

Grain Quality Newsletter

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

Volume 35:3

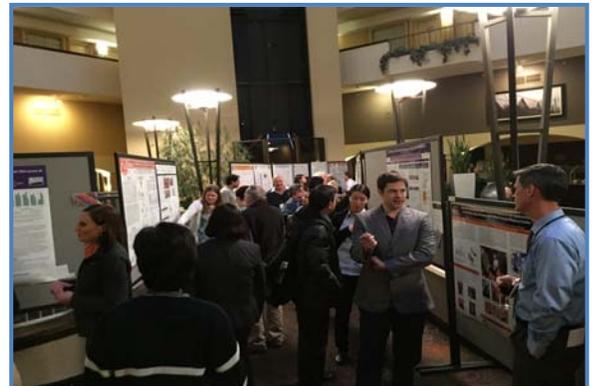
NC-213 The U.S. Quality Grains Research Consortium

Save the Date! NC-213 Annual Meeting 2016 – March 1-2, 2016

Our NC-213 Annual Meeting – 2016 will be held March 1-2 – Austin Convention Center, 500 East Cesar Chavez Street, Austin Texas. We will be joining the Grain and Elevator Processing Society (GEAPS) for a Banquet. GEAPS will provide the guest speaker and the Banquet will include the presentation of the 2016 Andersons Cereals and Oilseeds Award of Excellence and the 2016 Andersons Cereals and Oilseeds Early-in-Career Award of Excellence.

Please contact our office to reserve your presentation slots! We are sure to offer a diverse and full program.

Along with our Technical Sessions and our Industry Panel Discussion, we are offering our second year of our “Posting Showing.” Participants will have the opportunity to show posters on NC-213 related research. Your poster can accompany your presentation or share NC-213 related research (not required – optional). Graduate Students only: We will have a “People’s Choice” Award for the most popular poster. We will have “T” Pins available. Individuals are responsible for getting their poster to the meeting site, hanging their poster, and removing the poster by the time of adjournment on Wednesday, March 2, 2016. (Pictures are from last year’s premier Posting Showing.) Please visit the NC-213 website for updated agendas and for the registration link. Questions? Please contact Bill Koshar.



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.”

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

Bill Koshar
Grain Quality Newsletter
The Ohio State University
OARDC
1680 Madison Avenue
Wooster, OH 44691-4096
e-mail: koshar.3@osu.edu



University of Illinois-Urbana Short Course Announcement

The Agricultural and Biological Engineering Department at the University of Illinois-Urbana will be holding two short courses on **February 1-4, 2016.**

February 1-2: Corn Wet Milling

February 3-4: New Technologies in Ethanol Production

For more information, please contact Kent D. Rausch, Associate Professor, at krausch@illinois.edu or (217) 265-0697. Additional information will be soon posted at www.starchconference.org

The Andersons Research Grant Program: Regular Competition is Closed

In June, our office announced the funding opportunity - The Andersons Research Grant Program – Regular Competition. The competition closed on September 4, 2015. We are excited to announce that eight proposals were submitted. We are working on our Review Committee and hope to soon announce the proposals that were selected to be funded. Thanks to all of the researchers who submitted a proposal.

Latest News from USDA-ARS Center for Grain and Animal Health Research, Manhattan, Kansas

Efficacy of Deltamethrin Against Stored-Product Beetles at Short Exposure Intervals or on a Partially Treated Rice Mass

Kavallieratos, N, K., C. G. Athanassiou, and F. H. Arthur. 2015. *Journal of Economic Entomology* 108: 1416-1421

Abstract

Stored-product insects can potentially be exposed to grain protectants for variable time periods. Adults of three species, the lesser grain borer, *Rhyzopertha dominica* (F.) (Coleoptera: Bostrychidae), the granary weevil *Sitophilus granarius* (L.) (Coleoptera: Curculionidae), and the red flour beetle, *Tribolium castaneum* (Herbst) (Coleoptera: Tenebrionidae) were exposed for 1, 4, 8, and 24 h on brown rice treated with the pyrethroid deltamethrin at the label rate of 0.5 ppm, then removed and placed on untreated rice. Adults of these same species plus the rice weevil, *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae), the maize weevil, *Sitophilus zeamais* Motschulsky (Coleoptera: Curculionidae), and the warehouse beetle, *Trogoderma variabile* Ballion (Coleoptera: Dermestidae) were exposed on treated brown rice mixed with varying amounts of untreated rice to assess progeny production. Immediate and delayed mortality of exposed adults did not exceed 7% for any exposure interval, but progeny production for *T. castaneum* was generally lower in comparison with that for the other species. Increasing the amount of treated rice decreased progeny production of *R. dominica* but not for any *Sitophilus* species. Mixed results were obtained for *T. castaneum* and *T. variabile*. Results show that long exposure times and treatment of an entire rice mass may be necessary to give complete control of stored-product beetles.

(Photo courtesy of: Frank Arthur, USDA-ARS.)

Residual Efficacy of Pyrethrin+methoprene for Control of *Tribolium castaneum* and *Tribolium confusum* in a Commercial Flour Mill

Arthur, F. H. 2015. *Journal of Stored Products Research* 63:42-44.

Abstract

Concrete arenas with and without flour were placed in open, obstructed, and hidden positions inside a commercial flour mill and exposed to a combination treatment of pyrethrin + methoprene. Bioassays were conducted 1, 3, 5, and 7 weeks after the arenas were treated by adding flour to those arenas that were exposed without flour, and then placing late-stage larvae of either *Tribolium castaneum* (Herbst), the red flour beetle, or *Tribolium confusum* Jacqueline DuVal, the confused flour beetle, on an individual arena. There were no differences in adult emergence of either species on any of the exposed arenas in any position for the residual bioassays, indicating no loss of effectiveness of the insecticide. There was less adult emergence of both species on arenas that had contained flour when they were exposed to the aerosol compared to those exposed without flour and then flour added for the bioassay process. Adult emergence of both species was also lower in arenas with flour in the open position compared to those in the hidden and obstructed positions but regardless of exposure position or whether or not the arenas contained flour when they were exposed to the aerosol, adult emergence was greater in *T. confusum* than in *T. castaneum*. Results show how species variability and the presence of structural barriers within a facility can affect susceptibility to aerosol insecticides.



Susceptibility of *Tribolium castaneum* and *Trogoderma variabile* to cold temperatures

Arthur, F. H., K. L. Hartzler, J. E. Throne, and P. W. Flinn. 2015. *Journal of Stored Products Research* 63:45-53.

Abstract

Studies were conducted by exposing different life stages of *Tribolium castaneum* (Herbst), the red flour beetle, and *Trogoderma inclusum* (LeConte), the larger cabinet beetle, for different time intervals to -18°C . Assessments were made of direct mortality to eggs, larvae, and adults, and eventual adult emergence of immatures. Data were described by non-linear equations. The eggs and larvae were the most tolerant life stage of *T. castaneum*. Eight hours of exposure were required for 100% kill of 3–4-day-old eggs and 0–10- and 11–21-day-old larvae, but only 4, 0.5, and 0.5 h respectively were required to completely inhibit adult emergence. For *T. inclusum*, the most tolerant life stage was 15–28-day-old larvae; 64 and 16 h respectively were required for complete mortality and inhibition of adult emergence. Results indicate that *T. inclusum* was the more tolerant species, and specific treatment protocols may be required for different stored product beetle species when using -18°C as a disinfestation strategy.



Latest News from CGAHR continued

Cold Temperature Disinfestation of Bagged Flour

Flinn, P. W. F. H. Arthur, J. E. Throne, K. S. Friesen, and K. L. Hartzler. 2015. *J. Stored Prod. Res.* 63: 42-46.

Abstract

We conducted studies using a commercial freezer maintained at $-17.8\text{ }^{\circ}\text{C}$ to determine the time needed to kill *Tribolium castaneum* eggs in a pallet of flour. Each bag weighed 22.7 kg, and there were 5 bags in each of 10 layers. The dimensions of the pallet were 109-cm wide by 132-cm long by 123-cm tall, and the weight of the stacked pallet was approximately 1152 kg. We conducted tests for nine internal goal temperatures of $-12, -10, -8, -6, -4, -2, 0, 0.1, 3.3,$ and $5.6\text{ }^{\circ}\text{C}$ and were achieved and 4.2 days, respectively. For treatments where the goal temperature for the center of the bag was $8\text{ }^{\circ}\text{C}$, $7 \pm 2.5\%$ of the eggs survived. Our data showed that temperatures that takes place over 24.2 days (cool down goal) resulted in 100% mortality of *T. castaneum* eggs. The reason for the difference in mortality for a static compared to a dynamic temperature treatment may be due to the fact that the dynamic temperature treatment occurs over a much longer duration. The fact that the treatment only required 5.5 days in the freezer before it could be shipped makes it a practical method to disinfest pallets of flour, especially because the bags do not need to be removed from the pallet and no chemicals are used.



(Photo courtesy of: Frank Arthur, USDA-ARS.)

Change of Station: Dr. Kingsly Ambrose



Dr. Kingsly Ambrose, Assistant Professor, Department of Agricultural and Biological Engineering, Purdue University

After serving 3 years and 8 months at Kansas State University, Dr. Ambrose recently moved to Purdue University with the Department of Agricultural and Biological Engineering. He is part of a Purdue College of Engineering Preeminent team on 'Designer Particulate Products'. Team members include Drs. Klein Ileleji (Agricultural and Biological Engineering), Jim Litster (Chemical Engineering), Carl Wassgren (Mechanical Engineering), Zoltan Nagy (Chemical Engineering), and Lynne Taylor (Industrial and Physical Pharmacy). The team's work will focus on a model-based design to produce engineered particles and structured particulate products, develop understanding of process-structure-function relationships for these products, and build capacity through a highly qualified workforce in particulate science and engineering.

Within the team, Dr. Ambrose's research would emphasize the application of particle technology in grain, food, feed and pet food processing. Some of his current research activities include surface characterization of food particles, particle modeling (modeling grain flow in grain dryers; mixing and segregation; size reduction of cereal grains), surface coating of grains/particles, bulk solids flow, and milling and grain processing. Interested graduate students could contact Dr. Ambrose at rambrose@purdue.edu.

Change of Station: Dirk Maier



Dirk E. Maier recently joined Iowa State University as a Professor of Grain & Feed Operations & Processing in the Department of Agricultural and Biosystems Engineering. His applied research and outreach programs will continue to focus on post-harvest engineering, feed technology, stored product protection, grain handling and processing, global food and nutrition security, and continuing education and credentialing of industry professionals in the global grain and feed industry.

He was also appointed as the Associate Director of the Global Food Security Consortium at Iowa State University which aims to promote research, outreach and capacity building that increase the quality and quantity of food and nutrition in the world (www.globalfoodsecurity.iastate.edu). He is the Founding Director of the USAID-funded Feed the Future Innovation Lab for the Reduction of Post-Harvest Loss for which he served as the lead PI.

Prior to joining Iowa State University, he was Professor and Head of the Department of Grain Science and Industry at Kansas State University (2008-2015) where he was responsible for leading the department's teaching, research and outreach programs. He also served as the Director of K-State's International Grains Program Institute and was the senior post-harvest engineer. Dirk has been active in NC-213 since the late 1980s when he attended his first meeting as a graduate student. He will continue participate as part of the Iowa State University team. He can be reached at dmaier@iastate.edu and (515) 294-0140.

International Calendar of Events

November 10-11

"TNO - Whistle Center Short Course: Carbohydrates and food structure design for healthy natural products". Zeist, Netherlands. Contact: Web: www.tno.nl/en/about-tno/calendar/2015/carbohydrates-and-food-structure-design/

November 16-18

"International Conference on Food Chemistry & Technology, FCT-2015". San Francisco, USA. Contact: Laxman Sepuri, FCT-2015 Secretary, United Scientific Group. Tel: + (408) 426 4832/33, Fax: + (408) 426 4869, E-mail: foodchem@uniscigroup.org, foodchem.nano@uniscigroup.org, Web: www.unitedscientificgroup.com/conferences/food-chemistry-and-technology

December 1-3

"Fi Europe & Ni 2015, Food ingredients Europe & Natural ingredients 2015". Paris, France. Contact: Matthias Baur. UBM Live. Tel: + 31 (0) 20-40 95 530, E-mail: matthias.baur@ubm.com, Web: www.foodingredientsglobal.com, www.ingredientsnetwork.com

December 3-4

"FOI 2015, Fats & Oils Istanbul. FGI 2015, Feeds & Grains Istanbul". Ceylan InterContinental. Istanbul, Turkey. Contact: Agripro. Gürcü Kızı Sok. No.33/4 Ortaköy 34347 İstanbul, Turkey. Tel: +90 (212) 236 0345, Fax: +90 (212) 236 0385, E-mail: info@fatsandoilsistanbul.com.tr, info@agripro.com.tr, Web: www.fatsandoilsistanbul.com.tr, www.agripro.com.tr

January 31 – February 5

"26th Annual Practical Short Course on Feeds & Pet Food Extrusion". College Station, TX, USA. Contact: Dr. Mian N. Riaz, Director, Food Protein R& D Center. Texas A&M University, College Station, TX 77843-2476 USA. Tel: +1 (979) 845 2774, Fax: +1 (979) 845 2744, E-mail: mniaz@tamu.edu, Web: www.tamu.edu/extrusion, <http://foodprotein.tamu.edu/extrusion/ShortCourses>

