

# GMPRC Update

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## Spring 2008

This new quarterly newsletter will focus on the people, research activities and impact of GMPRC. Research Kernels, a different newsletter, is distributed monthly and reports the latest research findings from GMPRC scientists. Please feel free to contact me with comments or suggestions. Tom Shanower, Director; [tom.shanower@ars.usda.gov](mailto:tom.shanower@ars.usda.gov)

## Welcomes and Farewells...

New federal employees who have recently joined GMPRC include Sarah Harmer, Alicia Mayer, Rachel Schultz, Jeremy Walker, Trevor Wilkey and Renee Wullschleger. Welcome! Pat Milham, who worked here for five years, and Joe Smith, who worked at GMPRC for approximately 20 years, have both retired recently. Also leaving GMPRC, Jamie Schwartz; Jean Wrosch, now with USDA-FSA; and George Opit, now at the Dept. of Entomology and Plant Pathology at Oklahoma State University.

GMPRC's Biological Research Unit also hosted a visiting entomologist: Christos Athanassiou. Athanassiou is from Athens, Greece, and conducted research on stored-product insects and diatomaceous earth.

Athanassiou said he thought he accomplished more than they had initially planned. Besides working with just stored-product insects and diatomaceous earth, he was able to do additional research with beetles and extreme temperatures.

He also said that GMPRC employees work well together, as well as working well with Kansas State University and their employees. "I think Manhattan is the No. 1 lab in stored-product grain and everyone wants to come here to work," Athanassiou said.

Athanassiou will be returning to GMPRC's BRU this summer to continue working with Jim Throne, Research Leader, and Frank Arthur, Research Entomologist, on stored-product insects and diatomaceous earth.



## On the research side...



Jeff Wilson, from the Grain Quality and Structure Research Unit, is studying starch chemistry and its size distribution to elucidate the role and interactions starch has in bread and food systems. Wilson said their research is helping the baking industry. "We're looking at the biochemical aspect of cereal grains -- specifically wheat and trying to come up with better links to quality."

Wilson recently completed a seven-year study concerning starch from Hard Red Winter wheat grown near Manhattan, Kansas. Wheat was harvested periodically during the growing seasons, and starch was isolated and weather data collected. This information was compared and contrasted to gain a better understanding as to how the environment can impact starch development. In most varieties studied, their findings indicate precipitation and temperature caused shifts in starch size distributions. He is also working with the University of Manitoba on a similar study evaluating starch size distribution in Canadian wheat varieties grown in different environmental conditions.

## Community Interest...

GMPRC has made a serious commitment to recycling. Each month we recycle cardboard boxes, slick paper (magazines, etc.) newspaper, cardboard, shredded paper, peanuts, batteries, and pop cans. In 2008, GMPRC has already recycled approximately 700 pounds of cardboard.

Volunteers include Ann Redmon, Michelle Hartzler, Chet Smith, Hubert Lagae, Tilman Schober, SeokHo Park, Brian Barnett, Elaine Liddell, Rich Hammel, Jim Campbell, Brad Seabourn, Barb Marn, Kimberly Plummer, Terri O'Leary, Margo Caley, Zina Haden, Laura McLaughlin, Marsha Grunewald, Richard Chen, Jeff Lord, Lei Gong, Jonathan Staats and Tom Shanower.



## Spotlight on Excellence...

*Richard Beeman sequenced the genome of the red flour beetle- the first agricultural pest to have its genome sequenced. His research has won numerous awards and he was recently recognized as **USDA-ARS Senior Scientist of the Year in the Northern Plains.***

*GMPRC: What attracted you to sequencing the red flour beetle?*

*Richard Beeman: The National Human Genome Research Institute became interested in organisms that could shed light on human genomes, which led us to the red flour beetle. We thought they might be interested in agricultural pests that could shed light on human biology.*

*GMPRC: How long have you been conducting research on the red flour beetle's genome sequence?*

*Richard Beeman: We wrote the proposal in 2003 and the sequence was roughly finished in 2005. For about two years it's been available. Since then it's been refined and annotated.*

Results of this research were published in **Nature Online 23 March 2008. "The genome of the model beetle and pest *Tribolium castaneum*"** available at: [www.nature.com/nature/journal/vaop/ncurrent/full/nature06784.html](http://www.nature.com/nature/journal/vaop/ncurrent/full/nature06784.html)

*GMPRC: What have you discovered about the red flour beetle now that your research is complete?*

*Richard Beeman: There are about 16,000 genes. Many of them have important functions without which the insect can't live. Many of those genes are targets for insecticides. The genome sequence is a gold mine for looking at new ways to control insects. You are wandering around in the wilderness picking at genes. Now it's an ocean of genes. It's incredibly unique.*

*GMPRC: How can this help the industry?*

*Richard Beeman: We are learning how insects overcome plant defenses. This research is going to give us new genes targets for inhibitors that we can put in transgenic plants. That area has a lot of potential. There are going to be new ways to control pests that we can't even imagine.*

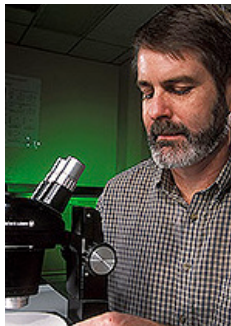


## Grants & Award Winners...

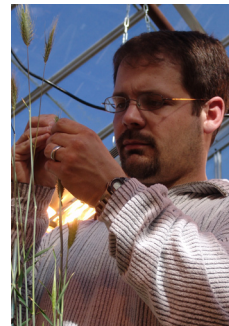
Recent grants received by GMPRC researchers....



**Paul Armstrong**  
"Development of near infrared measurement methods for single soybean seed composition" awarded by the University of Kentucky



**Floyd Dowell**  
"Single Kernel Sorting Technology for Enhancing Scab Resistance" awarded by the U.S. Wheat and Barley Scab Initiative and "Evaluate the use of NIRS for identifying the sibling species of *Anopheles gambiae* complex" awarded by the International Atomic Energy Agency



**Mike Pumphrey**  
"The Durable Rust Resistance in Wheat Project" awarded by the Bill & Melinda Gates Foundation