

Penn State Professors Honored For Produce-Checking Research

UNIVERSITY PARK (Centre Co.) — Two professors in Penn State's College of Agricultural Sciences were part of a team that won a prestigious Secretary's Award from the USDA for research work to increase the efficiency, security, sustainability, and profitability of the fruit and vegetable industry through application of new technology.

Paul Heinemann and Joseph Irudayaraj, professor and associate professor, respectively, of agricultural engineering, are part of the Northeast Multi-State Research Group nominated for the honor from the USDA's Cooperative State Research, Education and Extension Service. Researchers at 12 other universities and Penn State, as well as at several USDA laboratories, have been investigating how nondestructive, noninvasive technologies can be used to reveal the condition of fruits and vegetables.

"As a group, we have looked at what advanced sensor technologies — such as X-rays, nuclear magnetic resonance imaging, infrared spectroscopy, and machine vision — can quickly and efficiently reveal about produce," said Heinemann. "Most of these technologies have come from medical disciplines, and the major advantage is that they don't damage the fruit or vegetables, unlike other laboratory tests that are much slower and result in a waste of produce."

Using advanced technologies allows processors to check for such things as pathogens, bruises, spoilage, surface blemishes, and size along the production line at a packing plant, where it would be impractical to do laboratory tests. Some of these technologies are already in commercial use to protect food safety.

"It's very important to the public directly," said Heinemann. "This technology affects the quality of what folks see and buy in the grocery stores. We tried to apply existing technologies to detect the presence of pathogens and other defects before the produce gets to market."

In recent years, Heinemann, who earned his master's degree in agricultural engineering from Penn State and his doctoral degree in agricultural meteorology at the University of Florida, has concentrated on applying "electronic nose" technology.

"The electronic nose is a device that attempts to mimic the human sense of smell," he said. "The one I have been working with has 32 sensors, and each one is sensitive to a different compound. For example, we have used it to detect e. coli on apples. This technology shows promise in detecting the presence of bacteria before fruit or vegetables even go into a processing plant. It will be a first-step filter."

Irudayaraj, who received two master's degrees from University of Hawaii — one in agricultural engineering and the other in computer science and a doctoral degree from Purdue in food process engineering, has focused his research on optical sensors for food quality and safety assessment. This technology can reveal the presence of certain defects or surface characteristics on produce by detecting differences in the way light is reflected.

For instance, a chemical incident on an apple may not be easily visible to a human eye, but may be readily apparent in the infrared fingerprint. Spectroscopic fingerprints of foods with different levels of contaminants, as well as with different microorganisms, indicate that differentiation and classification is possible. In more complex situations, "markers" need to be identified for classification.

"We are using visible, near-infrared, and mid-infrared light wavelengths to evaluate the quality of produce and to look for contaminants and undesirable chemical components," Irudayaraj said. "Rapid detection and evaluation will allow the discovery of pathogens without laboratory analysis, yielding immediate results."



Museum Celebrate's 25th Anniversary At Ag Progress Days

ROCKSPRING (Centre Co.) — Penn State's Pasto Agricultural Museum will celebrate 25 years of preserving the history of agriculture and rural living here during Ag Progress Days, Aug. 19-21.

The museum will feature a special exhibit titled "Twenty-Five Years and Growing." Twenty-nine photographs and accompanying text will illustrate the growth of the museum's collection to more than 900 items since 1978.

The idea to gather and preserve pieces of agricultural history began in 1974 with the College of Agricultural Sciences Alumni Society, according to the museum's volunteer curator, Darwin Braund. With \$1,500 and a few display cases in the Agricultural Administration Building, the Pasto Agricultural Museum was born.

In May 1978, the Ag Alumni Society decided to move forward with a building project, and a year later the building at Rockspring was dedicated. It was officially opened to the public on Aug. 22, 1979 during Ag Progress Days.

Starting with an initial collection of about 150 items, the total collection of more than 900 items far exceeds available exhibit space in the museum. "In honor of our 25th anniversary, many larger items, including several horse-drawn vehi-

cles, will be moved from storage and displayed in an adjacent tent," said Braund. "Less than two-thirds of the collection can be exhibited in the museum at any given time."

In 1980, the museum was named for its first curator, Jerome K. Pasto, associate dean emeritus of the college and professor emeritus of agricultural economics. In 1998, Darwin Braund, professor emeritus of animal science at North Carolina State University and 1956 Penn State alumnus, took over as curator.

The Pasto Agricultural Museum serves between 8,000 and 10,000 visitors per year. Visitors during the 2003 Ag Progress Days who sign the guest book will receive a special bookmark.

Tours can be scheduled from April 15 through Oct. 15 by calling (814) 863-1383, by sending an e-mail to pastoagmuseum@psu.edu, or by registering on the Web at <http://pasto.cas.psu.edu>.

Penn State's Ag Progress Days is conducted at the Russell E. Larson Agricultural Research Center at Rockspring, nine miles southwest of State College on Rt. 45.

For more information, call (800) PSU-1010 toll-free until Aug. 21 or visit the Ag Progress Days Website at <http://apd.cas.psu.edu>.

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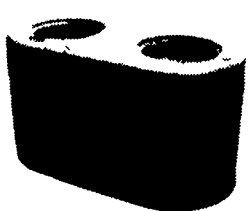
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