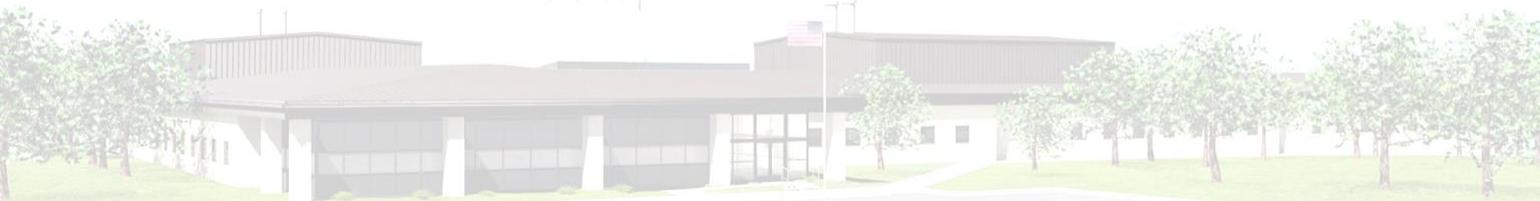


CGAHR Update

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Spring 2014

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Dr. Edward Skidmore Receives ISAR Distinguished Career Award



Dr. Ed Skidmore (left), Research Soil Scientist/Engineer (retired) was the recipient of the 2014 Distinguished Career Award by the International Society for Aeolian Research. Ed is the second recipient for this award since the Society was formed in 2008. Ed is the former Research Leader of the Wind Erosion Research Unit and retired in 2008 after more than 44 years of service.

Congratulations Ed!

Dr. Jim Campbell Receives ESA NCB Recognition Award in Entomology

Dr. Jim Campbell (right), Research Entomologist in the Stored Product Insect Research Unit (SPIRU), was selected to receive the 2013 'Recognition Award in Entomology' by the North Central Branch of the Entomological Society of America. This award recognizes entomologists who are making significant contributions to agriculture.

Congratulations, Jim!



Wind Erosion Research Wins FLC Award



Fred Fox (3rd from L) and Larry Wagner (4th from L) accept the FLC Award for Excellence in Technology Transfer on behalf of the team. Photo credit: Pavlos Karalis Photography.

Drs. Fred Fox, Lawrence Hagen, Edward Skidmore, John Tatarko, Larry Wagner and Simon van Donk, current and former scientists in the Engineering and Wind Erosion Research Unit (EWERU), were selected for the 2014 Federal Laboratory Consortium's Award for Excellence in Technology Transfer. The award is for the development and transfer of the Wind Erosion Prediction System.

Congratulations!



Research Highlight

Predictive Biology of Emerging Vector-borne Viral Diseases

The Arthropod-Borne Animal Diseases Research Unit is initiating a new research project to develop methods and tools to predict or define risks associated with potential future outbreaks of vector-borne viral diseases. The goals of this research program will be two-fold: 1) understand how viruses differentially adapt to insect and animal hosts, and how this knowledge can be used to break the transmission cycle and 2) develop better countermeasures (detection and preventative tools) to protect livestock production, and in the case of zoonotic diseases, prevent the transmission to human hosts.

The new funding will be used to study emerging families of viruses that include important emerging vector-borne viruses of animals. The research will develop and transfer tools to the agricultural community, commercial partners, and government agencies to control or eradicate domestic and exotic diseases and pests that affect animal and human health.

One of the new viruses to be studied is Japanese encephalitis, a disease of humans that is limited to Asia and the Western Pacific region. It is caused by the Japanese encephalitis virus (JEV). JEV is a member of the genus *Flavivirus*. Viruses of this genus also cause West Nile fever, yellow fever and dengue fever. Illness associated with JEV has spread rapidly throughout Southeast Asia, western Asia, Australia, and New Guinea. Japanese encephalitis cases are estimated to be 67,900 yearly, with 20-30% mortality rate, and 30-50% of survivors are left with neurological problems. Young children are particularly susceptible, and are more likely to die or suffer permanent neurological damage. The natural reservoir of JEV is swine and the virus spreads via disease vector mosquitoes. Several mosquito species are implicated in Asia, Australia, India, and even in the United States as potential vectors. Swine have high viral titers for several days but usually do not exhibit clinical disease or side effects.



Fig. 1. Mosquito vector *Aedes polynesiensis* feeding.

Swine are the main amplifying hosts for JEV. As such, this virus represents a threat to domestic pork production in the United States. The large feral pig populations, especially in the southern United States, are a potential reservoir of virus infection. Infection of either domestic or feral swine would establish a direct zoonotic threat to people. The introduction and rapid spread of West Nile virus has demonstrated the potential of establishment of an exotic arbovirus if susceptible mosquito vector and mammalian hosts are present.

The goals of this new project is to build predictive models to estimate relative risk to swine populations in the United States and to enhance the effectiveness of existing diagnostic and preventive countermeasures.

For more information contact: Dr. Scott McVey (785) 776-5561, Scott.McVey@ars.usda.gov



Meetings/Conferences

William Wilson traveled to Vienna, Austria, to participate in the Food and Agriculture Organization of the United Nations (FAO)/International Atomic Energy Agency (IAEA) Joint Division for Animal Production and Health Consultants Meeting entitled "Advances in development of early warning tools for detection of vector borne diseases of animals, including zoonoses - focus on vectors" 4-6 December 2013.

Lee Cohnstaedt traveled to Seattle, WA, 3-6 February 2014 as a symposium moderator and to present research at the 80th Annual Meeting of the American Mosquito Control Association.

William Wilson traveled to Nairobi, Kenya 2-9 February 2014 for a site visit and project development for a proposed U. S. Department of Defense – Defense Threat Reduction Agency (DTRA) funded project for the field validation for Rift Valley fever (RVF) diagnostic tools.

William Wilson traveled to Rome, Italy, 3-8 March 2014 to participate in the Food and Agriculture Organization of the United Nations (FAO) *ad hoc* workshop of scientists involved in the development of Rift Valley fever (RVF) animal vaccines and companion diagnostics. The principal goals of this meeting were to advance the discussion on RVF vaccine and diagnostics development to include vaccine trial and regulatory issues with RVF-endemic countries and potential manufacturers, to move from the experimental stage to pilot lot production and trials, and vaccine manufacture and use.

Lee Cohnstaedt traveled to Birmingham, AL 19-23 March 2014 to attend the North American Deer Farmer's Association (NADeFA) Annual Meeting. He was invited to present a talk on integrated pest management techniques for *Culicoides* disease vectors and met with board members to present on NADeFA funded research conducted by the USDA in Manhattan, Kansas. **Darren Snyder**, Kansas State University PhD student in Entomology co-advised by Dr. Cohnstaedt, presented research results on *Culicoides* control which he has conducted at CGAHR.

William Wilson, traveled to Seoul, Republic of Korea to participate in the spring meeting of the Korean Society of Veterinary Sciences 14-17 April 2014 as an invited plenary speaker and made a separate presentation to the Foreign Animal Disease Division (FADD) of the Korean Animal, Plant and Fisheries Quarantine and Inspection Agency.

Visitors

Dr. Phelix Majiwa, Program Manager, Senior Specialist Scientist, Biotechnology Division, Agricultural Research Council, Onderstepoort Veterinary Institute, Pretoria, South Africa visited ABADRU on 21 January 2014. Dr. Majiwa is an expert on Rift Valley fever and trypanosomes. Dr. McVey was his host and discussed ongoing and future collaborations. Dr. Majiwa toured the CGAHR facility and discussed current research with ABADRU staff. He also visited the Biosecurity Research Institute and faculty of the Kansas State University College of Veterinary Medicine.

Dr. Kariuki Njenga, Virologist and Director, One Health Program for the U.S. Centers for Disease Control and Prevention-Kenya, visited with ARS and Kansas State University 10-11 March 2014 and presented a seminar entitled "Rift Valley Fever: Risk Mapping and Vaccine Trial". Dr. Njenga is resigning from CDC-Kenya but will remain a collaborator with ABADRU as a Kenya Medical Research Institute faculty member.

Grants

ABADRU will receive \$183,032 from the Department of Defense Threat Reductions Agency to support surveillance for African swine fever in ticks in the Ukraine.



Research Highlight

Research Highlight: Seasonal Variation of Vegetative Wind Barriers

Farmers and other land owners have adopted vegetative wind barriers, also called shelterbelts, as economic and long-term solutions to minimize the effects of wind erosion. The aesthetic benefits of these structures have been well documented but the detailed airflow characteristics across the barriers that make them useful for preventing damage caused by wind erosion are still under study. This is due to the complexity of the structure of trees, which makes it difficult to establish all the parameters that are required to define a specific tree species.



Fig. 1. Tower with cup anemometers to measure wind speed.

In this work, optical porosities of a single row of deciduous Osage orange trees were obtained from photographs using digital image analysis. The resulting values were evaluated and compared with wind speed measurements (Fig. 1) and wind speed reductions computed downwind of the barrier.

Wind speed was compared for two leaf conditions (leaf-on and leaf-off) of the Osage orange trees (Fig. 2). The greatest wind speed reductions were seen at the anemometers located near the middle of the tree crown, with less reduction below the crown (6th anemometer) and near the top of the trees (2nd anemometer). The second anemometer (at 8.2 m) was located just below the average barrier height. The first anemometer (at 16 m) was well above the barrier height and there was no reduction in wind speed at that height (data not shown). The effect of the barrier was still evident at ten barrier heights downwind, especially during leaf-on conditions. Future studies will evaluate the wind speed reduction at greater distances downwind.

Current computer technology makes it possible to combine structural modeling of the trees with computational fluid dynamics (CFD) modeling to define the complex flow phenomenon within the barrier. This involves airflow modeling coupled with particulate movement (eroding soil particles) through the barrier. Preliminary tests were conducted with a solid barrier to evaluate the performance of OpenFOAM, an open-source (freeware under GNU Public License) computational fluid dynamics software, for simulating airflow through wind barriers.

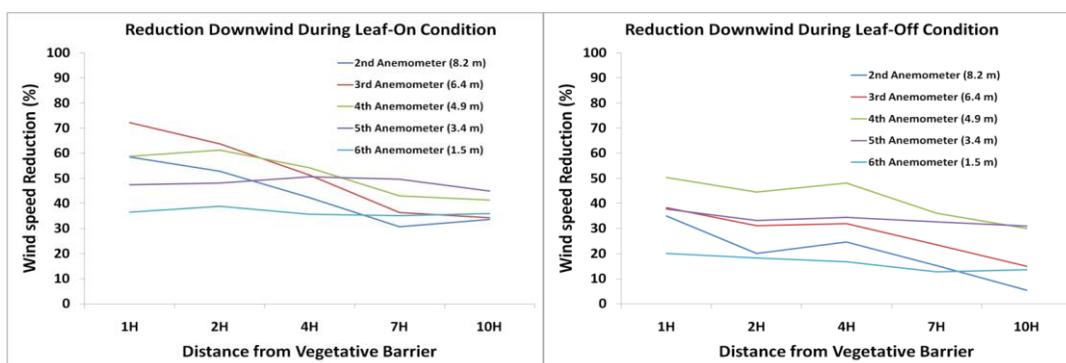


Fig. 2. Comparison of wind speed reduction (leaf-on vs. leaf-off conditions) downwind of the Osage orange barrier (H = average barrier height = 8.5 m).

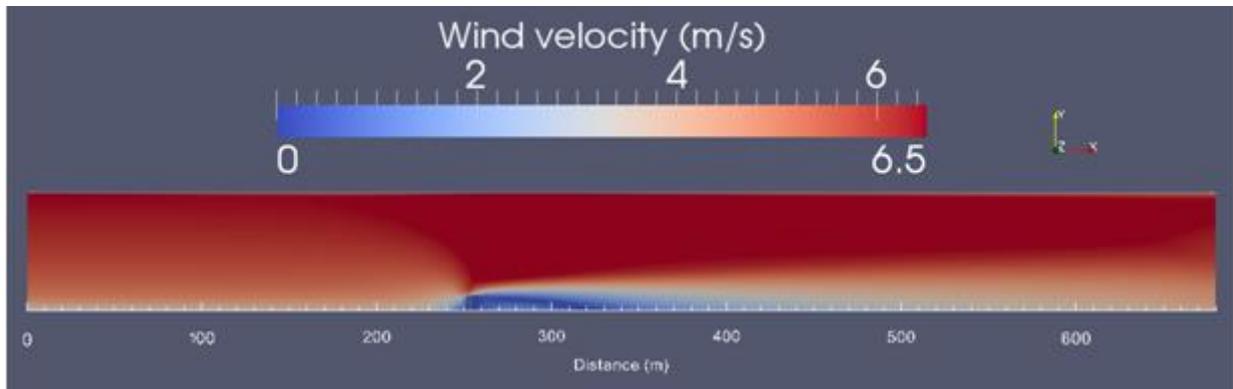


Fig. 3. Wind velocities predicted with OpenFOAM simulation of airflow with a solid barrier.

Wind speeds calculated in the preliminary simulation are shown in Fig. 3. These results showed good agreement with similar simulations for solid barriers calculated using commercially available software. The solid barrier in the preliminary simulation resulted in lower speeds (near zero) in the immediate wake of the barrier than were measured with the porous barrier. Like the measured velocities with the porous barrier, this simulation showed the wind speed reduction extended beyond ten barrier heights downwind. These results will improve our understanding of the seasonal variation in vegetative wind barriers on reducing wind erosion and provide data needed to include these effects in the WEPS wind erosion model.

For more information, contact: Howell Gonzales or Dr. Mark Casada (785) 776-2758, Mark.Casada@ars.usda.gov

Meetings/Conferences

Larry Wagner and **John Tatarko**, along with technicians and students, traveled to White Sands Missile Range, NM 1-10 January 2014 for field sampling related to dust emission on Department of Defense installations.

Larry Wagner traveled to Arlington, VA 28 April – 2 May 2014 to present an “in-house” progress report for his Strategic Environmental Research and Developmental Program (SERDP) grant related to the Dust Emissions on Dept. of Defense Facilities.

Mark Casada attended the Grain Elevator and Processing Society Exchange (GEAPS) annual meeting in Omaha, NE 22-27 February 2014.

Floyd Dowell travelled to Tanzania to train Ifakara Health Institute (IHI) personnel in the use of his near-infrared spectroscopy technique that has been adapted to determining mosquito age and species, 24 February – 8 March 2014.

Awards

Larry Wagner and **Fred Fox** accepted the 2014 FLC Award for Excellence in Technology Transfer for “Development and transfer of the Wind Erosion Prediction System in Rockville, MD, 23 April 2014 (see photo page 1).

Research Highlight

High-throughput Micro-Plate HCl-vanillin Assay for Screening Tannin Content in Sorghum Grain

Sorghum (Fig. 1) is one of the top five cereal grains produced worldwide. Sorghum offers many agronomic advantages over other grains including drought and heat tolerant traits. In the United States, sorghum is mainly used as a feed but has seen application in the food and biofuel industries. More recently, sorghum is recognized as a rich source of phytonutrients that possess anti-inflammatory and anti-carcinogenic properties.



Fig. 1. Heads from several sorghum varieties show some of the crop's diversity

The conflicting story in all of this is that the sorghum accessions used in the feed and food industries are not necessarily the same sorghum accessions that possess the phytonutrients associated with human health benefits. More specifically, the feed, food and biofuel industries require sorghum that does not contain tannin a compound found in the bran. Tannin has been reported to bind protein, reduce digestibility and potentially mitigate weight gain which is not desirable in the animal feed industry. Thus, sorghum breeders have worked diligently and have successfully ensured that the majority of sorghum lines grown in the United States do not contain tannin. Conversely the sorghum accessions that contain the highest level of phytonutrients are found in sorghum that contains tannin. Thus tests are needed to discriminate sorghum based on the presence or absence of tannin.

Historically the bleach and scratch tests have been used to rapidly determine the presence or absence of tannin in sorghum. These tests are simple and rapid (30 min) but the results are not reliable or quantitative. Thus, a chemical test (hydrochloric acid-vanillin method) was developed; while being more accurate, the test was time consuming and had low throughput. This left sorghum breeders in a quandary; they could either use the unreliable bleach test to rapidly determine if a specific sorghum accession possessed tannin or select a slower but more reproducible and quantitative method.

Researchers at ARS-Manhattan modified the existing quantitative chemical method and validated the test on a range of known tannin and non-tannin sorghum accessions. ARS researchers' employed a 96-well platform (Fig. 2) approach to improve efficiency and maintain accuracy of the conventional chemical test. The results showed that the modified test was as accurate as the existing chemical test, while significantly reducing the time required to conduct the test and increasing sample throughput. The 96-well platform approach resulted in an 8 fold increase in the number of measurements taken per day from 30 to 224. Sorghum breeders now have a validated high throughput test that will assist in accurately differentiating and quantifying tannin from non-tannin sorghum accessions in large sample sets such as seen in regional performance nursery trials.

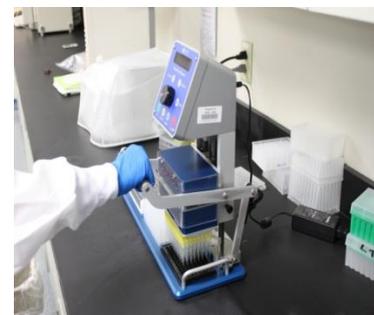


Fig. 2. Image of a 96-well pipettor used in the high throughput tannin assay

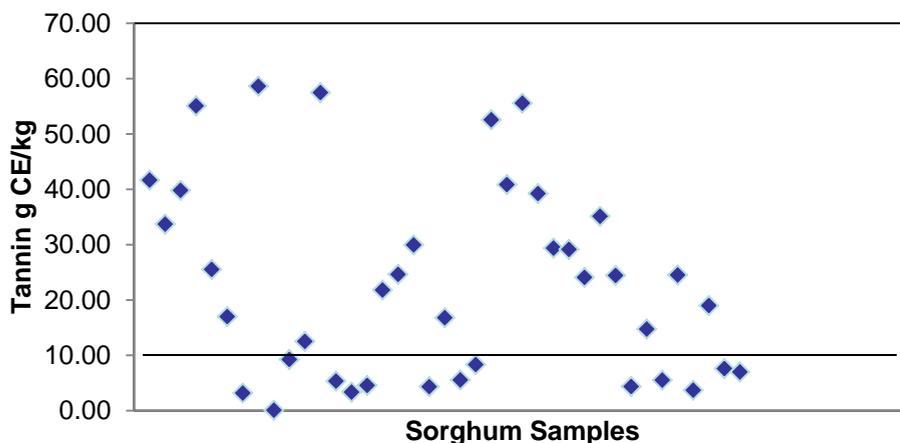


Fig. 3. A representative scatter plot showing the range of tannin content in a select sorghum population. Sorghum accessions with values below 10 g CE/kg are non-tannin sorghum

For more information, contact: Dr. Tom Herald (785) 776-2703, Thomas.Herald@ars.usda.gov

Meeting/Conferences

Prini Gadgil, Scott Bean, Jeff Wilson and **Tom Herald** attended a Sorghum Nested Association Mapping workshop at Kansas State University, Manhattan, KS on 21 January 2014.

Tom Herald visited USDA-ARS National Program Leaders Gene Lester and Jose Costa in Washington, D.C. to discuss new project plans 27-29 January 2014.

Margo Caley, Theresa Sutton, Richard Chen, Tom Herald, Laura Knapp and **Brad Seabourn**, members of the Hard Winter Wheat Quality Lab, attended the Wheat Quality Council meeting in Kansas City, MO 18-20 February 2014.

Tom Herald attended Plains Grains Incorporated's Spring meeting in Manhattan, KS on 28 April 2014 and provided the group with updates on the Hard Winter Wheat Quality Lab updates in preparation for the 2014 Crop Quality Survey.

Grants

Sorghum and Millet Innovation Lab (SMIL, formerly INTSORMIL) awarded **Dr. Scott Bean** and collaborators \$870,000 to conduct sorghum research. Dr. Bean's portion of the grant is \$192,533.

Visitors

Humberto R. Laxo, Addvalora Global Adjusters Latin American LLC visited on 20 December 2013 to discuss corn and wheat stover quality and usage.

Dr. Bill Rooney, Sorghum Breeder, Texas A&M University, visited on 22 December 2014 and discussed collaborative sorghum research.

Mark Hodges, CEO, Plains Grains Incorporated visited [WHEN?] to discuss the 2014 Crop Quality Survey.

Ram Persual, Kansas State University Sorghum Breeder met to discuss research on 3 February 2014.

Sarah Bowser, Regional Representative and Doug Bice High Value Director, for the United Sorghum Checkoff Program visited on 20 February 2014.

Drs. Geoff Morris and Sophia Bouchet, Kansas State University, visited 26 February 2014 to discuss sorghum research and grant proposals.

Dr. Ram Perumal, Kansas State University visited 10 March 2014 to discuss phenolic compound research on a set of black sorghum lines.

Dr. Vara Prasad visited 11 March 2014 and discussed nursery studies and grant proposals.

Drs. Josep Rizo, Department of Biophysics, Biochemistry and Pharmacology, University of Texas Southwestern Medical Center and Dr. Om Prakash, Department of Chemistry, Kansas State University met Unit researchers to discuss spectroscopic research on 31 March 2014.

Dr Tilman Schober, Cereal Scientist and Kyungsoo Woo, Senior Texture Specialist from Nestle R&D Center Inc., Solon, OH visited on 15 April 2014 and discussed potential CRADAs.

Dr. Sean Liu, Research Leader, USDA-ARS National Center for Agricultural Utilization Research in Peoria IL, visited and discussed potential collaborations for extramural funding on 17 April 2014.

Research Highlight

Development of Next Generation Markers for Wheat Breeding In the Great Plains

Wheat breeders are increasingly using DNA markers as a routine selection tool to speed up the breeding process and to improve selection efficiency. The USDA-ARS Small Grains Genotyping Lab in the Hard Winter Wheat Genetics Research Unit works closely with wheat breeders in the Great Plains to perform DNA marker analysis for their breeding lines. Every year, the lab analyzes more than 10,000 breeding samples and generates about 200,000 genotyping data points. In the past, the major marker technology used has been simple sequence repeats (SSRs). However, wheat only has about 2000 SSRs publicly available, which cover only a very small portion of the huge wheat genome and also only 10-20% are usable in any given mapping population. Recent development of next generation sequencing technology has opened the door to a new type of marker called single nucleotide polymorphisms (SNPs). Because SNPs are unlimited in number and distributed over the entire plant genome, they are ideal to serve as a marker for tagging genes of breeders' interest. SNPs are also suitable for high-throughput analysis, and thousands of SNPs can be assayed simultaneously, thus it can be used to select for multiple genes/traits in one plant.

Several SNP genotyping platforms are available for both SNP discovery and analysis in breeding populations. First, you can do genome-wide high density (and high cost) genotyping using the new iSelect 90,000 SNP wheat chips developed by the International Wheat SNP Consortium. The Manhattan genotyping lab can help with initial steps, but the chip assay is actually performed by the USDA-ARS genotyping lab in Fargo, ND. We have successfully used the 90K chip to map genes for resistance to soilborne wheat mosaic virus and leaf rust resistance, and closely linked SNPs were identified for routine selection of these genes in breeding programs. The second platform is the KASP assay. Many different traits can now be tested with the KASP platform. KASP assays are inexpensive and reliable, but are developed one at a time for individual alleles. For example, we recently cloned a gene for preharvest sprouting resistance and breeder-friendly SNP markers (KASP SNPs) were developed based on the causal SNP of the gene. Developing these markers needs previous knowledge of sequence information. A recently developed marker system called genotyping-by-sequencing (GBS) using next generation sequencing technology gives genome-wide coverage for a reasonable cost per data point. Currently, we can generate about 10,000 SNP data points per sample for 192 wheat samples daily at the cost of \$10 per sample. GBS markers can be used for gene mapping studies and for marker-assisted selection of breeding lines.

SNP Markers

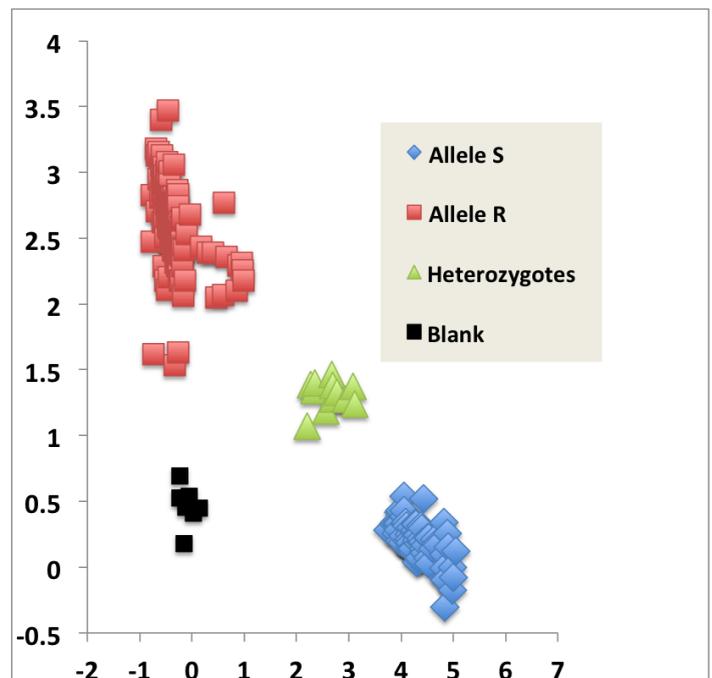


Fig. 1 A KASP assay of a SNP marker (KASPTaPHS1-646) was developed for a gene, *TaPHS1*, that regulates wheat resistance to preharvest sprouting on chromosome 3AS. The figure shows clear separation of two SNP alleles of *TaPHS1*, Allele R (red), Heterozygote (green) and Allele S (blue). Black spots are blank control.

For more information, contact Dr. Guihua Bai (785) 532-1124, Guihua.Bai@ars.usda.gov

Meeting/Conferences

Guihua Bai, Robert Bowden, and John Fellers attended the Plant and Animal Genome Conference in San Diego, CA on 10-15 January 2014.

Robert Bowden visited colleagues at Oklahoma State University in Stillwater, OK on 18-19 February 2014. He gave a seminar titled "Waste Not, Want Not: The importance of Being Earnest About Gene Stewardship."

Ming-Shun Chen attended the Annual Entomological Science of America Meeting in Austin, TX from 9-14 November 2013.

Ming-Shun Chen traveled to Marrakech and Rabat, Morocco, from 13-28 April 2014 to attend the 21st Biennial International Plant Resistance to Insect Workshop (IPRI), visit Dr. Mustapha El Bouhssini at the International Center for Agricultural Research in Dry Area (ICARDA) in Rabat, and collect tissue samples of wheat insect pests.

Visitors

Dr. Raju Datla, Plant Biotechnology Institute, National Research Council of Canada, Saskatoon, visited on 5-6 March 2014 and gave a seminar entitled "Genomics of seed development and metabolism: challenges and opportunities in crop plants."

Dr. Liuling Yan, Oklahoma State University, visited on 26-27 March 2014 and gave a seminar entitled, "Can *Lr34* resistance to leaf rust be upgraded in winter wheat?"

Dr. Bob Hunger, Oklahoma State University, visited on 2-3 April 2014 and gave a seminar entitled, "A pathologists reflections on interacting with plant breeders sprinkled with a glimpse of the future."

Dr. Nader Abdelsalam Mohamed, Assistant Professor, Department of Biology, Faculty of Agriculture Saba Pacha, Alexandria University, Egypt, successfully finished one-year sabbatical research in the USDA Genotyping Lab. His research project "mapping wheat resistance to Hessian Fly and curl mite using genotyping-by-sequencing" was supported by Islamic Development Bank, Jeddah-Saudi Arabia.

Dr. Shoucai Ma, Associate Professor from College of Agronomy, Northwest A&F University, Shannxi China finished one-year sabbatical research in the USDA Genotyping Lab. His research on "Association analysis of wheat yield traits using SNP markers" is sponsored by Chinese Scholarship Council.

Dr. Peigao Luo, Professor of wheat genetics and breeding, College of Agronomy, Sichuan Agricultural University, Sichuan, China started his one-year sabbatical research in the USDA Genotyping Lab.



Research Highlight

Spatial Pattern in Aerosol Insecticide Deposition Inside Food Facilities

An aerosol insecticide application, also called space, ultra-low volume (ULV), or fogging treatment, involves the release of insecticide into the air in the form of small droplets. Aerosol insecticides can be used as part of an integrated pest management program for food facilities such as mills, food-processing plants, warehouses and distribution centers. Aerosol applications can provide more complete coverage of surfaces within a structurally complex food facility than is feasible with conventional spray applications. This improved coverage increases the chance of a stored product insect encountering the insecticide either during application or afterwards through contact with a treated surface. However, the structural complexity of many food facility interiors may also influence the dispersal and deposition of aerosol droplets, creating spatial variation in insecticide dosage applied.

An experiment was conducted to evaluate spatial pattern in aerosol insecticide deposition within a food facility, in this case a research flour mill located at Kansas State University. This work was funded in part by a grant from USDA NIFA Methyl Bromide Transitions program and collaborators on this aspect of the project were Dr. Frank Arthur, USDA ARS CGAHR, and Dr. Kun Yan Zhu, Kansas State University. Three different aerosol insecticides were evaluated at two different temperatures (normal room temperature and high temperature). Bioassay dishes containing confused flour beetles were placed in a grid pattern throughout each floor of the mill and their response to the insecticide was quantified using a new efficacy index.

There was spatial pattern to aerosol deposition detected for the two pyrethrin insecticides evaluated, with zones having high and low efficacy that differed between aerosols and temperatures (see figure showing examples of the contour maps of insecticide efficacy that were generated). Walls and corners, especially behind the direction of application, were especially vulnerable to being zones of lower efficacy, and open areas in center of the room tended to have the highest efficacy. An organophosphate insecticide tested provided complete mortality at all bioassay dish locations, primarily due to its toxicity as a gas and probably not due to better coverage with droplets. These approach was useful in showing that spatial variation in aerosol efficacy can occur within a food facility and identifying locations with the potential to receive a lower insecticide dosage. Ultimately, this information can be used to predict zones within a facility that may not be obtaining adequate efficacy so that modifications to application methods or alternative supplemental treatments could be applied to generate a more uniform coverage.

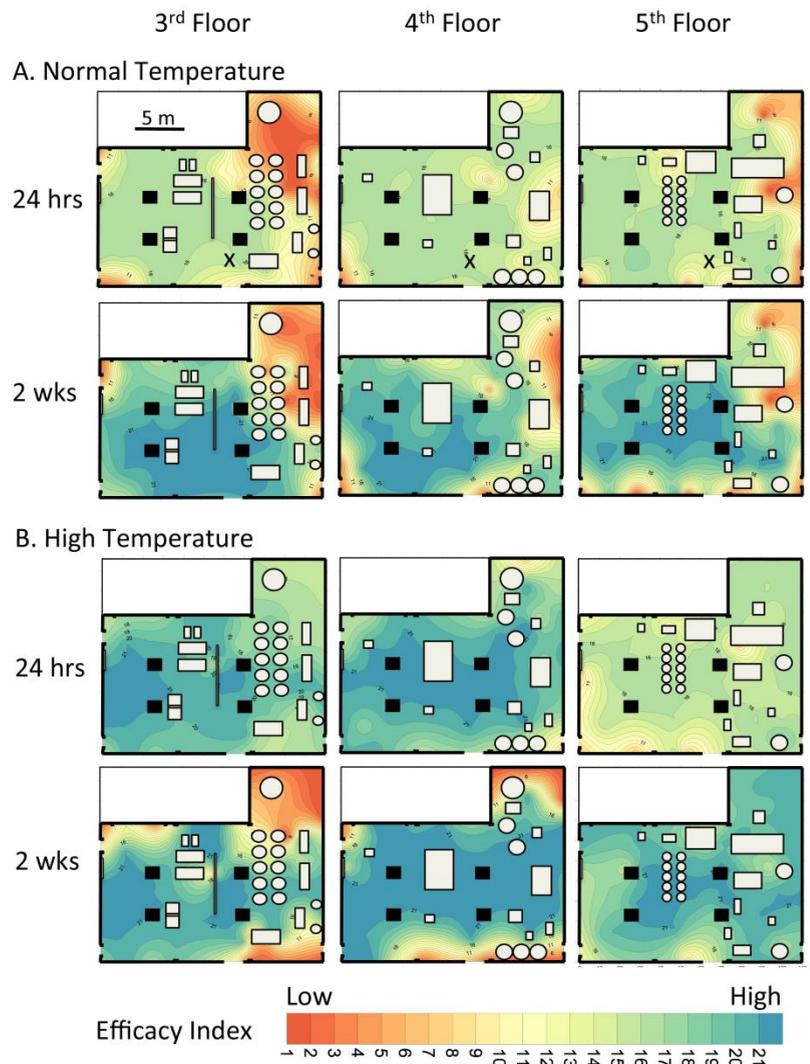


Fig. 1. Contour maps of the impact of the aerosol application on the grid of bioassay dishes containing confused flour beetle (Aerosol applied on different floors of the mill and at different temperatures). Areas that have low values (reddish color) had low mortality and areas with high values (greenish color) had high mortality.

For more information, contact: Dr. James Campbell (785) 776-2717, James.Campbell@ars.usda.gov

Meeting/Conferences

Jim Campbell attended the Food Safety Summit in Baltimore, MD, 7-9 April 2014, and presented a seminar on the use of pheromones for monitoring and mating disruption programs for the food industry.

Frank Arthur attended the Grain Elevator and Processing Society (GEAPS)/International Association of Operative Millers (IAOM) – Great Lakes Regional Conference in Angola, IN, 26-28 March 2014 and presented two talks: “Phosphine & Integrated Pest Management for Stored Grain,” and “Aerosols & Contact Insecticides for Controlling Stored Product Insects in Mills & Warehouses.”

Jim Campbell attended the North Central Branch of the Entomological Society of America (NCB/ESA) Annual meeting in Des Moines, IA, 9-12 March 2014.

Frank Arthur and **Jim Campbell** attended the Rice Technical Working Group Meeting at Louisiana State University, New Orleans, LA, 18-21 February 2014. Frank presented “Red Flour Beetle Development on Rice Fractions.” Jim presented “Stored-Product Insect Exploitation of Rice Spillage Accumulations.” They both also met with collaborators and participated in the Methyl Bromide Transitions Grant meeting – being held at the same location.

Frank Arthur met with collaborators at MRI Global, Kansas City, MO, on 12 February 2014, and met with collaborators at Industrial Fumigant Company, also in Kansas City on 13 February 2014, where he presented a talk, “Cold Temperatures and Control of Stored Product Insects,” at a management meeting of Industrial Fumigant Company.

Frank Arthur attended a quarterly meeting of the International Association of Operative Millers (IAOM) and Food Protection Committee, in Phoenix, AZ on 16 January 2013.

Brenda Oppert and **Lindsey Fallis** attended the Plant and Animal Genome Conference in San Diego, CA, 11-15 January 2014. As invited speakers, Brenda presented “Analysis of Gene Expression in *Tenebrio molitor* Larvae Intoxicated by *Bacillus thuringiensis* Cry3Aa Toxin,” and Lindsey presented, “Expression Patterns of Cysteine Peptidase Genes Throughout the *Tribolium castaneum* Life Cycle.”

Guy Hallman went to Buenos Aires, Argentina 30 November – 7 December 2013 to attend the Expert Consultation on Cold Treatments, at the request of APHIS. The ECCT is being hosted by the International Plant Protection Convention. This meeting was designed to identify, collect, and evaluate information on existing cold treatments that are needed for regulated pests and regulated articles and that may be implemented at a global level.

Frank Arthur, Jim Campbell, Guy Hallman, and John Diaz attended the 2013 ESA meeting in Austin, TX, 9-14 November 2013. All presented a talk or poster, and acted as a moderator or as a student presentation judge at this meeting.

Jim Campbell attended the Pennsylvania State Pest Management Conference, in Lancaster, PA, 3-6 November 2013, as an invited speaker presenting “Stored Product Pests and Pheromone Technology.”

Frank Arthur attended the International Conference on Methyl Bromide Alternatives and Emissions Reductions in San Diego, CA, 2-7 November 2013. He presented 3 talks while at this meeting; 1) Integrated Pest Management for Stored Grain; 2) Red Flour Beetle Management in Rice Mills; and 3) Susceptibility of Flour Beetle Life Stages to Pyrethrin Aerosol.

Awards

Jim Campbell received the Recognition Award in Entomology (see page 1).



The Red Flour Beetle (L) and the Confused Flour Beetle

Grants

Jim Campbell, Frank Arthur, and Paul Armstrong (Engineering and Wind Erosion Research Unit) are part of a multi-institutional team (including Kansas State University, Oklahoma State University, and Fort Valley State University) that successfully obtained a USAID Feed the Future grant. The 5-year, \$5 million grant, "Alliance for Food Security through Reduction of Postharvest Loss and Food Waste", will focus on improving stored-product pest management in grain storage warehouses in Ghana, Africa. ARS scientists will develop stored-product insect pest monitoring programs in warehouses, insecticide-treated packaging to reduce insect infestation, and a low cost moisture meter to better monitor grain conditions to reduce insect infestation and aflatoxin contamination.

Visitors

Dr. Raul Guedes, Federal University of Viçosa, Brazil, was the 2014 Kansas State University Entomology Department Distinguished Alumnus, and visited SPIRU on 6 November 2013.

Sam Reichert from Sensor Development Corporation visited SPIRU the week of 13 January 2014 to test a sensor that can detect lesser grain borer pheromone and other compounds in the headspace of grain bins.

Dr. George Opit from Oklahoma State University, his post-doctoral associate **Dr. Sandipa Gautam**, and his graduate student **Sulochana Paudyal** visited Dr. Frank Arthur from 5-7 February to receive training in techniques to evaluate residual efficacy of insecticide-impregnated packaging bags. This is part of a cooperative project with Dr. Opit and with Vestergaard-Frandsen Corporation, who is supplying the bags. The research will be part the graduate research being conducted by Ms. Paudya.

A group of about 23 pest management professionals from **Rentokil** visited with **Jim Campbell** and **Frank Arthur** on March 18, 2014 to learn about the Stored Product Insect Research Unit and the research being conducted here. The short tour of the facility was provided and then there was interaction in small groups to discuss research findings and their implications for pest management in commercial food facilities. This visited provided a great opportunity for technology transfer and to learn about industry needs.



Upper photo: Drs. Floyd Dowell and George Opit, with Sulochana Paudyal; lower photo Dr. Sandipa Gautam.



Dr. Frank Arthur (with glasses) discusses stored product research with Rentokil staff.



Dr. Jim Campbell (red sleeves) discusses stored product research with Rentokil staff.

Center News

Personnel News

Departures

Dr. Tom Pearson (#1, at right), Agricultural Engineer (EWERU), left CGAHR in May to take a job in private industry. We thank him for his dedicated service and wish him success in his new endeavors.

Dr. Paul Flinn (#2), Research Entomologist (SPIRU), retired after 25 years of federal service. We thank him for his dedicated service and wish him the best in retirement.

Dr. Jesse Poland (#3), Research Geneticist (HWWGRU), left to take a position at Kansas State University. We thank him for his dedicated service and wish him success in his new endeavors.

Arrivals

Leigh Terhardt (#4) joined CGAHR as an IT Specialist

Roy Wagner (#5) joined CGAHR as an HVAC Maintenance Mechanic

Doug Morrison (#6) joined CGAHR as a Maintenance Worker

Dr. Phillip Schumm (#7), Research Geneticist (post-doc), joined ABADRU

Dr. Ashley Galant (#8), Research Chemist (post-doc), joined GQSRU

1.



2.



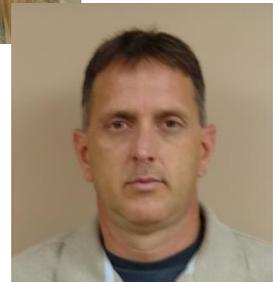
3.



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