Herman Receives Andersons Award of Excellence

At this year’s NC-213 Annual Meeting/Winter Technical Session, NC-213 members enjoyed sharing research that was presented during the technical sessions held on Tuesday, February 26, and Wednesday, February 27. Twelve presentations, showcasing research from NC-213’s three objectives, were presented.

In addition, the industry panel discussion members facilitated informative conversation on the morning of February 27. Besides attending NC-213 events, participants had the opportunity to attend all or part of GEAPS Exchange 2008. All events were held at the Omaha Hilton and Qwest Center Omaha.

Andersons Award of Excellence

A highlight of the meeting was the presentation of The Andersons Award of Excellence. This year’s recipient was Dr. Tim Herrman, Office of the State Chemist, Texas A&M University.

Dr. Herrman has spent his entire career working with the grain and feed industries to improve grain and feed quality. His work has focused on operational efficiency in the grain industry and has employed an interdisciplinary approach that has combined engineering, economic, and biological disciplines. A major thrust of his work has involved investigating the feasibility of segregating wheat at commercial grain elevators based on protein content and configuring sampling and traffic flow designs to reduce grain delivery times for farmers.

He has organized and conducted numerous short courses that have drawn participants from the United States and the world. These short courses have greatly contributed to improving profitability and management tools for the grain industry.

During the course of his career, this year’s winner has written and co-written more than 60 research and extension publications and produced a Feed Quality Assurance Handbook as an interactive CD. These efforts have resulted in recognition and awards from the grain industry that have acknowledged and celebrated his achievements.

Dr. Herrman’s research and extension efforts have made superior contributions to science and outreach education related to cereal grains and the cereal industry. Further, he has been a very active participant in the NC-213 multistate project that deals with grain quality and marketing and has contributed greatly to the operation, activities, and successes of NC-213, having served in all of the major offices of the Executive Committee.

Dirk Maier Named Head of K-State’s Department of Grain Science and Industry

MANHATTAN, Kan. – Dirk Maier, professor and associate head of Purdue University’s Department of Agricultural and Biological Engineering, has been tapped to lead Kansas State University’s Department of Grain Science and Industry. He will begin his duties at K-State on April 1.

Maier, who earned bachelor’s, master’s, and Ph.D. degrees in agricultural engineering from Michigan State University, has been a professor and extension agricultural engineer at Purdue since 1984. He was also a guest professor and extension agricultural engineer at Purdue since 1991, and associate head since 2005.

He is a Purdue University Faculty Scholar for 2005–2010 and was a DAAD Guest Professor at the University of Hohenheim in Stuttgart-Hohenheim, Germany, in June 2004. He was also a guest professor at the University of Torino, Italy, in 2003 and a Fulbright Scholar at the Universidad Nacional de Mar del Plata in Balcarce, Argentina, in 2000.

Maier’s research has focused on engineered technologies for the protection of stored products and the delivery of identity-preserved, traceable, and biosecure quality grains to the food, industrial, biofuels, and feed-processing industries.

He has secured more than $9 million in research, technology transfer, and extension education grants. He has received numerous awards including the 2007 The Andersons/NC-213 Cereals and Oilseeds Award of Excellence in Research.

At K-State, Maier will lead a department that is known worldwide in the baking, milling, feed-production, and grain-handling industries. K-State is the only place in the United States that offers college degrees in baking, feed and milling science and management. The university also is expanding its reach into biorefinery/biofuels operations management. The program grants bachelor’s, master’s, and Ph.D. degrees in those areas.

Maier will succeed former grain science department head Richard “Dick” Hahn, who came out of retirement last year to serve as interim grain science department head while the university conducted the national search that led to Maier’s hiring.
Floyd Dowell: 785-776-2753; e-mail: floyd.dowell@ars.usda.gov

**Discrimination of Soft and Hard White Wheat Kernels Using the Single Kernel Characterization System Parameters and Kernel Imaging**

Wheat kernel hardness is a measure of the kernel texture and an important indication of baking qualities of flour produced from the wheat. While wheat can have a broad range of hardness values, there are two main categories, or classes, of wheat based on hardness — soft and hard. It is desirable to market and trade wheat of a pure hardness class as it will have more predictable end use qualities.

One of the most commonly used methods for measuring wheat hardness and determining purity of hardness classes in loads of wheat is the Single Kernel Characterization System (SKCS). However, for some varieties of wheat, particularly those grown in the Pacific Northwest, the SKCS has trouble distinguishing kernels from hard and soft classes. This leads to errors in determining if a sample is pure hard wheat, pure soft wheat, or a mixture.

This research focused on improving the accuracy of the SKCS for wheat grown in the Pacific Northwest by use of more modern digital signal processing of the data that the SKCS already produces and by combining images with the SKCS. It was found that integrating new signal processing techniques into the SKCS software can reduce in half the errors made by the SKCS. By adding data extracted from images of kernels, the errors can be reduced by more than 70 percent.

This technology should help wheat inspectors to determine the proper quality of a load of wheat, especially at export terminals. This will help improve the quality and international competitiveness of wheat produced in the United States.

Thomas Pearson; 785-776-2729, e-mail: thomas.pearson@ars.usda.gov

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Mark Casada: 785-776-2758; e-mail: mark.casada@ars.usda.gov

**Near-Infrared Spectroscopy Detects Honey Bee Queen Insemination**

The widespread honey bee colony mortality known as Colony Collapse Disorder may be related to queen fertility and pathogens. A rapid, non-invasive method for assessing bee fertility and health would be useful in studies of affected bee colonies. Investigators examined the application of near-infrared spectroscopy to determine queen fertility and the presence of pathogens. The abdomens of honey bee queens, the heads of worker bees, and the ventricles of worker bees were analyzed by visible and near-infrared spectroscopy.

Mated honey bee queens could be distinguished from virgin queens by their spectra with 100 percent accuracy. Also, the heads of worker bees taken from the brood nest of a hive had reflectance spectra that differed from those of flying workers taken from the hive entrance. These spectra could be used with about 85 percent accuracy to predict whether bees were from the brood nest or were flying bees. However, researchers were not able to determine the severity of Nosema apis infection in worker ventriculi. This technology can be useful to rapidly and non-destructively determine the honey bee characteristics as scientists attempt to understand the Colony Collapse Disorder phenomenon.

Floyd Dowell; 785-776-2753, e-mail: floyd.dowell@ars.usda.gov

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The winning proposals are:

**Multiplex, Quantitative, Real-Time PCR for Rapid Detection, Identification, and Quantification of Fusarium spp. in Durum Wheat**, submitted by Dr. Charlene Wolf-Hall, Department of Veterinary and Microbiological Sciences, North Dakota State University. Dr. Dennis Tobias, Dr. Wolf-Hall’s Post-Doc, will be working on this research, as well.

**Evaluating Energy Efficient Strategies and Product Quality for Distillers’ Dried Grains with Solubles (DDGS) in Dry Grind Ethanol Plants**, submitted by Dr. Klein Ileleji, Department of Agricultural and Biological Engineering, Purdue University. Assisting Dr. Maier in the research are Dr. Dirk Maier and Dr. Teshome Jiru, both of the same department, and Mike Myrick, The Andersons Clymers Ethanol plant.

**Scale Up of a Nitrogen-Based Stored Product Pest Treatment System for Container Shipment of Specialty Grains and Their Products**, submitted by Dr. Dirk Maier, Department of Grain Science and Industry, Kansas State University. Assisting Dr. Maier in the research are Dr. Dale Jude Moog, Dr. Jiqin Ni, Department of Agricultural and Biological Engineering, Purdue University; and Dr. Linda Mason, Department of Entomology, Purdue University; and Dr. Charles Woloshuk, Department of Botany and Plant Pathology, Purdue University.

Congratulations to the winners!