

CGAHR Update

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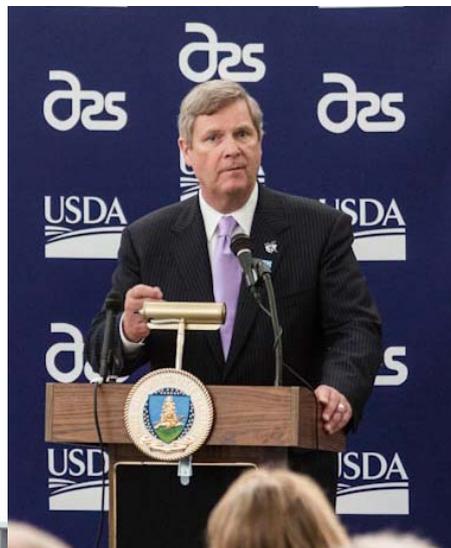
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USDA Agencies in Kansas Celebrate 150 Year Anniversary On April 10, the Center for Grain and Animal Health Research (CGAHR) hosted a celebration of the 150th anniversary of the creation of the United States Department of Agriculture (USDA). President Lincoln signed legislation creating “the People’s Department” in May 1862. The CGAHR is part of the Agricultural Research Service (ARS), one of seven USDA agencies in Kansas that organized the celebration. More than 300 people turned out to hear USDA Secretary Tom Vilsack, Senator Pat Roberts, Congresswoman Lynn Jenkins, and Kansas State University President Kirk Schulz speak at the event. Below are pictures including a ribbon-cutting dedication of our new Wind Erosion Laboratory, where the event was held.



USDA Secretary Tom Vilsack speaking at 150th anniversary event.



USDA Secretary Tom Vilsack and U.S. Senator Pat Roberts cut ribbon on new Wind Erosion research facility.



Research Highlight

Dr. Mark Ruder joined ABADRU in April as a Research Veterinary Medical Officer. Mark was previously at the University of Georgia, where he investigated the potential for an exotic serotype of epizootic hemorrhagic disease virus (EHDV) to infect North American ruminant and vector hosts. One of those studies is highlighted here.

EHDV-7 Infection in White-Tailed Deer:

Epizootic hemorrhagic disease (EHD) viruses are transmitted between hosts by *Culicoides* biting midges and are distributed throughout temperate and tropical regions of the world. Although a variety of wild and domestic ruminant species are susceptible to infection, the outcome varies greatly. For instance, in North America, EHD is one of the most significant diseases of white-tailed deer and high mortality rates have commonly been observed during seasonal outbreaks since the 1950s. This is in contrast to EHDV infection in cattle, which is primarily subclinical, or rarely results in a mild febrile disease. Accordingly, the cattle industry has historically afforded little attention to EHDV, especially in comparison to closely related bluetongue viruses (BTV). However, since 2003, multiple EHD outbreaks in cattle in many parts of the world have renewed interest in these viruses. For instance, in 2006, EHDV-7 was the cause of an intense and widespread EHD outbreak in Israeli cattle. Although mortality was < 1%, a 10-20% drop in milk production resulted in large economic loss for the Israeli dairy industry.

In the U.S., only three EHDV serotypes (1, 2, and 6) are maintained in our *Culicoides* vector-ruminant host system, thus EHDV-7 is considered an exotic virus. Given apparent changes that have been observed in the global epidemiology of EHDV (and BTV) over the past decade, it is important to understand the susceptibility of potential North American hosts to a cattle-virulent EHDV, such as EHDV-7. If EHDV-7 was somehow introduced into the U.S., both susceptible ruminant and vector hosts would be required to maintain the virus in the new ecosystem. Thus, critical native species to investigate include white-tailed deer, cattle, and *Culicoides sonorensis*, the known vector of EHDV in the U.S.

In this particular study, we aimed to determine whether white-tailed deer, a widely distributed and abundant ruminant species, are susceptible to infection with EHDV-7. The results of our experimental infection indicated that white-tailed deer are potential hosts for this exotic EHDV serotype. All six deer in the study developed clinical disease and 67% died. The observed clinical signs and postmortem findings were indistinguishable from the symptoms and lesions observed in white-tailed deer during infection with EHDV (and BTV) serotypes endemic to the U.S. Virus-mediated damage to the lining of blood vessels is the underlying mechanism of the most dramatic findings of this disease, which include fluid accumulation and hemorrhage in many organs and tissues. During the study, common clinical signs included fever, depression, reluctance to rise, red and swollen eyelids (Figure 1), and bleeding tendencies. Postmortem lesions in the deer that died included widespread vascular congestion, as well as hemorrhage and fluid accumulation in the lungs (Figure 2) and chest cavity.

Overall, we demonstrated that white-tailed deer are susceptible to infection and clinical disease with EHDV-7. The fact that disease and postmortem lesions mirrored those caused by endemic serotypes of EHDV and BTV is significant. It reminds us of the importance of investigating suspected EHD and BT outbreaks in white-tailed deer with serotype-specific diagnostic tests. This species is so susceptible to infection with these viruses that deer can serve as a good sentinel species for virus activity. Additional studies have been performed to demonstrate the susceptibility of cattle to EHDV-7 infection and the ability of *Culicoides sonorensis* to transmit the virus, although we'll leave those for another day.



Figure 1. White-tailed deer infected with EHDV-7. Note the red and swollen eyelids.



Figure 2. Lungs from a deer infected with EHDV-7 that died on day 7 post-infection. The lungs are red, heavy, and wet (pulmonary edema and hemorrhage). Note the frothy edema fluid in the opened trachea.

For more information contact: Dr. Mark Ruder
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Meetings/Conferences

Barbara Drolet was chosen to attend the Leadership Kansas program, affiliated with the Kansas Chamber of Commerce, May through Oct. This training program consists of six sessions.

Dana Nayduch was the co organizer and presenter at North Central Branch Entomological Society of America meeting, Lincoln, NE, 6 Mar., of the symposium "Flies, Microbes and Health." Her presentations included "Innate immune responses during fly-microbe interactions: impact on microbe fate and vector potential" and "Summary and Discussion."

Lee Cohnstaedt was invited to speak at the North American Deer Farmer's Association (NADeFA) Annual Conference, Dallas, TX, 14-18 Mar. Dr. Cohnstaedt presented two talks on the application of integrated pest management techniques used in dairy farming and their application to deer farming with the goal of reducing *Culicoides* disease vectors on farms.

Dana Nayduch was invited to speak at the Hunter College of Health and Sciences, in Manhattan, NY, 14-19 Mar., on the topic of vector-borne infections and parasitic diseases.

Scott McVey traveled to Plum Island, NY, with visiting Ukrainian scientists to meet with scientists of the Foreign Animal Disease Research Unit, 26-29 Apr. (see below).

William Wilson attended the Department of Homeland Security's Center of Excellence for Emerging Zoonotic Diseases (CEEZAD) annual meeting, Nebraska City, NE, 1-2 May.

Dana Nayduch gave an invited lecture at Manhattan Area Technical College, Manhattan, KS, on "An Introduction to Parasitology and Vector-Borne Disease," 12 May.

Barbara Drolet traveled to Ft. Collins, CO, 13-29 May, to conduct collaborative animal research at Colorado State University.

Mark Ruder gave invited lectures on orbiviral hemorrhagic disease at the wildlife seminar for emergency animal disease preparedness. He also met with potential collaborators for future *Culicoides* biting midge projects in Athens, GA, 15-27 May.

Scott McVey attended and presented at the American College of Veterinary Internal Medicine Forum. New Orleans, LA, 30 May – 6 Jun.

Visitors

Dr. Andrey-Igor Buzun, Dr. Sergei Filatov, and Dr. Roman Kucheryavenko from the Ukrainian National Scientific Center Institute of Experimental and Clinical Veterinary Medicine in Kharkiv, Ukraine, visited the Arthropod-Borne Animal Diseases Research Unit at the Center for Grain and Animal Health Research in Manhattan, Kansas, on April 24-25, 2012. ARS scientists from Knipling-Bushland U.S. Livestock Insects Research Laboratory in Kerrville, Texas; the Animal Disease Research Unit in Pullman, Washington; and Dr. Dan Strickman of the ARS National Program Office were in attendance. The purpose of the meeting (group photo at right) was to discuss potential research projects in the Ukraine to investigate the role of ticks in transmission of African Swine Fever. The visiting party also traveled to Plum Island, New York, to visit with scientists of the Foreign Animal Disease Research Unit.



Research Highlight

Using Single Kernel Near-Infrared Spectroscopy to Study Fusarium Infection in Wheat:

Fusarium Head Blight (FHB), also called 'scab', is a fungal disease that infects wheat and other grains such as rye and barley. The direct and secondary effects of this disease cause billions of dollars in losses world-wide. In addition to reducing wheat yields, the fungus produces a toxin, deoxynivalenol (DON), which makes infected grain unsafe for food or feed purposes. One of the most effective strategies for managing this disease is the use of less susceptible or resistant wheat cultivars. Developing these varieties has been hampered by the lack of a rapid, non-destructive, and objective method for identifying the fungi and toxin on kernels.

We recently developed a method, which was partially funded by the U.S. Wheat and Barley Scab Initiative, to estimate the percentage of Fusarium-damaged kernels (FDK %) in wheat grain samples using our automated Single Kernel Near-Infrared (SKNIR) System. Using this technique, it is possible to objectively, rapidly and consistently measure FDK % in wheat samples. The SKNIR system will allow wheat breeders to evaluate harvest samples for Fusarium infection rapidly, and non-destructively, speeding up the development of resistant varieties.

We have also developed SKNIR techniques to estimate the DON content in single wheat kernels and bulk toxin levels in small grain samples. Wheat breeders use the FDK % and bulk DON level of grain samples as important parameters in the evaluation of wheat varieties for FHB disease resistance. Determining the pattern of DON distribution among kernels of grain may shed light on the spread of the disease. In addition, study of the DON distribution pattern among DON containing kernels may indicate the extent of DON detoxification or resistance to DON accumulation. When wheat varieties are grown and inoculated under controlled conditions, comparison of single kernel DON distribution patterns among kernels of wheat varieties can provide some clues about their intrinsic FHB resistance mechanisms. For example, the single kernel DON distribution among harvested kernels of varieties Everest and Tomahawk (Figure 1) shows that Everest has more resistance to the spread of FHB disease compared to Tomahawk. When single kernel DON distribution among randomly selected DON containing kernels of these two varieties are compared (Figure 2), it seems that variety Tomahawk shows a higher resistance to DON accumulation compared to Everest. Therefore, these nondestructive, rapid techniques can be helpful to wheat breeders for more comprehensive evaluation of wheat germplasm for FHB resistance and hence streamline the FHB resistant variety development process.

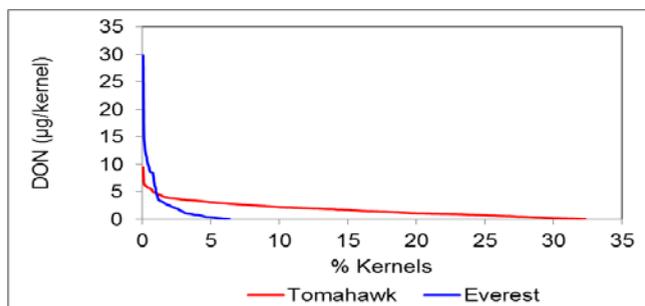


Figure 1. Single kernel DON level distribution in harvested grains of the varieties Tomahawk and Everest.

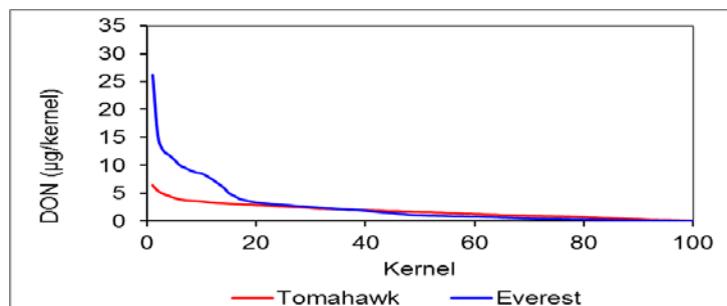


Figure 2. Distribution of DON content in randomly selected DON containing kernels of varieties Tomahawk and Everest.

This newly developed SKNIR technique will allow wheat breeders to rapidly and objectively assess wheat kernels for FHB damage. Because the method is non-destructive, plant breeders can quickly evaluate samples for FHB damage and still utilize the seed for planting and generation advancement. The technique will also be useful to agronomists and plant pathologists as they evaluate fungicides or other FHB management practices to reduce the impact of this important wheat disease.

Research conducted by Drs. Floyd Dowell and KHS Peiris; collaborators included Y. Dong, W. Berzonsky, P.S. Baenziger, S.N. Wegulo, W.W. Bockus. For more information, contact Floyd Dowell, (785) 776-2753, Floyd.Dowell@ars.usda.gov

Meeting/Conferences

Dan Brabec, Tom Pearson, Floyd Dowell and Paul Armstrong attended the Wheat Quality Council annual meeting in Kansas City, MO, 14-16 Feb.

Mark Casada presented two talks, "Moisture Effects During Aeration to Cool Stored Grain and Its Impact on Insects" and "Heat Treatment for Empty Grain Storage Bins -- Floor Temperatures and Insect Response," at the Nebraska Urban Pest Management (UPM) conferences in Lincoln, NE, 14-15 Feb.

John Tatarko and **Larry Wagner** met with stakeholders and discussed wind erosion modeling , Alamogorda, NM, 22-25 Feb.

Mark Casada, Paul Armstrong, and **Dennis Tilley** attended the Grain Elevator and Processing Society (GEAPS) Exchange, Minneapolis, MN 4-9 Mar. Mark Casada and Dennis Tilley gave presentations.

Paul Armstrong gave a presentation at the 53rd Annual Corn Dry Milling conference, Peoria, IL 16-19 May.

Floyd Dowell was invited by Dept. of Agriculture and Food, Western Australia to give a seminar and conduct training on near-infrared spectroscopy to identify agricultural crop pests in Perth, Australia; 11-15 Jun.

Visitors

EWERU scientists held a workshop on WEPS/SWEEP (Wind Erosion Prediction System/Single-event Wind Erosion Evaluation Program) on 11-12 Jan. at CGAHR. Participants included 3 visitors from China, and 2 current PhD students from China, as well as interested students and colleagues from Kansas State University. The Chinese visitors were Yaqin Ji, College of Environmental Science and Engineering, Nankai University; Li Chen, College of Urban and Environmental Science, Tianjin Normal University; and Tao Li, College of Information Technical Science, Nankai University. The PhD students are Benli Liu, Cold and Arid Regions Environmental and Engineering Research Institute, Lanzhou; and Jiaqiong Zhang, Academy of Disaster Reduction & Emergency Management, Beijing Normal University. See photos below.

Mobolaji (Sam) Omobowale, is visiting EWERU from Apr. through Aug. Sam, from Nigeria, received a fellowship award from the Robert S. McNamara Fellowships Program in Washington, D.C. Paul Armstrong is Sam's host while he is in Manhattan.



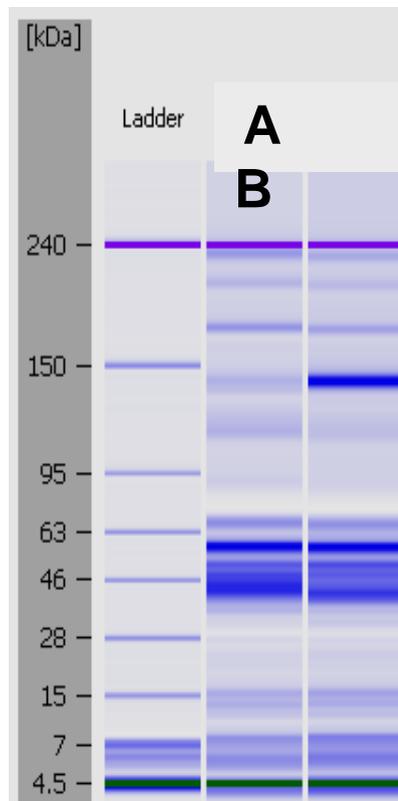
Elizabeth Maghirang (left) and Tom Pearson (right) explain EWERU research to visitors at the USDA 150th anniversary event.

Research Highlight

Understanding and Improving Tortilla Quality:

The tortilla industry is one of the fastest growing segments of the U.S. baking industry with annual sales surpassing \$6 billion. Consumers prefer refined wheat flour tortillas that are flexible, opaque, large in diameter that have a long shelf life. Currently, the tortilla industry uses bread wheat flour and chemical ingredients to achieve the required functionality for tortilla production because requirements for wheat flour tortilla differ from that required for good quality bread. Without modification, hard winter wheat cultivars developed for bread produce poor quality tortillas that are small in diameter and chewy or tough. This is because protein functionality requirements for wheat flour tortilla differ from that required for good quality bread. The desirable gluten protein network for good quality tortilla production is extensible and mellow, while bread dough requires a strong, resilient gluten network to retain air bubbles during fermentation. The goal of this project is to identify the combination of flour proteins and dough making attributes with optimum functionality for tortilla in order to select hard winter wheat breeding lines suitable for tortilla production.

High molecular weight glutenin subunits (HMW-GS) play significant roles in the functional properties of wheat flour. A variety of wheat samples such as HMW-GS deletion lines, recombinant inbred lines and transgenic samples that overexpress specific HMW-GS were compared for dough and tortilla making properties. The specific HMW-GS desirable for producing bread of suitable loaf volume are detrimental to tortilla quality; likewise the amount of insoluble polymeric protein (IPP) is highly correlated with bread loaf volume yet negatively correlated with tortilla diameter and shelf stability. In addition to glutenins, we are dissecting the role of gliadins, the most abundant storage protein in wheat flour. Gliadin proteins are highly polymorphic and the balance between gliadin and glutenin content in flour determine the viscoelastic properties of resulting dough.



Another issue addressed is improvement of evaluation methods of tortilla quality as current methods are subjective and lengthy. The suitability of wheat lines for tortilla production is done by milling the wheat, evaluating the flour and processing it into tortillas. This requires at least 1 kg of flour to do all of the tests and screening is time-consuming, labor-intensive and costly. Developing prediction methods is one approach to make this screening process more efficient. Working with colleagues at Texas A&M University, models to predict tortilla diameter from the mixing time, dough resistance to extension values and insoluble flour protein were developed. These prediction models will be an easy and fast tool for breeders to advance or eliminate wheat lines specifically bred for tortilla production.



For more information, contact: Dr. Michael Tilley
(785) 776-2759, Michael.Tilley@ars.usda.gov

Meeting/Conferences

Brad Seabourn, Richard Chen, Margo Caley, Theresa Sutton, Laura McLaughlin and Tom Herald attended the Wheat Quality Conference in Kansas City, MO, 14-16 Feb.

Jeff Wilson and **Tom Herald** made a presentation to the Lawrence and Topeka Celiac Sprue Chapters on 27 Mar.

GQSRU hosted the 75th Anniversary of the Hard Winter Wheat Quality Laboratory and Dedication of its new milling laboratory on 10 Apr. Approximately 45 guests were present for the event (photo of ribbon cutting for Milling Lab below).

Prini Gadgil and **Jeff Wilson** attended MALS training with Wyatt Technologies in Santa Barbara, CA, 1-3 May.

Michael Tilley attended the Tortilla Industry Alliance meeting in Anaheim, CA, 10-11 May.

Tawanna Ross Johnson attended the GSA Training & Expo in San Antonio, TX, 15-17 May.

Brad Seabourn, Richard Chen, Laura McLaughlin and Rhett Kaufman attended the 2012 Wheat Breeders' Field Day in Burlington, CO, 7 Jun.

Tom Herald, Scott Bean, Deidre Blackwell, Prini Gadgil and Brennan Smith attended the International Food Technologist meeting in Las Vegas, NV, 26-29 Jun.

Visitors

Dr. Candice Gardner, RL/Coordinator, ARS North Central Regional Plant Introduction Station, Ames IA, visited and toured in March. Mr. Romulo Lollato and Thiago Montagner, graduate students of Oklahoma State University professor Dr. Jeff Edwards, visited and toured in April. Dr. Lisa Wilken, Assistant Professor, Kansas State University, Dept. of Biological and Ag Engineering discussed research projects and toured in April. Enrique Payeras, Director of Manufacturing, Molinos Modernos, Honduras, and President of NAMA Latin American; U.S. Wheat Mexico, toured in April. GQSRU hosted the Plains Grains Inc. (PGI) Board of Directors Meeting, 11-12 Apr. Hosted Florentino Lopez, Dusti Fritz and Justin Weinheimer of United Sorghum Check-off Program., and discussed common research interests on 12 Apr. Jeff Wilson meet with Dr. Kochenhaur of Oklahoma State University to discuss research on 27 Apr.



Ribbon cutting ceremony for the new Milling Laboratory. Pictured above (L to R) Tom Herald, Mickey McGuire, Ben Handcock, Mark Hodges, Ed Knipling and Brad Seabourn.

Research Highlight

Pyramiding Resistance Genes Against Ug99 Wheat Stem Rust:

'Ug99' is the term used for a group of highly virulent races of stem rust that emerged in central Africa starting in 1999. Since then, the Ug99 group has spread to South Africa and north to Ethiopia, Yemen, and Iran. Experts expect that it will continue to spread and will eventually reach North America. The threat to the global wheat crop is high because Ug99 is able to defeat almost all of the older resistance genes that have been used to protect wheat from wheat stem rust for the last fifty years.

Several years ago, a global effort was launched to find new sources of resistance to Ug99. Some of that work has been done here in Manhattan as a cooperative project between USDA-ARS and the Wheat Genetic and Genomic Resources Center (WGGRC) at Kansas State University. In some cases, genes have been found in wheat close relatives and the genes were easily transferred to adapted bread wheat lines. In other cases, the resistance genes were derived from distant wheat relatives and carried along some extra genetic baggage that detracts from yield or quality. In response, wheat cytogeneticists have worked to remove the excess baggage by shortening the chromosomal segments that carry the alien genes. Cytogenetic researchers from Australia, USDA-ARS in Fargo, ND, and, of course, Kansas, have all contributed valuable new Ug99-resistant lines. We now have a set of genes that provide good resistance to Ug99.



Figure 1. Wheat stem rust attacking wheat stems. Photo courtesy of USDA-ARS Cereal Disease laboratory.

One thing we have learned through hard experience is that single resistance genes don't last long after you release them because the pathogen can easily mutate and overcome one gene at a time. So our strategy is to release hard winter wheat cultivars that carry more than one gene. Two may be enough, but three genes would probably be much more durable. HHWGRU researchers are working cooperatively with regional wheat breeders to stack two or more new stem rust resistance genes into elite cultivars. These gene stacks are often referred to as pyramids. In the past, it was very difficult to pyramid three genes together in the same cultivar because the genes masked each other. One gene looked almost the same as three as far as we could tell by eye. Luckily, the new resistance genes can all be tested in our genotyping laboratory using molecular markers. We can now identify which lines carry the desired gene pyramid and select only the positive lines for further testing.

Our favorite genes for pyramiding are *Sr22* from the wheat relative *Triticum monococcum*, *Sr26* from *Thinopyrum ponticum*, and *Sr35* from *T. monococcum*. All three genes are effective against Ug99 and are thought to have little or no deleterious effects on yield or quality. In addition, we are planning to include *Lr34* in the pyramid. *Lr34* is a leaf rust resistance slow-rusting gene that has been durable for more than fifty years. Recently it has been shown to be effective against stem rust too. The resulting pyramid should be nearly immune to the Ug99 group and should last many years. In the meantime, we will continue to add to our arsenal of new resistance genes.

For more information, contact Dr. Robert Bowden (785) 532-2368, Robert.Bowden@ars.usda.gov

Meeting/Conferences

John Fellers participated in the NIFA Panel, 28 Feb. – 1 Mar., in Washington, DC. He also participated in the AFRI panel, 2 Apr., in Washington, DC.

Jesse Poland was invited by a collaborator at Colorado State University to be part of a committee meeting to help advise graduate students, 23-24 Apr., in Fort Collins, CO. He was also invited to present research using genotyping-by-sequencing to characterize wheat breeding lines and develop genomic selection models. He attended and presented data at the workshop "Progress and Applications in Next-Generation Sequencing", held 2-5 May, in Saskatoon, Canada.

Visitors

Jarislav von Zitzewitz, from Uruguay visited 20 Feb. Jared Smith, USDA-ARS, Raleigh, NC also visited 20 Feb. Janet Lewis, Bayer Crop Science, Lincoln NE, visited 29 Feb.

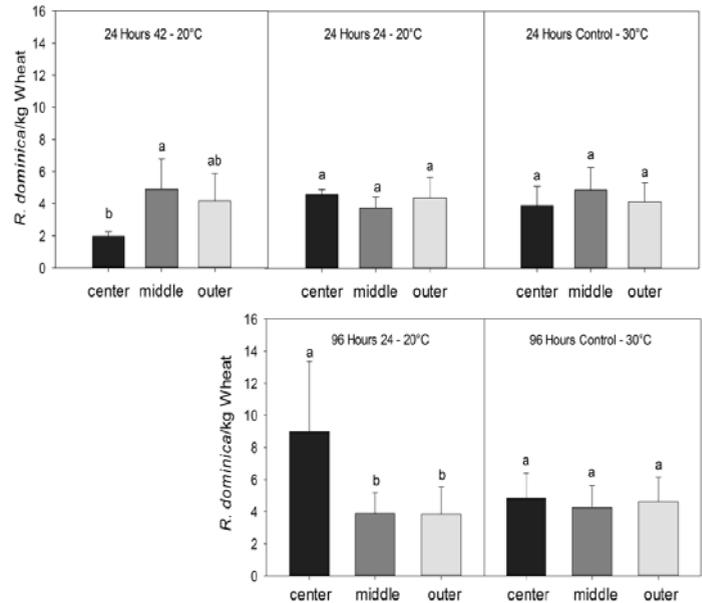
Research Highlight

Movement of Lesser Grain Borer in Response to Temperature Gradients in Stored Grain:

The lesser grain borer, *Rhizopertha dominica* (right), is one of the most common and damaging insect pests of stored wheat in the USA. In the autumn, the periphery of the grain bulk cools faster than the center and this allows grain insects to continue to reproduce in the center. Very little is known about the movement of the lesser grain borer in temperature gradients in stored grain. We studied the movement and temperature preference of the lesser grain borer in a 22-inch diameter cylinder with 3 inch high sides containing 44 pounds of wheat. Two temperature gradients were tested over a 24-hour period.



Beetles preferred the moderate temperature region of the cylinder in a 40 to 20°C gradient, but avoided the highest temperature region. In a 24 to 20°C gradient, beetles did not move very much during the 24-hour period. When a 96-hour duration was used for the 24 to 20°C gradient, there were more beetles in the warmest center region of the gradient compared to the cooler middle or outer regions. Compared to other stored grain beetles, such as the rusty grain beetle, the lesser grain borer appears to move more slowly through the grain into preferred temperature regions. It is possible that adult *R. dominica* may suffer higher winter mortality in grain bins compared to the rusty grain beetle because the lesser grain borer is not able to move quickly enough into the warmer regions of the grain mass as the periphery of the grain cools during the fall and winter months. This could affect the beetle's ability to overwinter in stored grain.



Average *Rhizopertha dominica* density in the center, middle, and outer sections of the arena after 24 and 96 h. Within a figure, bars marked with a different letter are significantly different ($P < 0.05$, REGW Test).

For more information, contact: Dr. Paul Flinn (785) 776-2707, Paul.Flinn@ars.usda.gov (Collaborator: Dr. David Hagstrum)



Meeting/Conferences

Jim Throne attended the International Association of Operative Millers Food Protection Committee meeting in Gainesville, FL, on 6 - 9 Feb. to meet stakeholders and share new ARS research results.

Frank Arthur and **Jim Campbell** met with Dr. Gerald Ducette and other potential collaborators at MRI Global in Kansas City, MO, on 8 Feb. to discuss collaboration on our research with aerosol insecticides. Frank presented the talk "Research with aerosol insecticides to control stored product insects: Simulated field studies." Jim presented the talk "Research with aerosol insecticides to control stored product insects: Field studies."

Frank Arthur and **Jim Campbell** attended the 2012 Nebraska Urban Pest Management Conference in Lincoln, NE, on 14-15 Feb. Jim presented two talks "Pheromones for detection and mating disruption of stored grain pests," and "Biology and habits of red flour beetles and lesser grain borers." Frank presented the talk "Additive effect of insect growth regulators and insecticides against stored grain pests."

Brenda Oppert attended the Advances in Genome Biology and Technology meeting in Marcos Island, FL, on 12-14 Feb. She presented the talk "The insect gut transcriptome: Using gene expression technologies to compare and contrast Tenebrionid beetles."

Brenda Oppert attended the Biotechnology Summit 2012 Congress in Merida, Yucatan, Mexico, on 18-20 Mar. She presented the invited talk "Functional genomics as a tool to study insect responses to Bt intoxication." She met with Russian collaborators on an International Science and Technology Center grant.

Frank Arthur participated in the 17th Grain Elevator and Processing Society / International Association of Operative Millers Conference in Angola, IN, on 28 Mar. He presented two talks "Insecticides in stored grain and mills" and "IPM in stored grain and milling."

Frank Arthur, **Jim Campbell**, and **Karrie Buckman** met with collaborators at Arkansas State University in Jonesboro, AR, and with local rice mill personnel on 15-19 Apr. to initiate research for a new grant from USDA-NIFA Methyl Bromide Transitions Program.

Jim Campbell attended the International Association of Operative Millers Food Protection Committee Meeting in Spokane, WA, 6-9 May, to meet with stakeholders to share ARS research results.

Kris Silver attended the Arthropod Genomics Symposium in Kansas City, MO, 30 May – 2 Jun. He presented the talk "Gene expression in a *Tribolium castaneum* cell line."

Frank Arthur, **Jim Campbell**, **Karrie Buckman**, and **Jim Throne** attended the annual meeting of the North Central Branch of the Entomological Society in Lincoln, NE, 3-6 Jun. Frank presented the talk "Research with industry on developing new insecticide products." Jim Campbell presented the talk "Research on how to evaluate treatment efficacy in food facilities." Karrie presented the talk "Understanding what pheromone trapping data tells us about pest populations." Jim Throne presented the talk "Emerging pests within the food industry."

Grants

Frank Arthur set up a trust agreement between ARS and ProvisionGard Technologies to determine the residual efficacy of ProvisionGard to control stored product insects.



Visitors

The Food Protection Alliance is a network of 20 regional companies that provides pest management, food safety, fumigation and alternatives to fumigation services to the food industry. They held their annual boot-camp meeting on 14 Mar. in Manhattan, KS. This meeting provides education, training and exchange of information in Manhattan, KS. **Jim Campbell** was invited to make a two hour presentation at the meeting on his research related to pheromones and pest management for the food industry. Following the presentation, the group visited **CGAHR** where **Tom Shanower** provided a welcome and presented an overview of CGAHR, **Jim Throne** presented an overview of SPIRU and results of some of his research on management of psocids, **Paul Flinn** presented a summary of his research on movement of gas during phosphine fumigations and modeling red flour beetle populations in mills, and **Frank Arthur** gave a tour of his laboratory and a walking tour of the research facilities at the CGAHR.

Mr. Doug VanGundy, a representative from Central Sciences International, visited with **Frank Arthur** and **Jim Throne** on 9 May. New cooperative projects concerning insect pest management in stored products were discussed.



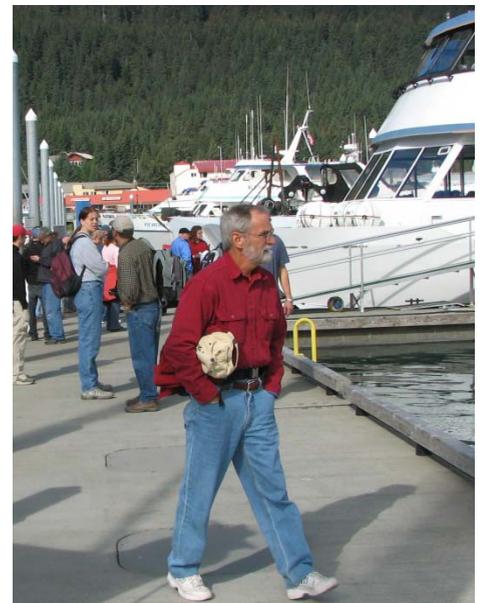
Jim Campbell explains SPIRU research at the USDA 150th anniversary event.

Retirement

Dr. Jeff Lord (lower right), Research Entomologist, retired after 14 years with ARS in the Stored Product Insect Research Unit. Jeff earned degrees from Lafayette College, the University of Maine, and M.S. and Ph.D. degrees from the University of Florida. He was a Postdoctoral Associate at the Boyce Thompson Institute for Plant Research in Ithaca, NY, from 1982-84, and from 1984-86, was seconded to the National Rice and Bean Research Center in Brazil where he directed a group that explored the microbial pest control of insects in beans and cowpeas and trained graduate students and scientists. Jeff returned to Gainesville, FL, as an ARS Research Associate from 1987-91, working to develop a gradual release formulation for a bacterial pathogen of mosquitoes.

From 1991 to 1998, he worked in industrial development of mycoinsecticides at EcoScience Corp. in Worcester, MA, and at Mycotech Corp. in Butte, MT, where he conducted and contracted laboratory and field work for development of two mycoinsecticide products. Jeff joined SPIRU in 1998, and investigated synergism between microbes and other control technologies to increase effectiveness. He discovered synergism between the fungus *Beauveria bassiana* and desiccant dusts for control of beetle pests of stored products. He discovered that fatty amides on the cuticle of psocids interfere with the attachment of pathogenic fungi. Fatty amides were not previously known to occur on insect cuticles, and this was the first documentation of an insect defense against the attachment of pathogenic fungi. He also demonstrated with several grain insects that mycoinsecticides are often more efficacious in low moisture conditions that prevail in stored products. This research dispels the myth that mycoinsecticides are efficacious in wet environments only. He also discovered several new pathogens of stored-product insects. Jeff served in several editorial roles for the journals *Mycopathologia* and *Environmental Entomology*, and was very active in leadership for the Society for Invertebrate Pathology.

During retirement, Dr. Lord and his wife, Karen, plan to spend winters in Florida, and the rest of the year in Maine. Retirement will afford him the opportunity to spend more time sailing off the coast of Maine.



Center News

Personnel News:

Over the past few months there have been a number of personnel changes at CGAHR. Here are the 'comings' and 'goings.'

Arrivals:

Guy Hallman joined SPIRU as a Research Entomologist.

Robert Pfannenstiel joined ABADRU as a Research Entomologist.

Sam Omobowale joined EWERU as a Visiting Scientist from Nigeria.

Mark Ruder joined ABADRU as a Veterinary Medical Officer.

The following joined as Bio Science or Engineering Aides: **Neil Baker** (EWERU), **Christopher Shultz** (EWERU), **Matthew Lee** (ABADRU), **Konner Cool** (SPIRU), **Alexa Ukena** (ABADRU), **Jennifer Glenn** (ABADRU), **Ashley Brown** (GQSRU), **Sam Rice** (GQSRU), and **Ryan O'Neill** (EWERU).

Brian Snodgrass joined as a Student Intern (Facilities).

Agnes Wojnar joined ABADRU as an Office Assistant.

Julia Cremer is visiting GQSRU from the University of Queensland in Australia.

Departures:

Jeff Lord, Research Entomologist in SPIRU (see pg 11).

Mike Rickenbrode, Maintenance Mechanic.

Matt Kucharski, Bio Science Aide in EWERU.

Kyle Schweisthal, Bio Science Lab Technician, ABADRU



Photos at right from 150th Anniversary celebration: Upper – Presentation of the colors by the Fort Riley Commanding General's Color Guard of the U.S. Army. Lower- Senator Pat Roberts introducing USDA Secretary Tom Vilsack.

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