee meeting in Richardson, TX, January 15–17, 2013, to meet with stakeholders.

Frank Arthur and Karrie Buckman attended the Nebraska Urban Pest Management Conference in Lincoln, NE, February 12–13, 2013. Dr. Arthur presented two invited talks: "Aerosol insecticides for management of stored product insects," and "Aeration and insect pest management in stored grain." Dr. Buckman presented two invited talks: "Biology and management of lesser grain borer and Indian meal moth," and "Pheromone monitoring for stored product insect management."

Grants

Kansas Grain Sorghum awarded \$23,333 to **Dr. Scott Bean** and **Dr. Yong-Cheng Shi** (Kansas State University) to conduct research titled, "Developing sorghum flours with increased resistant starch content for health benefits."

Frank Arthur developed a trust agreement with Wellmark International (DBA Central Life Sciences). He received \$16,650 to evaluate the grain protectant methoprene (Diacon II) at rates of 1.25 and 2.5 ppm, for residual efficacy on different grains.

Latest Research Results

Automated Detection of Insect-Damaged Sunflower Seeds by X-Ray Imaging

Authors: T.C. Pearson, J.R. Prasifka, D.L. Brabec, R.P. Haff, B.S. Hulke

Submitted to: Applied Engineering in Agriculture

Breeding efforts to develop insect-resistant sunflowers are hindered by the lack of a quick and effective method for scoring samples in terms of insect damage. The current method for scoring insect damage is tedious and inconsistent as it involves manual inspection of seeds for holes bored into the shell. In this study, a method was developed to quickly place sunflower seeds in a closely packed grid where the seeds were consistently oriented. Subsequently, the grid of seeds was digitally X-ray imaged. A computer program was developed to analyze the images and classify each seed as damaged or undamaged. This computer program uses a simple but novel method for detecting seeds having asymmetrical morphology due to insect feeding. An overall classification accuracy for damaged and undamaged seeds was 95% and 99%, respectively. The method, including placing the seeds into the grid, imaging, and analyzing takes approximately 3 minutes per sample, and should be consistent over time. The method should aid in scoring sunflower seed varieties for insect resistance and could also be applied to other applications, such as detecting broken seeds.

Contact: Thomas Pearson, telephone 785-776-2729, e-mail Thomas.Pearson@ars.usda.gov

Methodology for Determining Susceptibility of Rough Rice to *Rhyzopertha dominica* (L.) and *Sitotroga cerealella* (Olivier)

Authors: F.H. Arthur, L. Starkus, C.M. Smith, T.W. Phillips

Submitted to: Journal of Pest Science

J. Pest Sci. (In press).

There are few recent tests that evaluate susceptibility of stored rice to stored-product insects. We evaluated different long grain rice varieties for susceptibility to two major insect pests, the lesser grain borer and the Angoumois grain moth, using different methods. Adult lesser grain borers were first exposed on the rice varieties, then removed. Adult feeding caused the varieties to become more susceptible to larval feeding, which in turn increased progeny production. Some varieties were more susceptible than others to the lesser grain borer. Since adult Angoumois grain moths do not feed, we exposed mating pairs of adults to produce larvae that would infest the rice. All varieties were susceptible to damage caused by larval Angoumois grain moth, including those that did not support lesser grain borer growth and development. Results show that varietal susceptibility to stored-product insects may differ with insect species.

Contact Frank Arthur, telephone 785-776-2783, e-mail Frank.Arthur@ars.usda.gov

Economic Feasibility of Methoprene Applied as a Surface Treatment and as an Aerosol Alone and in Combination with Two Other Insecticides

Authors: E.A. Fontenot, F.H. Arthur, J.R. Nechols, M.R. Langemeier

Submitted to: Journal of Economic Entomology. 106: 1503–1510

Insect growth regulators (IGRs) used alone or combined with other insecticides are being evaluated for control of the Indianmeal moth, a common stored product pest, but there is little research regarding economic feasibility of treatments. We used mortality data from laboratory and field studies to conduct an economic risk analysis of different treatments. The optimal insecticide was a combination of methoprene combined with the pyrethroid esfenvalerate, but more frequent treatment is needed to reduce risk when Indianmeal moth developed on an optimal diet compared to a sub-optimal diet. Results show how risk assessments can be developed to help minimize damage caused by the Indianmeal moth.

Contact Frank Arthur, telephone 785-776-2783, e-mail Frank.Arthur@ars.usda.gov

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

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NDSU Researchers Utilize Q-TOF Technology to Study Mycotoxins in Wheat and Barley

NC-213 scientist **Dr. Senay Simsek**, assistant professor in the Plant Sciences Department at NDSU, has obtained ultra-high performance liquid chromatography quadrupole time of flight mass spectrometry (UHPLC Q-TOF MS) system to investigate occurrence of mycotoxins in grain samples with the collaboration of **Dr. Paul Schwarz**, professor in the Plant Sciences Department at NDSU. The ND Wheat Commission and USDA-AFRI have provided major funding for the equipment purchase and ongoing research. Additional support was from the NDSU Agricultural Experiment Station, the Department of Plant Sciences, and the ND Barley Council.

Fusarium Head Blight (FHB), also known as scab, is an important fungal disease affecting small grains in many of the world's grain producing regions. It has resulted in billions of dollars in quality and yield losses to U.S. wheat and barley producers since the 1990s. FHB infected wheat kernels are referred to as scabby, blighted, or tombstones, based upon visual symptoms. These scabby kernels are often contaminated with mycotoxins, although contamination sometimes occurs in the absence of visual symptoms.

Deoxynivalenol (DON), also known as vomitoxin, is the most common mycotoxin associated with FHB infection of wheat and barley, although nivalenol (NIV) and zearalenone (ZEA) also occur. These compounds show a range of toxicity to humans as well as animals, and as such present food and feed safety concerns. Legislation in the European Union has set the maximum DON limits of 1250 ppb for cereals, 750 ppb for flours, and 500 ppb for bread in order to control dietary intake. The FDA has established advisory limits of 1 and 5 ppm in processed wheat products for human consumption and animal feed products, respectively.

Given the food safety concerns, testing for DON in wheat and barley is now routine in areas impacted by FHB. However, in recent years, researchers have discovered that several structurally related mycotoxin derivatives can be generated by plant metabolism or by food processing. These mycotoxin derivatives are sometimes referred to as "masked" mycotoxins, as they often are not detected in routine tests for DON. This is significant because these masked mycotoxins may still exhibit toxicity, or can be broken down to more toxic forms during food processing or in digestion. As such it is possible that total daily intake of mycotoxins, and associated risk are being underestimated.

The new equipment at NDSU will allow the simultaneous determination of deoxynivalenol, zearalenone, and their major masked metabolites in grain and cereal-based foods. Acquisition of UHPLC Q-TOF MS has improved NDSU researchers' ability to conduct original research on the analysis of mycotoxins from various grain sources, and therefore has improved their capacity to compete for federal funding opportunities. The instrumentation and data generated also are being incorporated into the education and training of students and visiting scientists at NDSU.

