

# CGAHR Update

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## Spring 2013

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### **Dr. Mark Casada Receives Andersons Cereals and Oilseeds Award of Excellence**



Dr. Mark Casada (left), 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 13 February 2013 in Kansas City, Missouri.

### **Dr. Jim Throne Leaves CGAHR for Center Director Position in California**

Dr. James Throne (right) was selected to be the Center Director of the USDA-ARS San Joaquin Valley Agricultural Sciences Center, Parlier, CA, effective April 7, 2013. Prior to the appointment Jim had been the Research Leader of the Stored-Product Insect Research Unit at the Center for Grain and Animal Health Research (CGAHR) in Manhattan, KS, where he led a team of seven scientists working on both basic and applied aspects of stored-product entomology. Jim joined ARS in 1985 in Savannah, GA, and was transferred to the CGAHR in 1994. He had been Research Leader since 1997.



We appreciate Jim's service at CGAHR and wish him success in his new assignment!

## Research Highlight

### Comparison of RVF MP-12 replication in domestic livestock and wildlife cell lines of North America

Dr. Bob Pfannenstiel joined ABADRU in June 2012 after the closure of the Subtropical Agricultural Research Center in Weslaco, Texas. While in Weslaco, Bob studied the ecology of agriculturally important predators including nocturnally active spiders, as well as the potential of spiders in citrus to control the Asian Citrus Psyllid, the vector of citrus greening disease, in dooryard citrus. A major focus of his research was the utilization of non-prey resources (pollens, extrafloral nectars and insect produced honeydew) by spiders.

Since arriving in Manhattan, Bob has initiated several projects on culicoid vectors of animal diseases, particularly Bluetongue Disease and Epizootic Hemorrhagic Disease (EHD) of livestock and deer. These projects fall in three general areas: 1) characterizing the culicoid complex in areas of the USA where Orbivirus epidemics occur with the goal of identifying species complexes, determining their habitat associations and evaluating the vector competence of candidate culicoids; 2) evaluate specific tactics for mitigating culicoid impacts, including but not exclusive to pesticides; and 3) investigate the ecology and behavior of *Culicoides* spp. with the goal of identifying new strategies for vector control. Studies on *Culicoides* ecology will focus on species specific interactions with their breeding habitats and food resources, including foraging and development of larvae.

Little is known of the ecology and behavior of the *Culicoides* complexes in the central and eastern United States and which species might be the important vectors of EHD. *Culicoides sonorensis* is known to be a vector of EHD but is rarely found east of the Missouri River, tends not to be associated with deer and is unlikely to be responsible for the severe outbreaks of EHD in this region. Identification of the common species of *Culicoides* and determining which ones are responsible for transmission of EHD are critical if we hope to manage or mitigate EHD impact on deer farms and understand why the virus sometimes affects cattle herds. Studies on field populations of *Culicoides* were begun in March and field samples of mud from both a deer farm N. of Topeka and stock ponds associated with rangeland SW of Wabaunsee (photos at right) have both yielded overwintering *Culicoides* spp. Once the *Culicoides* complexes are known, candidate species will be evaluated for competency to vector EHD. Once we have a better idea which culicoids are the important vectors of EHD we can more seriously look at on-farm strategies to manage disease vectors.

Studies have been initiated in several other areas as well. A collaborative project with ARS and Kansas State University scientists will examine the interactions between *C. sonorensis* and the bacteria in their breeding habitats. The composition of the bacterial complex may affect fly fitness and vector competence and lead to novel management tactics. Evaluations of candidate pesticides as a management tool for *C. sonorensis* adults are also underway.



Fig. 1. Stock ponds in Wabaunsee County, Kansas.



For more information contact: Dr. Bob Pfannenstiel (785) 776-2799, [Bob.Pfannenstiel@ars.usda.gov](mailto:Bob.Pfannenstiel@ars.usda.gov) .

## Meetings/Conferences

**Scott McVey, Lee Cohnstaedt, and Dana Nayduch** attended the Entomological Society of America Annual Meeting in Knoxville, TN, 10-15 Nov. Dana and Lee co-organized the symposium "If the Epi Triad is Host, Pathogen and Environment, Where Are the Vectors?".

**Dana Nayduch** attended the S1030 Multistate Research Project meeting "Flies impacting livestock, poultry and food safety" in Baton Rouge, LA, 7-10 Jan.

**Dana Nayduch** participated in the ARS workshop 'Big Data and Computing: Building a Vision for ARS Information Management', 5-7 Feb. in Beltsville, MD.

**Robert Pfannenstiel** presented two invited talks "Omnivory in spiders and the potential role of spider chemoreception in conservation biological control" and "Habitat manipulations to increase parasitism of leafrollers and broader landscape influences on the predator complex in apples" at the 4<sup>th</sup> International Symposium on Biological Control of Arthropods, Pucon, Chile 3-7 Mar.

**William Wilson** traveled to South Africa, 3-16 Mar. to participate in two cooperative Rift Valley fever (RVF) vaccine and challenge infection trials.

**Scott McVey** and **Lee Cohnstaedt** presented research and discussed future collaborative plans at the North American Deer Farmer's annual meeting in Cincinnati, OH on 14-17 Mar. Also in attendance, **Darren Snyder**, lead Technician on the current project, met with collaborators to provide information.

**William Wilson** traveled to Urbana, IL on 26-28 Mar. to make an invited presentation entitled "One-World One Health Approaches to Arboviral Diseases" in the Department of Pathobiology, College of Veterinary Medicine, University of Illinois.

**Scott McVey** traveled to Plum Island, NY, to participate in the African Swine Fever Workshop 3-5 Apr. The objective was to conduct a gap analysis of the scientific information and countermeasures to prevent, control, and when feasible, eradicate African Swine Fever and establish a Global ASF Research Alliance.

## Visitors

Dr. Fan Lee, a scientist from the Animal Health Research Institute, Taiwan, visited the Unit from Nov. through Feb. to observe and study the process of colony maintenance of biting midges.

Dr. Fatih Barut, a scientist from Virological Diagnosis Lab., Etlık Central Veterinary Control and Research Institut, Kecioren, Ankara, Turkey, visited the Unit Jan. – Feb.



## Research Highlight

### Development of moisture monitoring cables in grain bins to improve quality

Substantial grain loss occurs every year as a result of improper storage moisture. This can be caused by inadequate drying, localized moist spots and moisture leakage into a bin. High moisture grain can eventually lead to heating of the grain due to mold respiration. Traditional instrumented in-bin monitoring of grain has been done using temperature cables to detect these adverse conditions commonly called 'hot spots' by measuring temperature at multiple points throughout the grain mass.

A new technology to measure grain moisture was developed in cooperation with a commercial company. This technology uses small relative humidity and temperature sensors attached to a cable similar to temperature cables. Relative humidity and temperature data is used to predict moisture using established equilibrium moisture equations for different grain types.

In addition to detecting storage moisture conditions these cables can be used to monitor in-bin drying to achieve precise target moisture levels and maintain these levels throughout the storage period. Additional research has resulted in methods to produce more accurate equilibrium moisture relationships resulting in the ability to predict moisture to within 1% of the true moisture content.

The cost of moisture cables is more than traditional temperature cables but provides much more information, namely temperature, relative humidity and moisture content. The cables are particularly useful for grains whose quality is sensitive to moisture such as rice and popcorn, as well other crops where moisture can significantly affect quality, i.e. corn and soybeans.



Fig. 1. Miniature digital humidity and temperature sensor (3 x 3 x 1.1 mm) used to predict grain moisture.

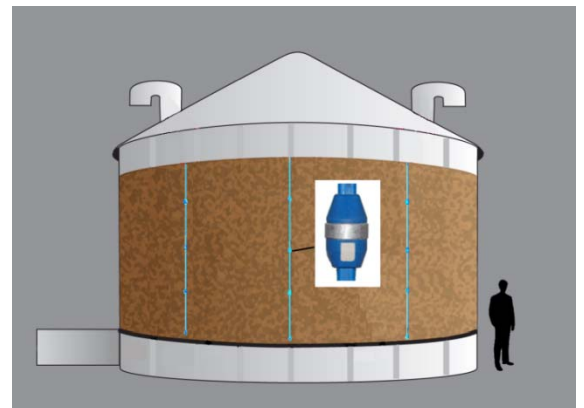


Fig. 2. Moisture sensing cables strategically placed in the grain mass to measure moisture throughout the storage period.



Fig. 3. Commercial moisture cable using relative humidity and temperature sensors. Sensing nodes can be placed at variable positions along the cable length.

For more information contact: Dr. Paul Armstrong (785) 776-2728, [Paul.Armstrong@ars.usda.gov](mailto:Paul.Armstrong@ars.usda.gov) .



## Meetings/Conferences

**Mark Casada, Paul Armstrong, and Dennis Tilley** attended the North Central-213 Annual Meeting in Kansas City, MO, 12-14 Feb. NC-213 is a multi state research project established to provide scientific knowledge/solutions to issues related to quality and marketing of grains and oilseeds.

**Dennis Tilley** attended the Nebraska Urban Pest Management Conference in Lincoln, NE, 12 Feb. He presented results of his research conducted at CGAHR as part of his PhD program of study at Kansas State University.

**Floyd Dowell** attended the Wheat Quality Council annual meeting in Kansas City, Mo, 12-14 Feb.

**Mark Casada** attended the Grain Elevator and Processing Society (GEAPS) Exchange in Louisville, KY, 23-26 February. 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, 27 Feb.-1 Mar. 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.

**Tom Pearson** traveled to St. Louis, MO, 15-17 Apr. to visit with Monsanto Company to work with his sorting technology to sort corn kernels by shape, texture, and color technology.

**Larry Wagner** traveled to Arlington, VA, 28-29 Apr. to attend the In-Progress Review for his Strategic Environmental and Resources Develop Program grant. He reported on his "Measurement and modeling of fugitive dust from off-road Dod Activities" project.



## Visitors

Chris Evans, Department of Infectious Diseases, University of Georgia, received training on using NIRS to detect Filariasis infected mosquitoes 22-25 Jan.

Joel Poore, Wind Erosion Specialist, from Natural Resources Conservation Service (NRCS) visited 19-22 Feb. to meet with Larry Wagner and Fred Fox to discuss NRCS's use of WEPS.

Kirby Rogers, Santisouk Hopkhop, and Nang Hopkhop from XP Trading Company, Laos, visited 16-17 Apr. to receive training on US grain marketing and storage technology.



## Research Highlight

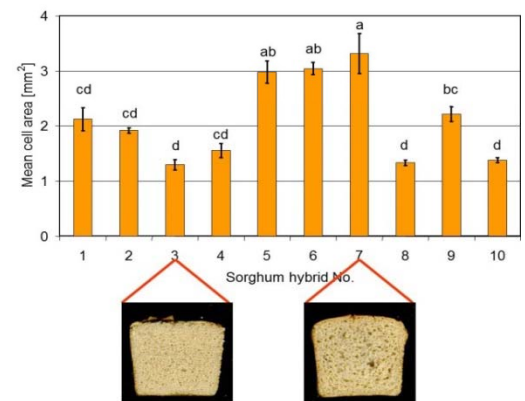
### Sorghum-based foods

Sorghum is the 5<sup>th</sup> largest production crop in the United States and grows well in areas of limited water. Sorghum has unique properties that give it potential for use in a wide range of applications including human foods, human health, and in bio-industrial products. Many consider sorghum an underutilized crop with a bright future.

Sorghum is a gluten-free grain that may be milled into flour and used by people that are gluten sensitive and unable to consume foods prepared from wheat, barley, or rye. Some sorghum types, sometimes referred to as 'specialty' sorghums (such as tannin containing lines and black seeded lines) have potential in the functional food/nutraceutical markets.

To support the use of sorghum in the production of wheat-free foods our research group has conducted research on sorghum breads, noodles, tortillas, rolls, waffles, and beverages such as tea and beer. Some of this research has been conducted in collaboration with Dr. Fadi Aramouni in the Food Science Institute at Kansas State University as well as scientists in Ireland and Italy.

For the production of sorghum breads, the research group developed a standard baking protocol based on a formula containing 70% sorghum flour and 30% corn starch. A method to standardize the water level was developed based on measuring batter thickness. This allowed the group to compare the bread making potential of 10 different sorghum lines to check for intrinsic variability in the sorghum lines that may positively or negatively impact bread making quality. This research found that grain kernel hardness significantly impacted bread quality, through its influence on starch (a constituent of the grain) damage. Bread formulated with flour from harder sorghum grains had higher levels of starch damage and resulted in a coarser, open crumb grain compared to bread formulated with flour from softer sorghum grains. Sorghum grain hardness has been found to be an important end-use factor for the production of sorghum based tortillas.



The proteins of sorghum are not capable of forming dough. Because of this, starch plays an important functional role in sorghum breads. Our research discovered that producing sorghum bread via a sourdough process resulted in a product with better crumb structure. This is most likely due to degradation of the proteins which led to a stronger starch gel in the bread.

As mentioned above, some sorghum types offer application in functional foods due to the presence of health promoting compounds found in sorghum bran. Some types of sorghum contain phenolic compounds in the bran that are very high in anti-oxidant capacity. Research has shown that phenolic compounds may reduce the prevalence of many oxidative stress related diseases including inflammation, cardiovascular disease, cancer, and aging-related disorders. Bread and tortillas made with sorghum bran containing high levels of anti-oxidants were formulated to take advantage of the health promoting compounds intrinsic to the bran.

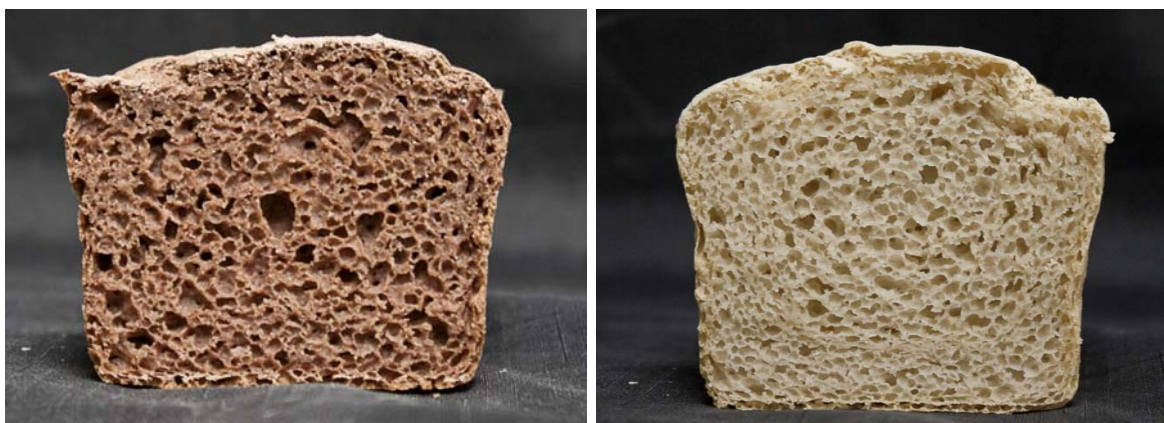


Fig. 1. Sorghum bread made with (left) and without (right) added sorghum bran.

## Research Highlight cont.

Adding sorghum bran to bread increased the overall fiber and vitamin content. Furthermore, the food products may offer enhanced health benefits by selecting specific sorghum hybrids with high anti-oxidant capacity. The group was able to incorporate up to 14% sorghum bran into sorghum based bread without decreasing the crumb structure or loaf volume. The result was bread with 40% higher fiber and 6 fold increase in antioxidant capacity.

Similar research is under way looking at adding high tannin sorghum flour to wheat tortillas. The incorporation of specialty sorghum bran and flour has potential for use both in gluten-free and wheat-based foods.



Fig. 2. Wheat tortillas made with (left) and without (right) added sorghum flour high in anti-oxidants.

For more information, contact: Dr. Scott Bean  
(785) 776-2725, [Scott.Bean@ars.usda.gov](mailto:Scott.Bean@ars.usda.gov)

## Meeting/Conferences

**Tom Herald** attended the Kansas Commodity Classic held in Manhattan on 16 Jan.

**Brad Seabourn, Richard Chen, Margo Caley, Theresa Sutton, Laura McLaughlin, Alicsa Mayer and Tom Herald** attended the annual Wheat Quality Council meeting held in Kansas City, MO during 13-14 Feb.

## 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."

## Visitors

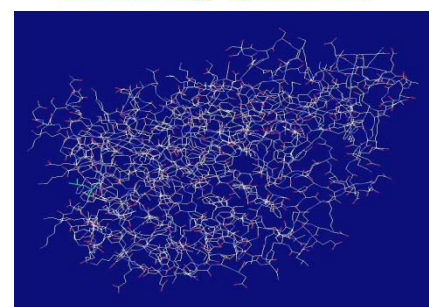
Seventy-eight visitors toured and discussed sorghum and wheat research. Visitors included: 30 Iowa State University Biological and Agricultural Engineering students on 9 Nov.; Scott Baker, Food Technologist with ConAgra 14 Nov.; John Lawton, Senior Scientist, and Steve Lewis, Senior Director, of Technology and Innovation from Poet Industry; Seventeen KSU Grain Science & Industry graduate students in Dec.; Dr. Rick Dempster, American Institute of Baking on 5 Dec.; Pingping Zhang and Tom Jondiko graduate students from Texas A&M University the week of 10 Dec.; Dr. Gary Hou, Technical Director of the Wheat Marketing Center, toured the MU and discussed research on 11 Jan.; Earl Roemer, President of NuLife Market on 15 Jan.; Dr. Gail Wilson of Oklahoma State University on 22 Jan.; Dr. Jane Bowers, Emeritus Department Head of Foods and Nutrition, Kansas State University on 24 Jan.; Dr. Fadi Aramouni, Professor, Kansas State University on 30 Jan.; Sam Rosenan, Dan Moore and David Martin of National Manufacturing, Lincoln NE on 7 Feb.; Takahiro Verno of Nippon Flour Mills on 11 Feb.; Kurt Kortorax, Sal laquez and Kristen McCarthy of CWB on 11 Feb.; Dr. Hulya Dogan, Professor, Kansas State University and Dr. Jane Bock University of Guelph, Canada on 15 Mar.; Dr. Fei Gao, Director of the Protein Production Group at the University of Kansas on 21 Mar.; James Zenner, JPZ Consulting Group, and David Neuwirth, President, Neuwirth Consulting Group on 25 Mar.; Tim Birkel, Commercial Director, USA for NuSeed on 26 Mar.; Dr. Brennan Smith of the University of Alaska on 26 Mar.; Mark Hodges, CEO of PGI on 27 Mar.; Dr. Kwaku Gyebi Doudu University of Pretoria, Republic of South Africa on 29 Mar.; Dr. Sajid Alavi, Professor, Kansas State University on 29 Mar.; Dr. Ghizlane Diria, a wheat breeder from Morocco on 4 Apr.; Edson Csipai and Valdemir da Silva Bunge Representatives from Brazil on 9 Apr.; and Dr. Craig Morris, ARS-Pullman on 9 Apr.

## Research Highlight

### Sequencing the Wheat Leaf Rust Genome

The ancient Romans would celebrate Robigalia on April 25th each year. This was the time of year when their crops, including wheat, would be most sensitive to damage to fungal pathogens. The Romans would offer sacrifices to Robigo, the god of fungal rusts, and pray that their grains would be spared. Like the Romans, US wheat farmers are still dealing with the rusts. Each year leaf, stripe and stem rust threaten yield and crop quality of wheat grown in the Central Great Plains and all over the world. New varieties are released by public and private wheat breeders having new rust resistance genes, but after several years, the resistance breaks down. Researchers in the Hard Winter Wheat Genetics Research Unit in Manhattan, KS are identifying new genetic sources of resistance for wheat breeders, but also understanding how leaf rust interacts with wheat and overcomes resistance.

John Fellers and Myron Bruce, USDA-ARS molecular biologists, have teamed up with the Broad Institute at the Massachusetts Institute of Technology, the USDA Cereal Disease Lab in St. Paul, Minnesota, and Agriculture and Agri-Food Canada to sequence the genome of leaf rust. The fungus has close to 15,000 genes in the 130 million letters of DNA. But why is this important? Nearly 100 races of leaf rust are found each year, some of which are new isolates. Change in an organism comes from mutations and rearrangements in its DNA during sexual recombination. However, the leaf rust fungus does not have a sexual cycle and so the DNA genome sequence is being used to understand how the genetic changes are occurring. Drs. Fellers and Bruce are using next generation technology to sequence different races of the leaf rust fungus to find the changes associated with a race being able to overcome a wheat rust resistance gene. Over 100 races are being sequenced through the genome project and already two proteins have been identified as candidates responsible for the resistance shift. The goal of this work is to develop more durable disease resistance to cereal rusts.



Upper photo: Wheat leaves showing susceptible and resistant reactions to the leaf rust fungi.  
Lower photo: A three dimensional representation of a leaf rust fungal protein involved in overcoming resistance in the plant.

For more information, contact Dr. John Fellers (785) 532-2367, [John.Fellers@ars.usda.gov](mailto:John.Fellers@ars.usda.gov)

## Meeting/Conferences

**Jesse Poland** was invited by Pioneer Hi-Bred International, Inc. in Johnston, IA to present research and a talk titled "Accelerating wheat breeding using high-throughput genotyping and phenotyping" on 5-6 Nov., and gave the same presentation in St. Louis, MO, 6-8 Nov.

**Robert Bowden** served on an RPES panel in St. Louis, MO, 27-28 Nov.

**Guihua Bai** attended the National Fusarium Head Blight Forum in Orlando, FL, on 3-6 Dec.

**Jesse Poland** was invited to Chicago, IL to give a presentation titled "Genomic selection in wheat breeding using genotyping-by-sequencing", dates of travel were 4-6 Dec.

**Guihua Bai, Robert Bowden, John Fellers and Jesse Poland** attended the Plant and Animal Genome Conference in San Diego, CA on 11-16 Jan.

**Jesse Poland** traveled to Ottawa, Canada, to present research on the use of genotyping-by-sequencing for genomic selection approaches in oat breeding on 6-9 Mar.

**Jesse Poland** was an invited speaker for the 6<sup>th</sup> annual University of Minnesota Plant Breeding Symposium, in St. Paul, MN, 24-25 Mar.



## Visitors

Eric Jackson and Ryan Brown from General Mills visited on 13 Nov.; Mandy Christopher from the government of Queensland Australia visited 13 Nov.; Xiaofei Zhang from the University of Minnesota visited on 26 Nov.; Derick Jiwan from Washington State University visited on 12 Dec.; Professors Jizheng Jia and Lifeng Gao from the Chinese Academy of Agricultural Sciences, Beijing, China, visited the 28 Feb. – 2 Mar. to learn high-throughput SNP Genotyping and discuss possible collaboration. Drs. Stan Cox and Shuwen Wang from The Land Institute, Salina, KS and five scientists from Yuennan Province, China, visited 26 Mar. to learn high-throughput marker analysis technology. Dr. Ghizlan Diria, a wheat breeder and Borlaug Fellow from Morocco, visited 11-15 Mar. and conducted collaborative research on mapping of rust genes in Morocco wheat.

# SPIRU News

## Research Highlight

### Using RNA-Seq to Understand Phosphine Resistance in Stored-Product Insects

Phosphine is used worldwide as a fumigant to control pest populations in commodities such as stored grains and grain products. The continued use of phosphine fumigants is critical because of the phase out of the ozone-depleting fumigant methyl bromide. However, reports of phosphine-resistant insect populations are urgently promoting the need to understand the molecular bases for phosphine resistance. Recent studies indicate a substantial increase in phosphine resistance over the past 21 years in major wheat insect pests in the U.S., with levels of resistance approaching those reported for stored grain insect species in other countries. Studies suggest that insect populations with lower carbon dioxide production display higher resistance to phosphine, indicating that lower respiration rates are associated with the physiological basis of phosphine resistance by reducing fumigant uptake in resistant insects. In addition, two molecular markers have been associated with phosphine resistance.

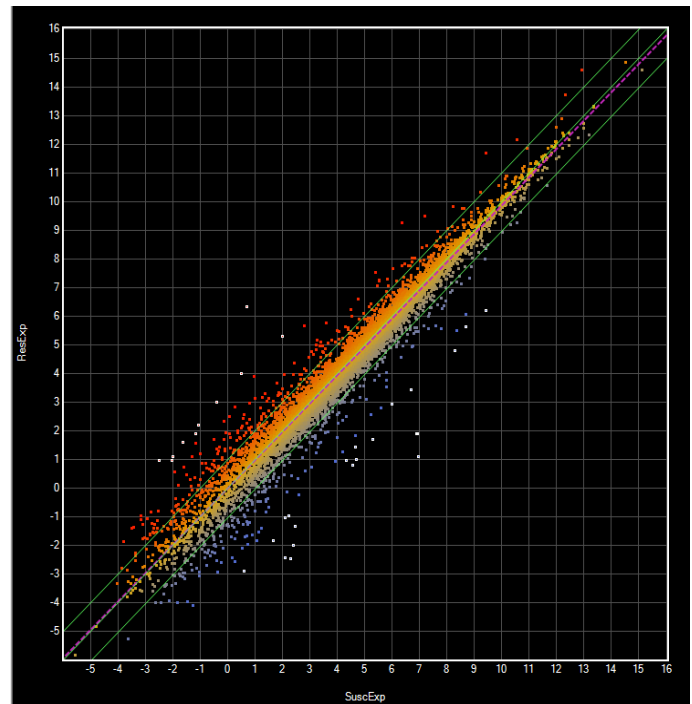


Fig. 1. Scatter plots are used to compare the expression levels of different transcripts in susceptible (SuscExp, x axis) versus resistant (ResExp, y axis) insects exposed to phosphine. White dots represent transcripts that are more than 8-fold changed in expression ( $\geq 90\%$  C.I.). Similar comparisons were done with insects not exposed to phosphine (data not shown).

## Research Highlight cont.

Working with researchers at Kansas State University, Oklahoma State University, North Carolina State University, and the Federal University of Vicosa, Brazil, Dr. Brenda Oppert is applying new sequencing technologies to phosphine resistance research. A gene expression methodology called “RNA-Seq” is being used with U.S. and Brazilian phosphine-resistant populations of the red flour beetle, *Tribolium castaneum*, and the lesser grain borer, *Rhyzopertha dominica*. In RNA-Seq millions of genetic transcripts from susceptible and resistant strains of each insect, exposed or not to phosphine, are obtained using high throughput sequencers. Using sophisticated bioinformatic analyses, RNA-Seq can identify genetic transcripts that are differentially expressed in an insect population, pointing the finger at possible genes that may be involved in resistance. While the genome of *T. castaneum* has been sequenced and provides a “gene map” in these analyses, the genome sequence for *R. dominica* is incomplete and presents challenges in analyzing sequences. Validation of suspect genes is being accomplished by RNA interference, which can decrease gene expression. In addition, we are combining biochemical and bioassay methods to examine critical enzymes related to respiration and metabolism in phosphine-susceptible and resistant insects. Thus far, the data indicate that novel genes are associated with phosphine-resistant populations. Phosphine resistance threatens the economical control of storage pests, and these studies are helping us to understand the molecular differences in resistant insect populations so that we can develop effective resistance-management strategies.

For more information, contact: Dr. Brenda Oppert (785) 776-2780, [Brenda.Oppert@ars.usda.gov](mailto:Brenda.Oppert@ars.usda.gov)

## Meeting/Conferences

**Jim Campbell** attended the Annual International Research Conference on Methyl Bromide Alternatives and Emissions Reductions and the USDA, ARS NP308 Scientists meeting, held in Orlando, FL, November 6-8. Dr. Campbell presented the invited talks “Spatial pattern in aerosol insecticide deposition in a flour mill” and “Evaluating structural fumigation efficacy in rice mills.”

**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. 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 esfenfalerate 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”.

**Brenda Oppert** attended the Advances in Genome Biology & Technology (AGBT) meeting in Marcos, Is, FL on Feb 19-25, 2013. Dr. Oppert presented a poster titled: “Using RNA-Seq to understand phosphine resistance in two stored-product beetles.”

## Meeting/Conferences cont.

**Frank Arthur** attended the Minnesota Structural Pest Management and Minne Food Plant Pest Management Conferences in St. Paul, MN, March 4-5, 2013. Dr. Arthur presented two invited talks: "Residual efficacy of aerosol insecticides," and "Sanitation and insect pest management".

**Frank Arthur** and **Jim Campbell** traveled to Jonesboro, AR, April 2-5, 2013, to meet with collaborators from Arkansas State University to discuss progress updates on their grant objectives.

**Frank Arthur** attended the quarterly meeting of the Food Protection Committee and presented an invited talk at the annual meeting of the International Association of Operative Millers in Niagara Falls, Ontario, Canada, April 28, 2013 to May 3, 2013,. Dr. Arthur presented the talk, "Grain protectants and management of Stored Product Insects."

## Grants

**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.

**Jim Campbell** submitted a trust agreement with TRECE Inc. When approved and activated, he will receive \$60,661 over the next two years to evaluate new trap designs and attractants to improve the monitoring of stored-product insects in food facilities, and to develop and evaluate mating disruption systems for stored-product pest insects.

## Visitors

**Bill Lingren**, president of Trece Inc., visited Jim Campbell on Feb. 8 2013 to discuss collaborative research projects to evaluate new traps and attractants.

**Dr. Paul Fields**, a stored-product entomologist with Agriculture and Agri-Food Canada in Winnipeg, Manitoba, visited with Jim Campbell, Karrie Buckman, Frank Arthur, Paul Flinn and Jim Throne during the week of February 25 – March 1, 2013 to discuss ongoing and future collaborative research projects

**Dr. Scott W. Myers**, entomologist at the USDA-APHIS-PPQ-CPHST Otis Laboratory in Buzzards Bay, MA, will visit Frank Arthur and Guy Hallman of SPIRU on April 30, 2013 to plan cooperative research with the Khapra beetle, a voracious stored product pest not currently known to exist in the US but increasingly intercepted in imported articles. The objective of the research is to develop improved control techniques to prevent entry of the pest and aid in its control and eradication if it was found in any part of the US.



Drs. Guy Hallman (L) and Scott Myers (R)



# Center News

## Personnel News

**Marsha Grunewald**, Secretary to the Center Director retired on 2 Jan., after 32 years of distinguished Federal Service. Three photos at right are from her retirement party.

**Dennis Tilley**, EWERU technician and PhD student in Grain Science and Industry, defended his dissertation defense on 30 Jan. The title of his dissertation was, "Incidence and spread of insects from bucket elevator leg boots." (Photo #1)

### Arrivals:

**Dr. Hongli Li**, Forestry College, Shandon Agricultural University, Shandong Province, China, joined EWERU in January. She will study particulate matter 2.5 (PM2.5) emissions that affect air quality. (Photo #2)

**Dr. Jonathon Breitenbach**, Cat. 3 Scientist in ABADRU (Photo #3)

**Dr. Lindsey Fallis**, Post-doctoral Research Associate in SPIRU (Photo #4)

**Kevin Garmin**, Bio Science Aide in EWERU

**Katie Talley**, Engineering Tech in EWERU

### Departures:

**Dr. Jim Throne**, Research Leader, SPIRU (see front page)

**Drs. Karrie Buckman and Kris Silver**, Post-doctoral Research Associates in SPIRU

**Jerry Hunter**, HVAC Mechanic, Location Support Staff

**Marsha Grunewald**, Secretary, Center Director's Office (see above)

**Deb Beasterfield**, Property Technician, Location Support Staff

**Bethany Loomis**, Bio Science Tech, GQSRU

**A.C. Maurin**, Bio Science Tech, EWERU

**Randi Clark**, Bio Science Tech, HWWGRU



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