

# *The Meristem*



Department of Botany and Plant Pathology  
2005 Annual Newsletter



**PURDUE**  
UNIVERSITY

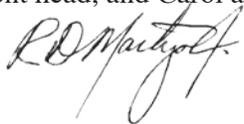
# WELCOME

I am sorry that this edition of *The Meristem* is later than usual. It has been a hectic year with a lot of changes in the department. 2005 was, once again, a very strong year for the department and many exciting things happened. It also marks my departure as head of the department. Effective December 31, 2005, after 8 ½ years as head, I stepped down to assume a new role at Purdue - director of the new Center for Crop Biosecurity and Invasive Plant Pests. This is an exciting opportunity for me and Purdue, and I look forward to the challenge of establishing a new center on campus. Dr. Tom Jordan assumed the interim head position in January and in May 2006, Dr. Peter Goldsbrough became the 11th head of the department. Peter was a faculty member in the Department of Horticulture and Landscape Architecture at Purdue.

Two new faculty joined our department in 2005. Dr. Michael Zanis, assistant professor (evolutionary plant biology) came in the fall. Michael completed his Ph.D. degree at Washington State University in 2002, and then held a 1-year post doctoral position at the University of Missouri and a 2-year NIH post-doctoral fellowship at the University of California, San Diego. Dr. Janna Beckerman, assistant professor and Extension plant pathologist joined our department during the summer. She completed her Ph.D. in plant pathology at Texas A&M University in 1997 and completed a 4-year post-doc at the University of Minnesota and then 4 years as an extension plant pathologist in Minnesota. We are extremely pleased to have these outstanding individuals join our department.

Two of our outstanding alumni received honors. Dr. April Mason (M.S. Botany and Plant Pathology) was honored with a Distinguished Agricultural Alumni Award in April 2005. This is the highest honor the College bestows upon one of its alums. Dr. Mason currently is Dean of the College of Applied Human Sciences at Colorado State University. Also, Dr. Tom Wolpert (M.S. and Ph.D. Botany and Plant Pathology) received the Noel Keen Award for Research Excellence in Molecular Plant Pathology from the American Phytopathological Society at their annual meeting in Austin, TX. Tom is a professor at Oregon State University. Congratulations to both April and Tom. Other highlights include the promotion of Dr. William Johnson to associate professor with tenure; recognition of the Soybean Rust Action Team with the PUCESA Team Award; the department's Sustained Achievement in Excellence Award to Dr. Robert Pruitt; the Exemplary Service Award to John Cavaletto; and several graduate student awards. In addition, Dr. Paul Pecknold retired after a 32 year career in the department. Paul and Chris, his wife, have moved to sunny California and we wish them all the best. You can read more about all of these outstanding individuals and others elsewhere in this issue. On a sad note, four of our Emeritus Professors passed away in 2005/06: Dr. Don Scott, Dr. Kirk Athow, Dr. James Williams, and Dr. Marvin Schreiber. Also, you may recall that one of our undergraduate students, Sarah Kessans, was competing in a 3,000-mile trans-Atlantic Ocean rowing race last fall. I am sorry to say that their boat, *The American Fire*, capsized in a storm about half way across the Atlantic. They spent a terrifying 16 hours clinging to the hull until rescued. Fortunately, both Sarah and Emily were in good health and spirits, although a bit shaken up by the experience.

In closing I want to say that my years as head of this great department have been truly rewarding for me. I am immensely proud of the many accomplishments made possible by the dedication and hard work of everyone. I have tried to capture a few of those accomplishments during the last 8 years in graphic form on pages 34 and 35. Many other such metrics attest to the greatness of this department. There are many things that I will miss, but perhaps what I will miss most is my interactions with all of the great people and the incredible group of graduate students that have come and gone. I know our students are among the very best prepared and will be leaders in their respective fields in the near future. Purdue University's strategic plan set the goal of becoming a preeminent university. The dictionary defines preeminent as "to be outstanding; to stand out." Based on that, I certainly believe the Department of Botany and Plant Pathology has attained preeminence and is poised for even greater accomplishments in the future. It has been an honor to serve as department head, and Carol and I wish one and all best wishes for continued success.



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## *Dr. Don Huber*

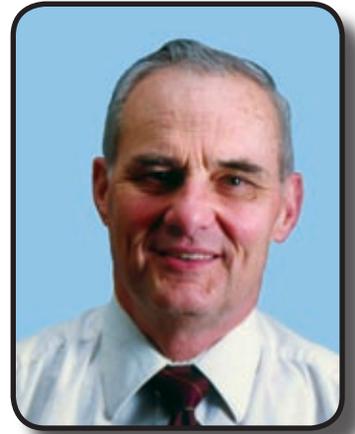


### Professor of Plant Pathology

**B.S. - University of Idaho**

**M.S. - University of Idaho**

**Ph.D. - Michigan State University**



Dr. Huber received his B.S. and M.S. degrees from the University of Idaho, his Ph.D. from Michigan State University, and specialized education at the Industrial College of the Armed Forces and National Defense University. He served eight years as Cereal Pathologist at the University of Idaho before joining the Purdue University Botany and Plant Pathology Department in 1971. His research encompasses cultural and biological control of soilborne diseases, soil microbial ecology, physiology of disease, and host pathogen interactions. He is internationally recognized for his research on nutrient-disease interactions. Much of his research emphasis on nutrient-disease interactions stems from research started 50 years ago evaluating the effect of crop residues and crop sequence to understand how crop rotation affects disease incidence and severity. The overall goal has been to enhance crop production efficiency through improved disease control. Answers to this question have come through patient research, graduate student support, interdisciplinary cooperative research, and interactions with U.S. and other scientists in Argentina, Australia, Brazil, Chile, China, Costa Rica, Denmark, England, Germany, Honduras, Iraq, Japan, Kenya, Mexico, South Africa, and New Zealand.

Extensive studies of microbial interactions in rhizosphere and bulk soil affected by various cultural practices that affect disease severity have characterized competitive, synergistic, and commensal microbial relationships that affect soilborne diseases as well as antagonistic interactions involved in lyses and hyperparasitism of fungal pathogens. Several effective chemical and cultural disease controls have little effect on the active population of soilborne pathogens, but change the soil microbial balance by inhibiting manganese and nitrogen oxidation (nitrification) or increasing copper and zinc uptake to enhance plant resistance or inhibit pathogen virulence.

Dr. Huber's research on crop rotation and other cultural mechanisms to control disease has shown that

the common factors affecting disease involve changes in nutrient availability for the plant, pathogen, or biotic environment. A multiple-component analysis of this information has been used to develop unifying concepts so that these factors can be managed for improved disease control. His research correlated the crop sequence effect (effect of the previous crop) with the rate of nitrification in soil, a microbiological process that determines the predominant form of nitrogen ( $\text{NH}_4^+$  or  $\text{NO}_3^-$ ) available for a subsequent crop. A group of diseases was shown to be reduced by nitrate-N and another group of diseases by ammonium-N. Those diseases reduced by nitrate were previously grouped as "low pH diseases" and those reduced by ammonium were grouped as high pH diseases because they were more or less severe depending on soil pH. The effect of pH on nitrification was consistent with these groupings, and the "form of nitrogen" hypothesis was developed.

Dr. Huber's collaborative research to develop commercial nitrification inhibitors (nitrapyrin, "N-Serve"; etridiazole, "Dwell"; methyl pyrazole, "DMPP") to improve nitrogen efficiency by reducing leaching and denitrification losses has provided a tool to implement this hypothesis in practical agricultural operations. Although most crops can use the ammonium or nitrate form of nitrogen equally well nutritionally, each form is metabolized differently. The ammonium form is metabolized the most efficiently, but nitrate may be stored in tissues and metabolized later. By inhibiting nitrification, there is a higher proportion of ammonium available for plant uptake and greater diversity of compounds in root exudates to support beneficial rhizosphere microorganisms. Essential nitrogen intermediates for foliage-infecting obligate plant pathogens (rusts, mildews) are more abundant with nitrate than ammonium, and nitrogen fertilizer rate effects on these diseases are most pronounced with nitrate fertilizers.

Inhibiting nitrification of animal manure not only increases its nutrient value for crops, but also nullifies its predisposing effect on corn to stalk rot so that growers

were encouraged to use manure as a valuable fertilizer resource rather than a disposal problem. Stalk rot was shown to result from late-season nitrogen deficiency that then induced a carbon (energy) deficiency as the plant cannibalized physiologic proteins (Rubisco and PEPCarboxylase enzymes) and protective structural nitrogen components (hydroxyproline in cell walls) as nitrogen sources for the developing kernel. Inhibiting nitrification provided late-season nitrogen for root uptake, reduced senescence and stalk rot severity, and protected physiological functions and structural integrity by preventing cannibalization that rendered the tissues susceptible to extra-cellular macerating enzymes of the pathogens.

Take-all root, crown, and root rot of cereals is a major yield-limiting disease of wheat in Indiana and worldwide. In the early 1970's, Dr. Huber sought a "common factor" in the voluminous empirical information that had been developed over the 150 years of research on take-all in order to provide a unifying concept that could be used to control this disease. A systematic, multiple component evaluation of the various plant, pathogen, abiotic, and biotic factors affecting take-all the following 10 years provided a unifying concept around the essential micronutrient manganese. This concept has been extended to understand pathogen virulence mechanisms, plant resistance, cultural disease control, and biological control of this and numerous other soilborne and foliar diseases.

The ability of organisms to oxidize manganese from the plant available Mn+2 form to the non-available Mn+4 form was demonstrated as a virulence factor for pathogens. Isolates of *Gaeumannomyces graminis* (Ggt, take-all), *Magnaporthe grisea* (rice blast), and *Streptomyces scabies* (potato scab) that don't oxidize manganese at the infection court are all avirulent. Isolates of Ggt, differing in their ability to oxidize manganese at different temperatures, are virulent only at those temperatures where they can oxidize manganese. Sulfide and other compounds that inhibit manganese oxidation by the pathogen can block virulence without inhibiting growth. Mutant isolates

differing in their ability to oxidize manganese were also used to verify manganese oxidation as a pathogen virulence factor.

Cooperative research with Dr. Darrell Schulze in Agronomy pioneered the use of high energy x-ray fluorescent spectroscopy (XRF, XANES) to non-destructively study nutrient distribution in plants during infection and pathogenesis. Oxidation of manganese occurred adjacent to ectotrophic hyphae of Ggt on

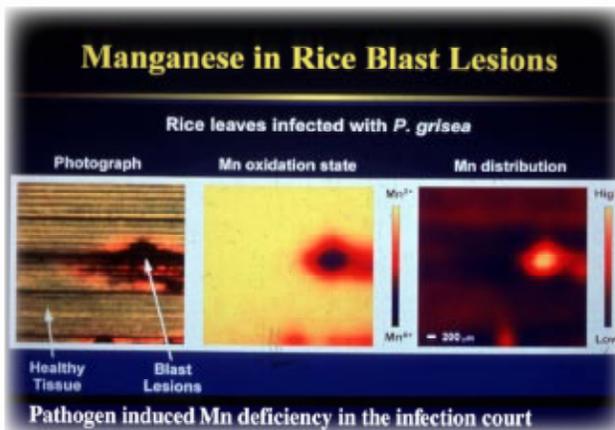


Dr. Don Huber at the first five-year State Review of the take-all control project in North Central China in 2005.

wheat roots and manganese oxide precipitated in intercellular spaces and root hairs prior to hyphal penetration. Oxidized manganese accumulated in disease lesions. Manganese oxidation occurs during appressorium formation with *M. grisea* on cereal (rice) leaves and continues during pathogenesis to result in the accumulation of manganese oxide in the lesion. This reaction

is facilitated by chelation of manganese with this pathogen's non-specific toxins (alpha picolinic acid and piricularin) that mobilize manganese from adjacent tissues to the infection court. Immobilization of manganese as manganese oxide in the infection court limits the physiological availability of manganese as a

co-factor in the shikimate pathway (phenylalanine ammonia lyase, lignification, phytoalexins, etc.) necessary for plant defense reactions.



Cultural and environmental conditions that affect manganese availability have a predicted effect on disease. Those conditions (such as high pH and NO<sub>3</sub>-N) that favor manganese

oxidation increase take-all, rice blast, scab of potato, Verticillium wilt, and Phymatotrichum root rot; while those conditions that increase manganese availability for the plant also reduce these diseases. Evaluation of over 200 organisms proposed for biological control of take-all or plant growth promotion showed that they all could reduce manganese. Seed treatment with manganese oxidizing organisms increased severity of these diseases in the field. Manganese availability between pH 5.2 and pH 7.8 is determined by the

Continued on Page 7

## Dr. Sue Loesch-Fries



Associate Professor of  
Plant Pathology

B.S. - Washington State University  
Ph.D. - University of Wisconsin, Madison



Dr. Sue Loesch-Fries is an associate professor of molecular virology with research and teaching interests in the areas of plant virology and introductory plant pathology. She came to Purdue with a B.S. from Washington State University in biochemistry and a Ph.D. from the University of Wisconsin-Madison in plant pathology. She had postdoctoral training in industry, during which she developed protoplast systems for the study of plant viruses and research experience in industry, where she led the team that developed virus-resistant alfalfa, one of the first disease-resistant transgenic crops. Her research at Purdue focuses on the genetic organization of plant viruses, virus interactions with host plants, and molecular approaches to control disease.

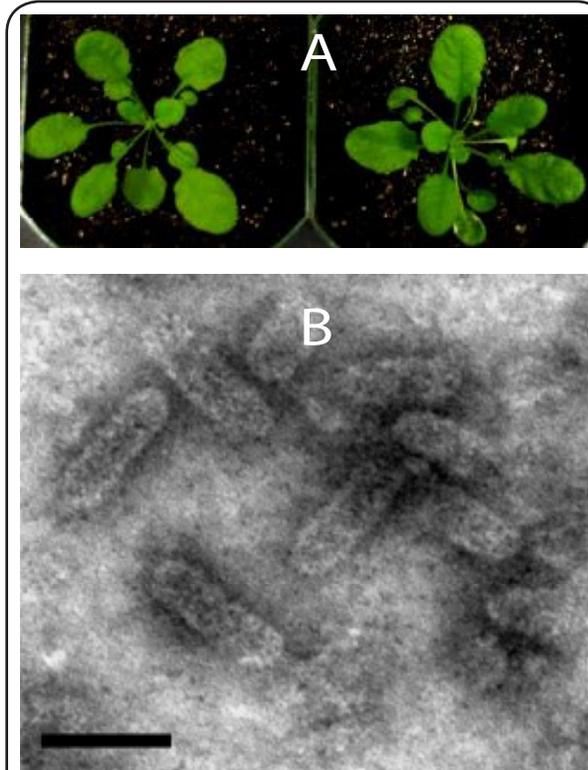
Viruses are the stripped down minimalists in the world of plant pathogens. Most of the viruses that infect plants are quite simple in structure compared to the majority that infects animals and contain only the necessary components for virus replication, assembly of particles, and movement throughout the infected plant. In fact, the simplest of viruses possess only the information to make a few proteins, each of which has multiple roles in the virus life cycle. However, viruses alone still lack the means to survive and must usurp

host components to provide additional functions. To understand the interactions between virus and host, the Loesch-Fries lab is investigating *Alfalfa Mosaic Virus* (AMV) infection of the model plant, *Arabidopsis thaliana*. AMV is typical of many plant viruses, but it has several unique advantages for study. First, it causes

significant yield losses in alfalfa and barrel medic throughout the world, so that an increased understanding of AMV replication could be applied to disease control in these important forage crops. Second, its mode of replication has an unusual twist in common with the viruses that infect fruit trees, so that new information on AMV will also increase our understanding of fruit tree viruses, which are difficult to study. And finally, it infects *Arabidopsis*, so that host factors that are important for replication can be identified, followed by the identification of similar genes in economically important hosts.

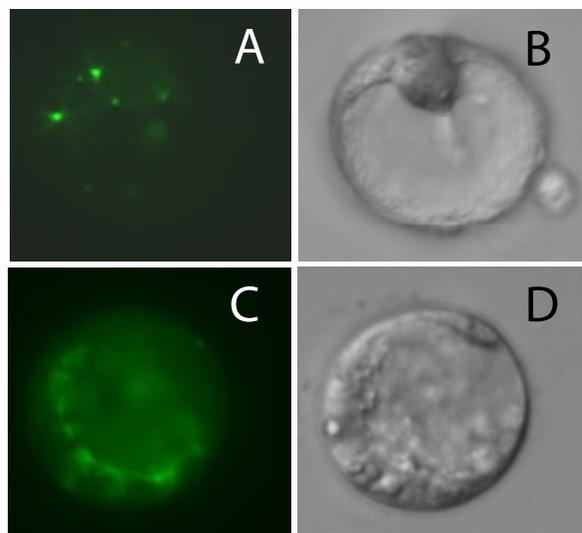
In an effort to understand how AMV interacts with its hosts, graduate student, Muthu Balasubramaniam, is cataloguing host proteins that interact with AMV proteins during infection. His work is focusing on identifying the *Arabidopsis* proteins

that interact with the protein that makes up the virus particle, called CP (coat protein). Host interactions with CP likely occur as soon as virus particles enter the plant cell and may well determine the outcome of the virus assault on the plant. Experiments are now underway to confirm the interactions in plants and to determine their role in AMV replication.



AMV infection in *Arabidopsis*. A. AMV-infected *Arabidopsis* plants (right) remains as healthy-looking as uninfected control plants (left). B. AMV virions purified from infected *Arabidopsis* plants inoculated with AMV RNA. The scale bar represents 50 nm.

An understanding of the cellular location of virus replication may open up novel possibilities for virus control. To determine the location of AMV multiplication, graduate student, Amr Ibrahim, constructed hybrid genes for the AMV proteins involved in replication. The sequence of each protein was fused with the sequence of the green fluorescent protein



Expression of one of the AMV proteins fused to the green fluorescent protein (GFP) in Arabidopsis protoplasts. A and B. Expression of only one of the hybrid virus proteins involved in replication. C and D. Expression of this protein along with other nonfluorescent AMV proteins AMV replication indicating the location of the virus factories. The images in A and C show the fluorescence of GFP as observed in a microscope; B and D show images of the corresponding protoplasts under bright light.

*Huber continued from page 5*

rhizosphere microflora as shown by gamma irradiating soil. Oats, as a precrop to wheat, reduces take-all by the toxic effect of glycoyanide root exudates on manganese oxidizers that change the microbial balance for a subsequent wheat crop. Crops such as corn tend to favor manganese reduction and leave twice the residual available manganese as soybeans for a subsequent wheat or soybean crop. Glyphosate in root exudates, on the other hand, is toxic to manganese reducers and stimulates manganese oxidation in the rhizosphere to predispose soybeans to *Corynespora* root rot and a subsequent wheat crop to take-all.

The unifying concepts obtained through a multiple component analysis of the plant, pathogen, abiotic environment and biotic environment have also been applied to develop effective “biological buffering” (disease suppressive soils) through crop sequence against soilborne diseases of wheat, corn, sorghum, potato, sugar beet, peppers, and rice in newly cultivated soils in the U.S., Brazil, and China.

gene so that the hybrid proteins become fluorescent when expressed in plant cells or protoplasts and can be detected using a microscope. Preliminary results suggest that each virus protein when expressed alone goes to a separate cellular location; however, when expressed together they cooperate to form virus replication factories. Experiments are underway to determine what brings the proteins together and whether host proteins co-localize.



Loesch-Fries Lab: (L to R) - Amr Ibrahim (Ph.D. student), Dr. Sue Loesch-Fries, and Muthukumar Balasubramaniam (Ph.D. student).

### Visiting Moroccan Scientists and Purdue Researchers Exchange Knowledge through Borlaug Fellows Program

Three Borlaug Fellows were welcomed to Purdue from Morocco in early February. The three fellows are all plant disease diagnosticians who hold senior level positions in the Ministry of Agriculture in Morocco. Two are virologists and one is a fungal disease specialist. Ms. Mariam El Akel is responsible for plant health and the Agricultural Warning Section in Rabat. Ms. Nezha Khaless is in charge of studies and phytosanitary applied research. She is also responsible for plant virus diagnosis in the city of Fes (Saiss region). Ms. Jamila Wadjinny is located in the city of Kenitra and is responsible for the diagnosis of pests, especially plant viruses in Gharb area.

More detailed information on their visit is available in the International Highlights section on page 30.



Moroccan Scientists (L to R) - Ms. Nezha Khaless of Fez, Morocco, Ms. Marian El Akel of Rabat, Morocco, and Ms. Jamila Wadjinny of Kentira, Morocco

# RESEARCH HIGHLIGHTS

## Research in Pruitt's Laboratory Refutes Inheritance Laws That Have Been Accepted for More than 100 Years

Dr. Robert Pruitt's recent research paper in *Nature* (434:505-509) received incredible exposure within the global scientific community in 2005. It received the highest ranking by the Faculty of 1000 and as one reviewer commented: "This is a fascinating paper that proposes a new non-DNA and non-Mendelian mode of inheritance that may profoundly change the foundations of genetics."

Once scientists understand more about the mechanism, they then may be able to manipulate it to modify genes already in plants and animals in order to correct mutations that cause diseases and abnormal growth.

Though further research is required to learn how this form of inheritance happens and how it can help improve plants or animals through gene therapy, Pruitt said the discovery has opened an important new line of thinking.

Other researchers involved with this study were Dr. Susan Lolle, A Purdue research scientist who is currently at the National Science Foundation, Jennifer Victor, a former Purdue graduate student now at Butler University, and Jessica Young, a laboratory technician in Pruitt's laboratory.

There is a PBS NOVA special planned on genetics that will include highlights of this work. This is the first paper published in *Nature* by a faculty member in this department.



This mutant plant has a malfunctioning gene that prevents its flowers from opening. Pruitt's lab found that 10 percent of the offspring of two such mutant plants don't have this malformation, but rather are like the normal grandparents. This chain of inheritance defies accepted scientific beliefs.

Excellence Through Diversity

## Early Detection of Asian Soybean Rust Imperative

Experts believe that winds from Hurricane Ivan in the fall of 2004, transported the soybean rust spores to the United States from South America. In November 2004, Asian soybean rust was identified for the first time in the U.S. in Louisiana. After the initial confirmation in Louisiana in November 2004, this disease was confirmed in eight other states, including Florida, Georgia, Alabama, Arkansas, Mississippi, Missouri, South Carolina, and Tennessee. The fungus survived the winter in Florida and then began spreading across the South.

Tracking the movement of the disease was a task that scientists and farmers handled jointly in 2005. **The Plant and Pest Diagnostic Laboratory** is geared up to assist growers in the identification of Asian soybean rust. The P&PDL and the Indiana Soybean Board declared the early identification of soybean rust a top priority. The ISB is underwriting the handling fee for samples of suspected soybean rust sent to Purdue from farmers and others in agribusinesses within Indiana. Departmental plant pathologist, **Dr. Greg Shaner** said that early detection was imperative. This disease could cause economic losses nationally as high as two billion annually.

Information on Asian soybean rust can be found on the following websites:

[www.pmdl.purdue.edu](http://www.pmdl.purdue.edu)

[www.aganswers.net](http://www.aganswers.net)

[www.usda.gov/soybeanrust](http://www.usda.gov/soybeanrust)

[www.agriculture.purdue.edu/soybeanrust](http://www.agriculture.purdue.edu/soybeanrust)



Carrie Harmon (R) confirms symptoms of soybean rust in a plot in Florida in July 2005. Harmon (M.S. 2002) is an Extension assistant in the Department of Plant Pathology at the University of Florida.



The same plot three months after the confirmation of Asian soybean rust.

## Researchers Find Key to Rice Blast Fungus

The fungus, *Magnaporthe grisea*, causal agent of rice blast, is the most deadly of the pathogens that attack rice. It can reduce yields by as much as 75 percent and has the potential to deprive about 60 million people a year of food. Rice blast is a main problem in Asia and Latin American where rice is an important food staple. About two-thirds of the people in the world rely on the grain, according to the USDA.



Jin-Rong Xu (pictured above) and his research team hope their research will lead to new fungicides or rice plants that are resistant to rice blast fungus.

**Dr. Jin-Rong Xu**, along with his graduate students, **Xinhua Zhao** and **Yangseon Kim** and former post-doctoral associate, Dr. Gyungsoon Park, have identified an enzyme that is a key player in coordinating the fungus' attack. The enzyme, called a pathogenicity mitogen-activated protein (MAP)

kinase, flips the switch that starts the cellular communication necessary to initiate the fungal invasion that kills rice plants or causes loss of grain. They found that a pathway, which includes three genes that form a cascade of communication events, drive the infection process. They reported that when they blocked the genes, the fungus couldn't develop appressoria and infect the plant. The pathway holds enormous potential of being used to produce new fungicides or new resistant rice plants to hold this pathogen at bay. An important area of future research will be to learn the interaction among several signaling pathways in the rice blast fungus that allows the pathogen to communicate with the plant. This study was published in the May 2005 issue of *Plant Cell* and was funded by grants from the USDA Agriculture National Research Initiative and the National Science Foundation.

## The Department of Energy Selects Banks and Goodwin to Lead Genetic Research Projects

In 2005, only 25 genome projects in the Community Sequencing Program were selected to be funded by the Department of Energy. Of the 25 projects approved, two are being led by faculty in our department.

**Dr. Jody Banks** leads the study of an ancient Christmas-tree looking plant from a family known as a lycophyte that emerged more than 435 million years ago and is the living ancestor of all of today's seed-bearing flora. The earliest forms of lycophytes became the basis of our oil supply. "When you fill your gas tank, you fill it with these plants," Banks said. "They dominated the Earth's flora during the era that's called the Carboniferous Period because that's when today's carbon-based fuel sources began developing."



Jody Banks believes the genome of this plant, *Selaginella moellendorffi*, holds answers to how plants evolved.

**Dr. Steve Goodwin** heads the project on the fungus, *Mycosphaerella graminicola*, which causes major wheat damage worldwide. It is a member of a fungus family that spawns leaf-spotting disease in cereal plants, citrus, bananas, strawberries, and many other species. *Mycosphaerella graminicola* annually causes 50 percent wheat yield loss worldwide and a \$275 million loss in the U.S. wheat crop alone. "By knowing the genome, we can learn about host and pathogen interaction. If we understand the mechanisms this pathogen uses to infect crops, then we may be able to control many plant diseases," Goodwin said.

These researchers will approach the goals of these projects by learning what genes do in both the fungus and the plant. They also want to know which genes from ancient organisms still exist in modern plants and animals, and are shared with other species.

The Community Sequencing Program gives scientists worldwide access to large-scale sequencing at the Joint Genome Institute in Walnut Creek, California for projects that the agency believe have significant scientific merit.

# RESEARCH HIGHLIGHTS

## Carole Lembi Reunites with Former Students and Post-Doc in 2005

Trips to Vicksburg, MS, San Antonio, TX, and Chicago, IL, plus a visitor in the summer, reunited Carole Lembi with several of her former students and postdoc in 2005. Here is a rundown on what they are all doing, in chronological order of their stay here at Purdue.

**Dr. David Spencer** received his Ph.D. from Notre Dame University and was a postdoc here in the early 70s. He then taught at IUPUI before moving on to his current position as USDA-ARS Ecologist at the University of California, Davis. He mostly works on the ecology of aquatic and invasive plant species, but he and Dr. Lembi have a joint project on the study of algae in California rice fields. He is also her supplier of chocolate-covered prunes!



Current and former students and post-doc pose for a picture at the Aquatic Plant Management Society Meetings in the summer of 2005. (L to R) - Clay Britton, Dr. Michael Netherland, LeeAnn Glomski, Dr. Linda Nelson, and Dr. David Spencer.



Sally Leva and husband, David, traveled from Delaware to West Lafayette to visit the Lembi lab.

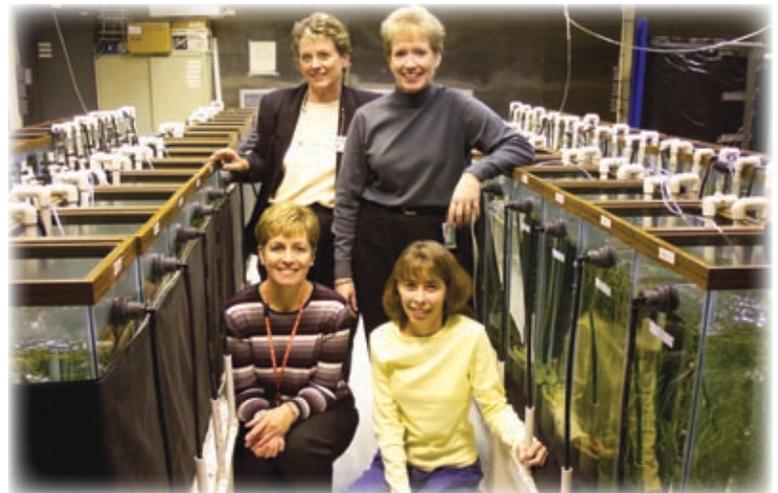
**Sally Leva** (M.S. 1979) and her husband David (Ph.D. in entomology) visited Lembi's lab during the summer of 2005. Both Sally and David work for DuPont in Wilmington, DE, where she is a senior ecotoxicologist in the Haskell Laboratory for Health and Environmental Studies. Sally supervises the aquatics laboratory, conducts environmental risk assessments, and is the study director and monitor for environmental studies.

**Dr. Michael Netherland** (M.S. 1989) is a research biologist with the U.S. Army Engineer Research and Development Center, and is stationed at the University of Florida Center for Aquatic and Invasive Plants in Gainesville, FL. After graduating from Purdue, Mike worked with the Corps, received his Ph.D. from the University of Florida, worked with SePro Company in Carmel, IN, and then returned to the Corps to continue research in aquatic plant management. Mike is the editor of the Journal of Aquatic Plant Management.

**Sally Yost** (B.S. in Crop Protection 1995) worked for both Dr. Lembi and Dr. Ross as an undergraduate. Sally is a contract scientist with the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, MS. She received her M.S. from Louisiana

State University in environmental science in 2004. She works on the fate and transport of military contaminants in the environment. As she says "It's a very exciting job because we get to blow things up!" That's our Sally!

**Joe Marencik** (M.S. 1999) worked for the Lake County (IL) Health Department's Lakes Management Unit, where he was a water quality specialist after obtaining his M.S. degree. In January 2004, he became the aquatic plant specialist at the Chicago Botanical Gardens, where he is responsible for the planning and implementation of the restoration of the lake shorelines to native plants. If you have ever gone to the Chicago Botanical Gardens you know that lakes are a major natural



While at the U.S. Army Corp of Engineers Waterway Experiment Station in Vicksburg, MS, this group gathers for a picture. Front (L to R) - Dr. Linda Nelson and LeeAnn Glomski. Back (L to R) - Dr. Carole Lembi and Sally Yost.

# RESEARCH HIGHLIGHTS

feature. Just this last summer Joe got to plant 500 water lilies in a brand new garden area and is now starting a renovation of the Japanese Gardens shoreline. Joe is the President of the Illinois Lake Management Association as well as its newsletter editor.



Joe Marencik enjoys being an aquatic plant specialist at the Chicago Botanical Gardens.

**Lee Ann Glomski** (M.S. 2000) is a research scientist for the U.S. Army Corps of Engineers. She works at the Lewisville, TX pond and mesocosm facility and loves living in Texas. She gave a great research paper at the annual Aquatic Plant Management Society meetings this summer on “Evaluation of aquashade dye for growth inhibition of submersed aquatic vegetation.”

**Dr. Linda Nelson** (Ph.D. 2001) returned to the Army Corps of Engineers Waterways Experiment Station in Vicksburg, MS after graduation. Her official title is plant physiologist, and in addition to her research duties in aquatic plant management, she is secretary and newsletter editor for the Aquatic Plant Management Society.

We also had the privilege of visiting with **Janice Kees** and her sons, Joshua and Daniel, in Vicksburg, MS (Stewart Kees, Ph.D. 1998). They are doing great. Janice teaches career technology at Warren Central High School, and Joshua and Daniel are straight A students in the 7th and 5th grades, respectively. We know their dad is proud of them all.



The Kees Family (L to R) - Joshua, Janice, and Daniel.

**Katie Wilkinson** (Ph.D., July 2005) married Joe Flaherty, and they are both teaching at Coker College in South Carolina. And current student, Clay Britton, continues to isolate DNA from toxic algae.

Dr. Lembi (lembi@purdue.edu) would love to hear from her other students, whether they are still in aquatics or not. She is proud of you all!

## Springfest 2005

More than 40,000 people came to the campus of Purdue University for Springfest 2005. Each year this event continues to draw record crowds. Purdue Agriculture originated the event and remains the largest exhibitor, but the event has gone campus-wide.

The Department of Botany and Plant Pathology continues to strongly support this annual showcase. Faculty, staff, post-docs, graduate students, and undergraduate students all participate in the outreach opportunity. The department hosts a variety of interactive displays and tables. Those attending learned about plant hair, mushroom madness, fungal feeding, and how plants are engineered. Many learned about spores at the display called “Spores Galore,” and then they checked out the perennial weeds and biotechnology exhibits. Then in the outside tent, the BTNY 211 (Plants and the Environment) students played a question and answer game and passed out stickers. Everyone also had the opportunity get their faces painted by our departmental artists and then receive a complimentary botany and plant pathology balloon. The graduate students always host a wonderful food tent, selling brats, hot dogs, chips and drinks to raise money for travel grants.

Hope to see you all next year!



# FACULTY HIGHLIGHTS

## Pecknold Surprised by Retirement Celebration

A week before his last day in the Department of Botany and Plant Pathology, Paul Pecknold was scheduled have an exit interview with department head, Ray Martyn. Paul was adamant about not having any kind of retirement celebration, he wanted to leave quietly. So we had to resort to stretching the truth a little. Ray actually got Paul into his office and talked for a short time and then Paul and Ray came to the botany lab where the department waited to surprise Paul with a little celebration. It worked! He was very surprised and was a good sport about it.

Paul Pecknold grew up in Canada and completed his graduate studies in California before coming to Purdue in 1973. He started and ended his Purdue career in the Department of Botany and Plant Pathology as an Extension Plant Pathologist for fruit crops and ornamentals. He served Indiana and the midwest fruit industry in many ways during that 32 year period. He was honored in early 2005 by the Indiana Horticultural Society with a "Career Recognition Award."

Paul also contributed heavily to teaching. In the fall semester, he taught BTNY 301, Introductory Plant Pathology, and BTNY 515, Diseases of Fruit Crops. In the spring semester he was responsible for BTNY 518, Diseases of Trees and Shrubs and BTNY 519, Diseases of Greenhouse Ornamentals. In the summer session, Paul taught BTNY 605, Diagnosis of Plant Disease. Paul actually taught BTNY 605 on his last day in the department. He was selected in 2003 as the Department of Botany and Plant Pathology's Outstanding Teacher. He was a very popular and respected teacher who will be greatly missed.

Paul and his wife, Chris, and their dog, were packed and ready to go a week after his retirement. They headed to sunny southern California where they have purchased a home to spend their retirement years. Paul said they have many places they want to see now that they have the time to do so. They will miss their children and grandchildren, but plan to come back to Indiana to visit often.



Paul Pecknold reacts to the surprise retirement celebration.



Ray Martyn prepares to present Paul with a few gifts from the department. Paul is getting a little anxious to open a "special departmental gift."



Paul is very pleased to receive the coveted "Botany Mug."



Bill Johnson congratulations Paul on his retirement at the surprise celebration.



Steve Hallett and Sandy Bohl share a few minutes with Paul.



Paul received a Wine-of-the-Month club certificate. He needed something to put in his "Botany Mug!"

# FACULTY HIGHLIGHTS

## Two New Faculty Join the Department in 2005

**Dr. Janna Beckerman** is the new extension fruit and ornamentals pathologist in the department. Janna was born and raised in Ohio, and received her B.S. and M.S. degrees at the State University of New York College of Environmental Science and Forestry, and her Ph.D. from Texas A & M University.



Janna comes to us from the University of Minnesota where she was an extension plant pathologist focusing on all things horticultural. Here at Purdue, her research will focus on evaluating the incidence and prevalence of fungicide resistance in Indiana orchards, nurseries, and greenhouses. She will also serve as an Extension contact for the community, industry, and county Extension agents.

Janna's appointment also has a teaching component. Two weeks after arriving on campus, Janna began teaching BTNY 301, Introductory Plant Pathology. With over 50 students in her class and an experienced teaching assistant, she hit the ground running and isn't looking back. In the spring 2006 semester she will also be teaching BTNY 518, Diseases of Trees and Shrubs.

Janna comes to the West Lafayette area with her daughter, Noa, and their two dogs. They are getting settled into their new home where Janna is an avid gardener, blessed with what can only be referred to as "The Black Thumb of Death!" Anyone that has seen her garden realizes that she went into plant pathology due to her natural gifts.

Janna Beckerman is located in Lilly Hall, Room 1-321. Her phone number is 49-44628 and her email is [jbeckerm@purdue.edu](mailto:jbeckerm@purdue.edu).

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The department is pleased to welcome our new plant evolutionary developmental biologist, **Dr. Michael Zanis**. Dr. Zanis joined the department in early August 2005.



Michael Zanis was born in Augsburg, Germany, grew up in several different states, but spent much of his life in Alaska, where his parents still live. He received his B.S. in biology from the University of Massachusetts at Dartmouth in 1995, and his Ph.D. in botany, with a minor in statistics, from Washington State University in 2002. After being awarded his Ph.D., he began as a NIH post-doctoral research associate at the University of California, San Diego in the laboratory of Dr. Robert Schmidt.

At Purdue, Michael's research will focus on the evolution of development in a wide range of plants. He is especially interested in how developmentally important genes evolve and are regulated following a gene duplication event. Michael also has a strong research interest in phylogenetics/systematics and understanding mechanisms underlying plant diversity.

Zanis and his wife, Dr. Krista Nichols moved to West Lafayette in late July. Krista accepted a faculty position split between the Department of Biology and the Department of Forestry.

Michael loves flyfishing, including building flyrods and tying flies. Michael and Krista both enjoy getting outdoors to camp, hike, bike, run, and swim whenever they can!

Michael Zanis is located in Whistler Hall, Room B032. His phone number is 49-46606 and his email is [mzanis@purdue.edu](mailto:mzanis@purdue.edu).

# AWARDS & RECOGNITIONS

## Martyn Elected into Presidential Lineage of the American Phytopathological Society

**Dr. Ray Martyn** was elected vice president of the American Phytopathological Society (APS) in June 2005. The vice president is the first step in a three-year sequence to the presidency. The APS is the world's premier and largest (5000+ members) international professional society for plant pathologists. Martyn will serve as APS president during the centennial meeting in 2008. Prior to Martyn's election as APS vice president, he served as the Councilor for the North Central Division of APS (2002-05) and as vice president and president of the Southern Division of APS (1994-96). He has been a member of APS since 1976 and has served on numerous committees and boards for the society.



## Ray Martyn Honored with Distinguished Service Award

**Dr. Ray Martyn** was honored in February 2006 with the Indiana Crop Improvement Distinguished Service Award at the ICIA Annual Conference. This is a prestigious recognition, the highest individual tribute conferred by the organization.

Ray served on the ICIA's board of directors for nine years while serving as Head of the Department of Botany and Plant Pathology. He also was active on the Annual Conference Planning Committee helping organize, develop, and execute many outstanding sessions for their annual meetings. Ray added value to the organization, to the seed industry, and to agriculture in general, not only in Indiana, but well beyond with his many activities and achievement, nationally and internationally.

As a teacher, researcher, and administrator, he set high standards of performance for both graduate and undergraduate students, and faculty, and has helped them achieve those standards through personal mentoring. He continually seeks to increase his own knowledge and remain current in what is happening to today's research.

As Dr. Martyn assumes his new role as Director of the Purdue Center for Crop Biosecurity, the ICIA organization congratulates and thanks him for his contributions to the Indiana Crop Improvement Association.



## Faculty and Staff Honored for Service Anniversaries



*Dr. Dan Egel*  
10 years



*Dr. Steve Goodwin*  
10 years



*Debra Hall*  
10 years



*Debra Lubelski*  
15 years



*Mike White*  
25 years

# AWARDS & RECOGNITIONS

## PUCESA Honors Soybean Rust Team

Purdue Extension

Knowledge to Go

At the PUCESA Service Banquet Awards Ceremony, held on October 18, 2005, the PUCESA Team Award went to the Soybean Rust Team.

The team was made up of 18 members from four departments. The team members are: **Greg Shaner, Andreas Westphal, Scott Abney, Karen Rane, Gail Ruhl, Fred Whitford, Ray Martyn, and Amy Deitrich** (Department of Botany and Plant Pathology); Shawn Conley, Ellsworth Christmas, and Corey Gerber (Department of Agronomy); Corrine Alexander, Craig Dobbins, Chris Hurt, and George Patrick (Department of Agricultural Economics); Steven Leer, Kevin Smith, and Russ Merzdorf (Department of Agricultural Communications); and Jon Whiteman and Chris Novak (Indiana Soybean Board).

This group had the monumental task of rapid response in preparedness to a potentially disastrous soybean disease, and it could be said that his team actually extends beyond the names listed above. This program was highlighted by the smooth transition from threat to response that involved many resources and multiple agencies, including many Purdue agricultural educators, the Purdue Agricultural Centers, and the pest control industry. The level of public education was exceptional with many team members developing the most current information possible using multiple delivery methods. The amount of time, training, and travel devoted to this effort greatly exceeded the normal expectations of staff responsibilities. Rapid interactions with university, state, national, and international agencies effectively culminated in this timely and effective extension preparedness program. Congratulations to the Soybean Rust Team on this very deserving award.

## Johnson Promoted to Associate Professor

**Dr. Bill Johnson** was promoted to associate professor effective July 1, 2005.

Dr. Johnson's Extension programs in weed management are widely recognized regionally and nationally as being relevant and of high quality. He has published dozens of extension manuals, videos and CD-ROMs, educational materials in various media forms, web pages, and a whole host of regional reports and agriculture guides. His Extension training programs have impacted over 7,000 people in Indiana the last two years, and his websites have had over 30,000 hits. Bill is highly regarded by his peers and is considered among the very best early career weed scientists in the country. Bill is the quintessential team player and an outstanding faculty member.



## A/P Staff Receives Rank Advancement

**Mr. Richard Dirks** was promoted to rank 4 in the College of Agriculture's A/P Staff Advancement Program.

Rich is an integral part of the weed science program in our department. The 'science' of weed science has changed directions over the last decade and one of those changes has been towards precision agriculture. Rich has been instrumental in helping develop the use of remotely sensed data and GIS and GPS technology to further precision agriculture and weed management. He has been involved in virtually all aspects of the research for Dr. Kevin Gibson. He has worked with graduate students and attended professional meetings where he has presented his scientific research, and he has been co-author on several research publications.



# AWARDS & RECOGNITIONS

## Sustained Achievement in Excellence Awarded to Robert Pruitt

In November 2005, at the Annual Graduate Student/Post-Doc Poster Session, Dr. Ray Martyn announced the most recent recipient of the Sustained Achievement in Excellence Award, **Dr. Bob Pruitt**. Bob has done everything asked of him since arriving at Purdue in 2000. He is valued by his colleagues in the department, the college, and university and respected as a premier scientist nationally and internationally.

Bob came to Purdue in July of 2000, after spending eight years as an assistant and associate professor in the Department of Molecular and Cellular Biology at Harvard University and four years as an assistant professor in the Department of Genetics and Cell Biology at the University of Minnesota.

Bob's research has focused on the molecular genetic characterization of plant intercellular signaling processes that occur across the plant cuticle. This has included genetic analyses of both pollen-pistil interactions and post-genital organ fusion. As a Ph.D. student with Elliot Meyerowitz at Cal Tech, Bob was instrumental in developing *Arabidopsis* as a model plant system and published the first paper on the characterization of the *Arabidopsis* genome. The National Science Foundation has funded his research for an amazing 28 consecutive years, beginning with his pre-doctoral NSF fellowship in 1980 through his current 2005-08 NSF grant.

His most recent research paper in *Nature*, with colleague Susan Lolle and others, has received incredible exposure within the global scientific community. It received the highest ranking by the Faculty of 1000 and as one reviewer commented: "This is a fascinating paper that proposes a new non-DNA and non-Mendelian mode of inheritance that may profoundly change the foundations of genetics." There is a PBS NOVA special planned that will highlight a portion of this work. This paper is the first paper published in *Nature* by a faculty member in this department.

Bob Pruitt does much more than just great science. He is the quintessential faculty member. He understands what being a faculty member means. It means doing your share of teaching, which he does. He teaches two graduate courses, BTNY 504, Advanced Weed Science and BTNY 553, Plant Growth and Development and receives excellent student evaluations in both courses. In addition, he teaches an *Arabidopsis* molecular genetics course at Cold Spring Harbor each summer. Being a great faculty member also means mentoring graduate students. He currently serves as major advisor to five graduate students, a committee member for 24 more, and has supervised five post-doctoral fellows.

Another quality of the quintessential faculty member is giving service to the department and college and the broader university and scientific community. In this role Bob has served on 12 departmental committees, seven college committees, three interdisciplinary committees, and one university committee. In addition, he has served as the department's summer intern research program for the last two years. In all cases, Bob's leadership and work on these committees has been instrumental in their accomplishments.

Bob always gives freely and graciously of his time and expertise to students and the department. He truly understands what a good faculty member is. Dr. Bob Pruitt, the 2005 recipient of the Sustained Achievement in Excellence Award.



# AWARDS & RECOGNITIONS

## Cavaletto Receives the 2005 Exemplary Service Award

The second annual Exemplary Service Award was presented to **John Cavaletto** at the December holiday party. Dr. Ray Martyn presented John with an engraved plaque, a \$500 personal check, and a \$500 professional development grant.



John received his B.S. and M.S. degrees from our department in 1994 and 1997, respectively. He was hired into the newly created position of teaching laboratory coordinator. Without a clear vision of what this position should be, John helped it evolve tremendously, due to his extraordinary ability and dedication. As our laboratory classes grew in numbers, so did John's responsibilities. Any instructor will tell you, the quality of the laboratory experience is directly related to the quality of the preparation, and John takes great pride in seeing this through. On average, John is responsible for the coordination of 12-15 lab sections per semester.

As student numbers increased, so did our need for more teaching assistants. John also has evolved into the teaching assistant coordinator. He coordinates 10 TA's each semester and makes the lab assignments. John initiated weekly TA meetings to review each week's lab exercises so that each was understood by the TA's. He also established a TA evaluation protocol that helps ensure the TA's get feedback from the students on their performance. All of our TA's receive excellent evaluations from all of our classes, largely due to their commitment and to John's dedication to the students, his job, and our department.

Many of the faculty may not truly appreciate John's efforts, especially if they do not teach a class with a laboratory, but those who do know full well of his efforts. He helps keep them on track. John also has been selected as the department's Outstanding Service To Students Award recipient due to outstanding efforts as teaching coordinator. The faculty, staff, and students of the Department of Botany and Plant Pathology congratulate and thank John for his tremendous dedication.

## Amy Deitrich Receives Purdue's Mortar Board "Rose Award"

**Amy Deitrich** serves as the department's Extension secretary. She provides support to the Extension faculty and staff, coordinates outreach activities, assists in the operations of the P&PDL, and is the department liaison with the Office of International Students and Scholars, and all other duties that may come her way, which are many! She is an integral part of the daily operations of this department. She was nominated for the "Rose Award" by the Extension staff in recognition of her outstanding talents and attitude. Amy was honored with a dozen red roses, a certificate, and a small departmental reception.



Each year the Purdue Mortar Board accepts nominations for the "Rose Award" for clerical and service staff who have contributed above and beyond the call of duty and have positively changed the environment of the workplace. The committee received 23 nominations, and Amy was one of ten who received this honor. It is truly an honor to have Amy as a staff member in our department.

# AWARDS & RECOGNITIONS

## Johnson Elected Vice President of the North Central Weed Science Society

In December 2005 at the North Central Weed Science Society (NCWSS) meetings, **Dr. Bill Johnson** was elected as vice president of the regional society for a four-year term. He will serve as the program chair for the annual meeting during his second year and then as president of the society in the third year. In 2008 the society will meet in Indianapolis, and Bill will serve as the local arrangements chair for that event. Johnson has been an active member of the society since 1994. He served as the Newsletter and Communications Editor from 2000 to 2005.



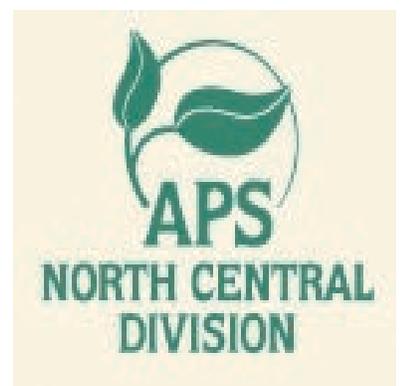
## Glenn Nice Serves as Electronic Communications Chair for the North Central Weed Science Society

For the past three years, **Glenn Nice** has served as the Electronics Communications Chair for the NCWSS. He is responsible for the collection and distribution of all presentations to the section chairs at the annual meetings. Glenn also maintains the listserv and uploads this information to the NCWSS website and does this nerve racking process without any glitches. Vice-President of the NCWSS, Bill Johnson, says that Nice works hard to serve the society and deserves the recognition.



## The North Central Division of the American Phytopathological Society Elects Beckerman to Vice-President Position

At the annual meeting in June 2005, the North Central Division of the American Phytopathological Society elected **Dr. Janna Beckerman** to serve as Vice-President during 2005-2006. She will assume the role of President for the 2006-2007 year. Also in June 2007, Beckerman will serve as the host of the North Central annual meeting, which will be held in West Lafayette. She has been an active member of the society since graduate school.



The North Central Division is the regional representation of the American Phytopathological Society for members who live in the geographical region of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and contiguous provinces in Canada.

## Rane and Beckerman Identify Deadly Mushrooms

In September 2005 **Dr. Karen Rane**, of the Plant and Pest Diagnostic Laboratory, and plant pathologist, **Dr. Janna Beckerman**, viewed a photo of three mushrooms sent to the P&PDL. The consumer had incorrectly identified them as shaggy manes (*Coprinus comatus*), when in fact, they were members of the Lepiotaceae and Amanitaceae, families that contain the deadliest mushrooms in North America. Two adults and one child had eaten these mushrooms, with one person already being sick. Beckerman and Rane were able to convince these people to go to the hospital for treatment and observation and all made a full recovery. The mushrooms were identified as *Lepiota naucina*, *Amanita thiersii*, and *Chlorophyllum molybdites*. Two of these fungi have been implicated in several deaths, and the third is of unknown toxicity.



# AWARDS & RECOGNITIONS

## Faculty and Staff Receive Well-Deserved Recognition for Contributions to Students

The following faculty and staff received departmental awards for their contributions to graduate and undergraduate teaching, counseling, and mentoring.

**Dr. Charles Wolshuk** received the Outstanding Graduate Faculty Mentor Award. Charles has the ability to get students to perform far above their own expectations. This is a mark of a true mentor. He is someone who works with his students every day, challenges them constantly, and instills in them a sense of pride and responsibility.



**Dr. Charles Woloshuk**  
Outstanding Graduate  
Faculty Mentor



**Dr. Kevin Gibson**  
Outstanding  
Undergraduate Teacher

**Dr. Kevin Gibson** was selected as the Outstanding Undergraduate Teacher in the department. Kevin has taught 10 courses at the undergraduate level in the last 4 years and co-teaches a course designed to prepare students for their Maymester experiences in Costa Rica and Trinidad/Tobago. He has developed three new and recurring courses over the last 4 years also. His effectiveness is evident in his course evaluations and the increase in enrollment in all of his courses. Kevin has mentored nearly a dozen undergraduate students over the last 4 1/2 years in his laboratory. He has and continues to serve on several department, college, and university committees related to education. He provides the leadership for the Tecumseh Project, a program designed to recruit and retain Native American undergraduate and graduate students at Purdue.

**Dr. Carole Lembi** received the Outstanding Undergraduate Counselor award. She serves as the lead counselor for the group of five academic counselors in the Department of Botany and Plant Pathology and advises one-third of our 22 students. She maintains regular office hours so that students can seek assistance with course work or counseling activities, she also makes herself available for Day On Campus students, Introducing Purdue students, and all other potential students who may drop in to visit. She has been a great recruiter for our department while teaching. She sparks interest in students with her teaching and many decide that our program is where they would like to continue their education and to have Carole as their academic advisor. She is our departmental Honor's Program Coordinator and also has been an advisor for undergraduate research projects.



**Dr. Carole Lembi**  
Outstanding  
Undergraduate Counselor



**John Cavaletto**  
Outstanding Service  
to Students Award

**John Cavaletto's** contributions to teaching in our department ensures that the students are very well served and that is why he was selected to receive the Outstanding Service to Students Award. John leads by example. He is responsible for the coordination of 12-15 lab sections per semester. As any instructor will tell you, the quality of the laboratory experience is directly related to the quality of the preparation and John takes great pride in seeing this through.

He is a very positive role model for undergraduate and graduate students alike. He serves as the coordinator of our departmental teaching assistants. All of the departments teaching assistants receive excellent evaluations from all of our classes, largely due to their commitment and to John's dedication to the students, his job, and our department. John goes above and beyond the job description and provides exemplary service to our department and all students.

# FACULTY MEMORIAL

## Professor Emeritus of Plant Pathology

**Donald H. Scott**

**1934 - 2005**



**Donald H. Scott** was born July 11, 1934, in Indianapolis, Indiana. He earned his B.S. degree in agricultural economics from Purdue University in 1956, and his M.S. and Ph.D. degrees in plant pathology from the University of Illinois in 1964 and 1968, respectively. He was a faculty member in the Department of Botany and Plant Pathology from 1968 until 1998. Don was named professor emeritus in 1998, after 30 years of service as professor of plant pathology. Don passed away on June 11, 2005 at a Lafayette hospital at the age of 70; he is survived by his wife, Jackie and their four children, Jeff, Pam, Patti, and Jim, and ten grandchildren.

During his 30 years in the department, Don directed graduate students and taught several plant pathology courses, but his appointment was primarily in Extension. Each year during the 1970's and 1980's he traveled the state with his colleagues, surveying the status of Indiana's crops in the spring and summer, and conducting educational programs on crop disease management during the winter. He was part of a team of individuals who brought the latest information and technology to farmers and agricultural business associates in all 92 counties. He was an essential resource for our network of county field staff and a valuable representative

of Purdue University. "Don was a great colleague, and a great person who cared about his work, cared about people, and cared about his family. There were three of us who worked in the area of Integrated Pest Management of agronomic crops," states Tom Jordan, assistant director of Purdue Extension and colleague of Scott's for more than 20 years. Jordan was in weed control, Rich Edwards was a specialist in insect control, and Don worked in plant diseases. They were known as the 'Weed, Worm, and Wilt Team.' During his eulogy, Jordan spoke of Scott's reputation as a nationally known plant pathologist who cared about his profession and about the tradition that was established by his predecessors and how Don worked to preserve the trust that the agricultural communities had in Purdue University.

Don received numerous awards for his accomplishments and efforts towards the advancement of Indiana Agriculture. He received the Crop and Soil Merit Award from the Indiana Crop Improvement Association in 1990; the Frederick L. Hovde Award of Excellence in Education Service to Rural People of Indiana in 1995; the Distinguished Service Award from the Midwest Regional Turf Foundation in 1996; the North Central Division of the American Phytopathological Society in 1998; the Indiana Farm Bureau Award for his service to agricultural Extension in 1998; and in 1999, Don received the Certificate of Distinction from the Agricultural Alumni Association. Don was most proud of the Certificate of Distinction and the Frederick L. Hovde Award of Excellence in Education Service.

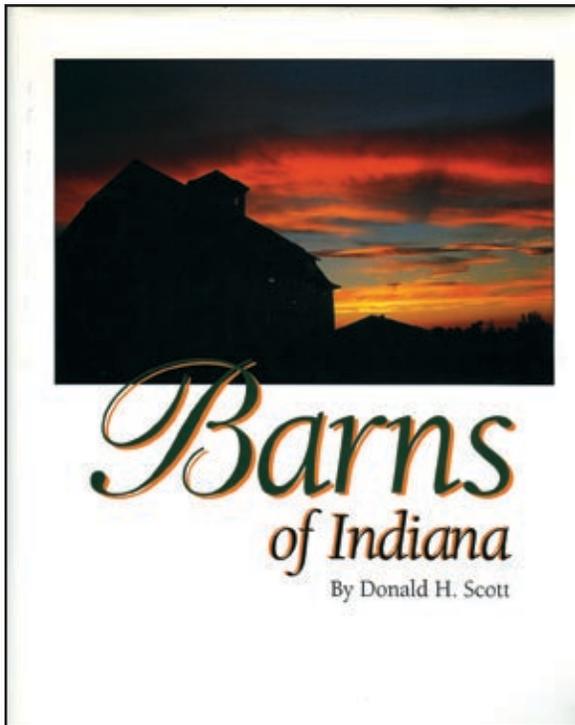
Scott was an active member in professional and scholarly societies including Epsilon Sigma Phi, The American Phytopathological Society, The Indiana Academy of Science, Sigma Xi, and Gamma Sigma Delta. He is listed in American Men and Women of Science, Who's Who in the Midwest, and Who's Who in Frontier Science and Technology.

He was an accomplished photographer. While traversing the state meeting with farmers, Scott took in the landscape. He always noticed the old barns. To save some memories of these old barns for his grandchildren, Don started taking his camera on his travels. He photographed barns built between the

mid-1800s and the mid-1900s, about 700 in all. Don combined his photography hobby with his deep connection with Midwestern agriculture to create *Barns of Indiana* and *Barns of Indiana, Volume II*. Both volumes continue to be extremely popular, with proceeds directed to the Purdue Ag Alumni Association.

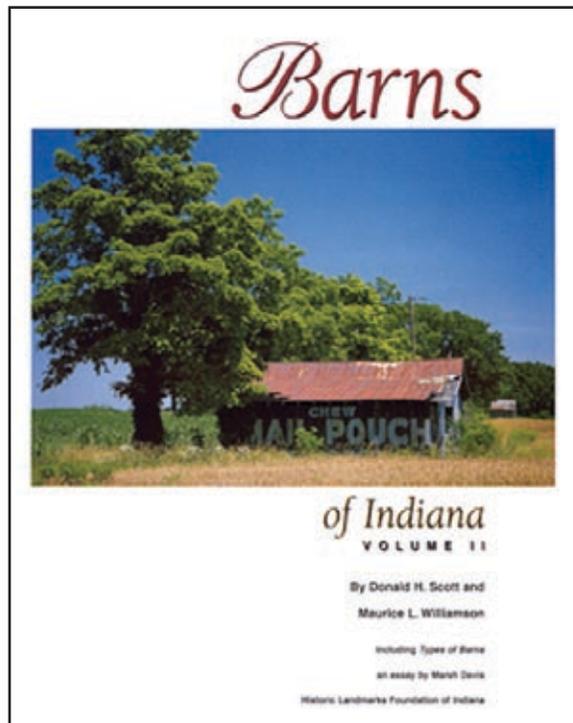
Photography wasn't Don's only hobby. He enjoyed fishing, golfing, bowling, mushroom hunting, and officiating high school football, which he did from 1979 to 1990.

"I am proud to have known Don and worked with him," Tom Jordan says. "We will all miss him."



*Proceeds from book sales have helped fund scholarships for more than 120 students.*

*Copies of Scott's books are available through the Agricultural Alumni Association  
715 W. State Street  
West Lafayette, IN 47907-2061 or you may contact Donya Lester at 765-494-8593 or via email  
lesterd@purdue.edu.*



# FACULTY MEMORIAL

## Professor Emeritus of Plant Pathology

**Kirk L. Athow**

**1920 - 2005**

Dr. Kirk Athow passed away December 4, 2005 in Tacoma, Washington. He is survived by his wife, Evelyn, a stepson and two foster daughters.

He was born January 22, 1920 in Tacoma. Dr. Athow graduated from Lincoln High School in 1938. After serving in the U.S. Army during WWII, he attended Washington State University and received his B.S. degree in 1946. He continued his academic studies at Purdue University in the Department of Botany and Plant Pathology. He was awarded a M.S. degree in 1946 and Ph.D. in 1951. After graduating he became an assistant professor in the Department of Botany and Plant Pathology at Purdue where he was a leading soybean plant pathologist until he retired as an Emeritus Professor in 1985.

Dr. Athow was very respected both at Purdue University and at Universidade Federal de Vicose, Brazil. In recognition of his distinguished career as a soybean pathologist at Purdue, a soybean cultivar was named in his honor. ATHOW was developed in the USDA-ARS and Purdue ARP cooperative soybean breeding and genetics projects. In 1998 1,000 soybean seeds from this cultivar were aboard the Space Shuttle Discovery where U.S. Senator John Glenn performed experiments designed by Dr. Rick Vierling from the Department of Agronomy.

The scientific community of the University of Vicosa awarded Dr. Athow an honorary doctorate degree in 1976. Brazil is an important producer of soybeans due to the scientific contributions and the fundamental international cooperation that Dr. Athow provided.



## Professor Emeritus of Weed Science

**James L. Williams, Jr.**

**1929 - 2006**

On January 1, 2006, Dr. James Williams passed away after a 34-year battle with Parkinson's disease. He is survived by his wife of 53 years, Alice Ayers Williams.

Dr. Williams was an Indiana native. Born in 1929 in Salem, Indiana, he graduated from Brownsville High School and attended DePauw University. He received his B.S., M.S. and Ph.D. from Purdue University in the late 1950's and early 1960's. Williams was a captain and a pilot in the Air Force during the Korean War, serving from 1951 to 1955. He remained in the Air Force Reserves until 1961.

He spent his 30-year career in the Department of Botany and Plant Pathology specializing in herbicide Extension and practical research. He was a consultant with the Cocoa Institute, Brazil from 1968 to 1978. He retired from Purdue University in 1986.



Dr. Williams was a widely recognized specialist in weed science, especially as it involved herbicides. He provid-

ed leadership in developing programs for growers, extension agents, pesticide dealers, and distributors. He was responsible for developing an exceptional demonstration-research program which provided the basic information needed for herbicide recommendations in Indiana.

Williams was awarded the Senior and Career Awards from the Purdue University Cooperative Extension Specialist Association in 1976 and 1983 respectively. He was a member of Epsilon Sigma Phi Honorary Extension Fraternity, Alpha Zeta Honorary Agriculture Fraternity, and Sigma Nu Fraternity. In 1972, Williams was elected as the president of the North Central Weed Science Society and in 1977 he was given the society's highest honor, a honorary membership in the NCWSS.

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**Adjunct Professor Emeritus of Weed Science**  
**Marvin M. Schreiber**  
**1925 - 2006**

Dr. Marvin Schreiber passed away on April 1, 2006 while recuperating from heart surgery in Atlantis, Florida. He is survived by his wife Nora and daughter, Michelle Lipidus (husband, Jeff) and two granddaughters, Gabrielle and Molly Lipidus of Hunstville, Alabama.

Born Oct. 17, 1925 in Springfield, Massachusetts. He received his B.S. in science from the University of Massachusetts, a M.S. in 1951 in science from the University of Arizona in 1951 and his Ph.D. in botany and plant pathology from Cornell University in 1954. He was a veteran, serving in the Navy from 1944 to 1946.

While at Purdue, Schreiber developed a first class research and graduate education program which was recognized nationally and internationally. He published over 100 research articles, book chapters, Station Bulletins, technical papers, and abstracts. In addition to training a large number of graduate students and post doctoral scholars, Dr. Schreiber was a guest lecturer in eight different courses in the Departments of Agronomy and Botany and Plant Pathology.



Dr. Schreiber was president of the International Weed Society from 1979-1981. He was named a Fellow of the American Society of Agronomy, Weed Science Society, and American Association for the Advancement of Science. He received the Best Paper Award from the American Society of Agricultural Engineers in 1986 and was also a member of the New York Academy of Sciences. He received a certificate of recognition from the U.S. government for his 40 years of service and a certificate of merit from the United States Department of Agriculture for sustained superior performance as research leader of the Insect and Weed Control Research Unit in West Lafayette.

Dr. Schreiber truly left an important legacy to Purdue University and to Agriculture during his very productive 35 years of service to Purdue University.

# 2005 GRANTS

**T. S. Abney**, Southern Illinois University, \$7,000, “Indiana’s North Central ‘Frogeye Leaf Spot of Soybeans’ Research.”

**T. S. Abney**, Indiana Soybean Board, \$30,000, “Phytophthora Root Rot 2005 – Identify Role of New and Predominant Races of Soybean Phytophthora With New Emphasis on Use of Soybean Varieties With and Without RPS Resistance.”

**T. S. Abney** and **A. Westphal**, Indiana Soybean Board, \$50,000, “Sudden Death Syndrome 2005 – Root infection and Foliar Response of Soybean Varieties With Emphasis on Influence of Tillage Practices, Water Regimes, Microbial Communities, and Levels of SDS Pathogen.”

**T. S. Abney**, Ohio State University, \$20,000, “Indiana-Phytophthora Sojae Losses – Part of Ohio State University’s Limiting Losses to Phytophthora Sojae in the North Central Region.”

**J. A. Banks** and **D. E. Salt**, U.S. Department of Energy, \$150,000, “Genetic and Molecular Dissection of Arsenic Hyperaccumulation in the Fern *Pteris vittata*.”

**N. C. Carpita** and **W. E. Vermerris**, National Science Foundation, \$71,445, “Identification and characterization of Cell Wall Mutants by Fourier Transform Infrared and Near-Infrared Spectroscopies.”

**N. C. Carpita**, **C. J. Staiger**, **G. S. Johal**, **M. C. McCann**, and **W. E. Vermerris**, National Science Foundation, \$1,231,019, “Identification and Characterization of Cell Wall Mutants by Fourier Transform Infrared and Near-Infrared Spectroscopies.”

**N. C. Carpita**, U.S. Department of Energy, \$120,000, “Identifying the Catalytic Components of the Maize Mixed-Linkage Beta-glucan Synthase.”

**Z. Chen**, National Science Foundation, \$5,000, “Arabidopsis 2010, Functional analysis of the WRKY Transcription Factor Gene Family from Arabidopsis.”

**Z. Chen**, National Science Foundation, \$310,000, “Functional Analysis of the WRKY Transcription Factor Gene Family from Arabidopsis.”

**R. C. Coolbaugh** and **H. L. Thacker**, Foreign Agricultural Service, \$43,670, “Norman Borlaug International Science and Technology Fellowship Program: Moroccans at Purdue University.”

**D. Egel**, US/EPA, \$15,000, “Delivery of a Weather-Based Spray Advisory Program to Illinois and Indiana.”

**D. Egel**, Mary Rice Foundation, \$10,000, “Management of Mature Watermelon Vine Decline, an Important New Disease in Indiana.”

**W. G. Johnson**, Monsanto, \$29,032, “Investigation of Corn Rootworm and Weed Species Within Stacked and Non-Stacked Corn Hybrids.”

**W. G. Johnson**, **K. D. Gibson**, **V. Davis**, and **M. Loux**, USDA CSREES NCIPM Program, \$80,858, “Glyphosate-Tolerant Weeds: Distribution, Management and Grower Education.”

**W. G. Johnson**, **A. Westphal**, **J.E. Creech**, **J. Faghihi**, and **V. R. Ferris**, Indiana Soybean Board, \$23,110, “Influence of Winter Weed Management and Cropping System of Weed Seedbank Dynamics of SCN Population Density.”

**W. G. Johnson** and **K. D. Gibson**, Cooperative State Research Service, \$45,646, “Glyphosate-Tolerant Weeds: Distribution, Management and Grower Education.”

**W. G. Johnson**, **V. M. Davis**, **K. D. Gibson**, and **R. A. Dewell**, Indiana Soybean Board, \$25,245, “Developing Effective Management Strategies for Glyphosate-Resistance Horseweed and Other Weeds.”

**W. G. Johnson** and **K. D. Gibson**, Cooperative State Research Service, \$35,202, “Glyphosate-Tolerant Weeds: Distribution, Management and Grower Education.”

**H. W. Ohm** and **S. B. Goodwin**, Agricultural Research Service, \$9,686, “Genetics of Resistance to *Septoria tritici* Blotch in Wheat.”

**R. X. Latin**, Bayer Corporation, \$4,200, “Evaluation of Bayer Fungicides for Turf Disease Control.”

**C.A. Lembi**, USDA/ARS, \$10,000, “Spatial and Temporal Variation in the Composition of Filamentous Algae Present in California Rice Fields.”

**C. A. Lembi**, Army Engineer Research and Development Center, \$2,280, “Aquatic Plant Management Research.”

# 2005 GRANTS

R. F. Turco, **C. A. Lembi**, and J. M. Harbor, U.S. Geological Survey, \$92,412, "Fiscal Year 2005 Water Resources Research Institute Annual 104 (B) Base Program."

**C. A. Lembi** and **R. E. Pruitt**, Purdue Research Foundation, \$20,000, "Rapid Detection of Toxic-Taste and Odor-Causing Cyanobacteria in Indiana Surface Waters."

**R. D. Martyn**, Michigan State University, \$54,561, "National Plant Pest and Disease Diagnostic Network (NPDN)."

**T. Mengiste**, National Science Foundation, \$160,389, "Molecular Dissection of Plant Defense Responses to Necrotropic Pathogens."

**R. E. Pruitt** and **M. A. Webb**, National Science Foundation, \$230,000, "Analysis of a Novel Mechanism of Genetic Reversion in Arabidopsis."

**G. E. Shaner**, USDA/ARS, \$94,308, "Fusarium Head Blight of Wheat: Epidemiology and Management by Genetic and Chemical Means."

**G. E. Shaner**, North Central Soybean Research Program, \$18,000, "Sentinel Plots to Monitor the Spread of Asian Soybean Rust in the U. S. Soybean Production Areas."

**G. E. Shaner**, Animal Plant Health Inspection Service, \$15,800, "Soybean Rust Early Detection Program."

**A. Westphal** and A. R. Leroy, Indiana Soybean Board, \$15,000, "Root Knot Nematode Damage in Soybean in Indiana."

D. E. Maier, **C. P. Woloshuk**, and K. E. Ileleji, Kansas State University, \$82,395, "Consortium for Integrated Management of Stored Product Insect Pests."

D.E. Maier, C. E. Alexander, **C. P. Woloshuk**, L. J. Mason, and R. Hulasare, Cooperative State Research Service, \$97,000, "Food Grains Ozonation – A New Stored Product IPM Pest Control Technology."

**C. P. Woloshuk**, Cooperative State Research Service, \$390,000, "Fumonisin Biosynthesis by *Fusarium verticillioides* in a Maize Kernel Environment."

**J. R. Xu**, Cooperative State Research Service, \$385,000, "Molecular Mechanisms Regulating the Activation of the PMK1 Map Kinase Pathway in *Magnaporthe grisea*."

**J. R. Xu**, Agricultural Research Service, \$58,005, "Use of Gene Expression Analysis to Study Pathogenicity in *Gibberella Zeae*."

**J. R. Xu**, National Science Foundation, \$9,325, "REU Supplement for 'Whole Genome Analysis of Fungal-Host Recognition and Subsequent Responses in the Blast Patho-System.'"

## Purdue Plant Scientist Appointed as 11th Department Head of Botany and Plant Pathology



Effective May 1, 2006, Dr.

**Peter Goldsbrough** took the helm as the newest department head for the Department of Botany and Plant Pathology. After a national search, Goldsbrough was selected to lead the department where he was a postdoctoral researcher 24 years earlier. For the past 20 years, Peter has been a faculty member in the Department of Horticulture and Landscape Architecture.

"I'm very honored and excited to return to the botany and plant pathology department," said Goldsbrough. "We have a wonderful faculty, and I want to maintain the department's strengths in teaching, research, and outreach in plant and weed science and plant pathology." Dean Randy Woodson said that Peter was an outstanding choice for the position.

Goldsbrough said he plans to continue both research and teaching and wants to attract more students to the department. He enjoys connecting with students and encouraging their creativity.

In his research, Goldsbrough delves into how plants react to their environment and defend themselves against damaging chemical and drought. He studies a family of enzymes involved in plants' abilities to provide protection against a variety of compounds, including herbicides.

Peter earned his B.S. degree at Edinburgh University in Scotland, and his Ph.D. at the University of East Anglia in England.

The Department of Botany and Plant Pathology is pleased to welcome Peter, his wife Jeanette, and their two children, Claire and Ian, to the botany and plant pathology family!

# 2005 PUBLICATIONS

Wang, W., M. Tanurdzic, M. Luo, N. Sisneros, H. R. Kim, J. K. Weng, D. Kudrna, C. Mueller, K. Arumuganathan, J. Carlson, C. Chapple, C. de Pamphilis, D. Mandoli, J. Tomkins, R. A. Wing and **J. A. Banks**. 2005. Construction of a bacterial artificial chromosome library from the spikemoss *Selaginella moellendorffii*: A new resource for plant comparative genomics. *BMC Plant Biology* 5:10-18.

Schmidt, A. A., **W. G. Johnson**, D. A. Mortensen, A. R. Martin, A. Dille, D. E. Peterson, C. Goza, J. J. Kells, R. D. Lins, C. M. Boerboom, C. L. Sprague, S. Z. Knezevic, F. W. Roeth, C. R. Medlin, and **T. T. Bauman**. 2005. Evaluation of corn (*Zea mays* L.) yield-loss estimations by Weed SOFT in the North Central Region. *Weed Technology* 19:1056-1064.

Chen, K., **B. Fan**, L. Du and **Z. Chen**. 2005. Activation of hypersensitive cell death by receptor-like protein kinases from *Arabidopsis*. *Plant Molecular Biology* 56:271-283.

Menke, F. L. H., H.-G. Kang, **Z. Chen**, J. Park, J. M., D. Kumar and D. F. Klessig. 2005. Transcription factor NtWRKY1 is phosphorylated by the MAP kinase SIPK and mediates HR-like cell death in tobacco. *Molecular Plant-Microbe Interaction* 18:1027-1034.

Shim, W.-B. and **L. D. Dunkle**. 2005. Malazy, a degenerate, species-specific transposable element in *Cercospora zea-maydis*. *Mycologia* 97:349-355.

**Flaherty, J. E.** and **L. D. Dunkle**. 2005. Identification and expression analysis of signal transduction genes induced during conidiation in *Exserohilum turcicum*. *Fungal Genetics and Biology* 42:471-481.

**Gibson, K. D., W. G. Johnson** and **D. E. Hillger**. 2005. Farmer perceptions of problematic corn and soybean weeds in Indiana. *Weed Technology* 19:1065-1070.

Abbasi, M., **S. B. Goodwin**, and M. Scholler. 2005. Taxonomy, phylogeny and distribution of *Puccinia graminis*, the black stem rust: New insights based on

rDNA sequence data. *Mycoscience* 46:241-247.

Doll, D. A., P. E. Sojka, and **S. G. Hallett**. 2005. Factors affecting the efficacy of spray application of the bioherbicide fungus *Microsporeopsis amaranthi*. *Weed Technology* 19:110-115.

Héraux, F. M. D., **S. G. Hallett**, and S. C. Weller. 2005. Combining *Trichoderma virens*-inoculated compost and a rye cover crop for weed control in transplanted vegetables. *Biological Control* 34:21-26.

Héraux, F. M. D., **S. G. Hallett**, and S. C. Weller. 2005. Composted chicken manure as a medium for the production and delivery of *Trichoderma virens* for weed control. *Hort Science* 40:1394-1397.

**Hallett, S. G.** 2005. Where are the bioherbicides? *Weed Science* 53:404-415.

**Creech J. E., W. G. Johnson, J. Ferris, R. R. Ferris, and A. Westphal**. 2005. First report of soybean cyst nematode reproduction of purple deadnettle under field conditions. Online. *Crop Management* doi:10.1094/Cm-2005-0715-01-BR.

Li, J., R. J. Smeda, B. A. Sellers, and **W. G. Johnson**. 2005. Influence of formulation and glyphosate salt on absorption and translocation on three annual weeds. *Weed Science* 53:153-159.

Harmon, R. F. and **R. Latin**. 2005. Winter survival of the perennial ryegrass pathogen *Magnaporthe*

*oryzae* in north central Indiana. *Plant Disease* 89:412-418.

**Latin, R.** 2005. Take all patch on creeping bentgrass greens. *Golf Course Management* 72:10:89-92.

**Egel, D. S., R. Harikrishnan** and **R. D. Martyn**. 2005. First report of *Fusarium oxysporum* f. sp. *niveum* race 2, causal agent of fusarium wilt of watermelon in Indiana. *Plant Disease* 89:108.

Christine, K. Y., K. Springob, J. Schmidt, **R. L. Nicholson**, I. K. Chu, W. K. Yip, and Clive Lo. 2005. A stilbene synthase gene (SbSTS1) is involved in host and non-host defense responses in sorghum. *Plant Physiology* 138:393-401.



Lolle, Susan J, J. L. Victor, J. M. Young, and R. E. Pruitt. 2005. Genome-wide non-mendelian inheritance of extra-genomic information in *Arabidopsis*. *Nature* 434:505-509.

# 2005 PUBLICATIONS

Boddu, J., C. Svabek, R. Sekhon, A. Gevens, **R. L. Nicholson**, A. D. Jones, J. F. Pederson, D. L. Gustine, and S. Chopra. 2005. Expression of a putative flavonoid 3' hydroxylase in sorghum mesocotyls synthesizing 3-deoxyanthocyanidins. *Physiological and Molecular Plant Pathology* 65:101-113.

**Lolle, S. J.**, J. L. Victor, **J. M. Young**, and **R. E. Pruitt**. 2005. Genome-wide non-mendelian inheritance of extra-genomic information in *Arabidopsis*. *Nature* 434:505-509.

Lehman, J. S., K. A. Hanson, and **G. E. Shaner**. 2005. Relationship among genes conferring partial resistance to leaf rust (*Puccinia triticina*) in wheat lines CI 13227 and L-574-1. *Phytopathology* 95:198-205.

Xu, X. Y., G. H. Bai, X. F. Carver, **G. E. Shaner**, and R. M. Hunger. 2005. Mapping of QTLs prolonging the latent period of *Puccinia triticina* infection in wheat. *Theoretical & Applied Genetics* 110:244-251.

Xu, X. Y., G. H. Bai, B. F. Carver, **G. E. Shaner**, and R. M. Hunger. 2005. Molecular characterization of slow leaf-rusting resistance in wheat. *Crop Science* 45:758-765.

Yang, J., G. H. Bai, and **G. E. Shaner**. 2005. Novel quantitative trait loci (QTL) for fusarium head blight resistance in wheat cultivar Chokwang. *Theoretical and Applied Genetics* 111:1571-1579.

**Cooley, C.**, **B. Bluhm, B. Reuhs**, and **C. Woloshuk**. 2005. Glass-fiber disks provide suitable medium to study polyol production and gene expression in *Eurotium rubrum*. *Mycologia* 97:743-750.

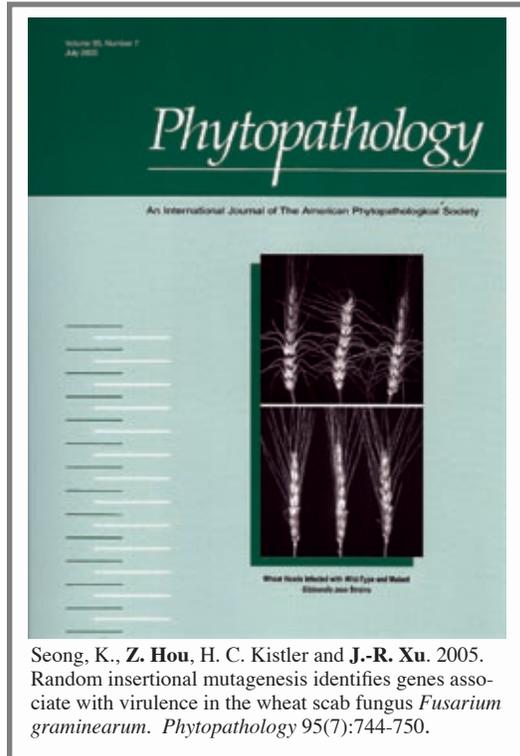
**Bluhm, B. H.**, and **C. P. Woloshuk**. 2005. Amylopectin induces fumonisin B<sub>1</sub> production by *Fusarium verticillioides* during colonization of maize kernels. *Molecular Plant Microbiology Interactions* 12:1333-1339.

Zhao, X., **Y. Kim**, G. Park, and **J. R. Xu**. 2005. A mitogen-activated protein kinase cascade regulating infection-related morphogenesis in *Magnaporthe grisea*. *The Plant Cell* 17:1317-1329.

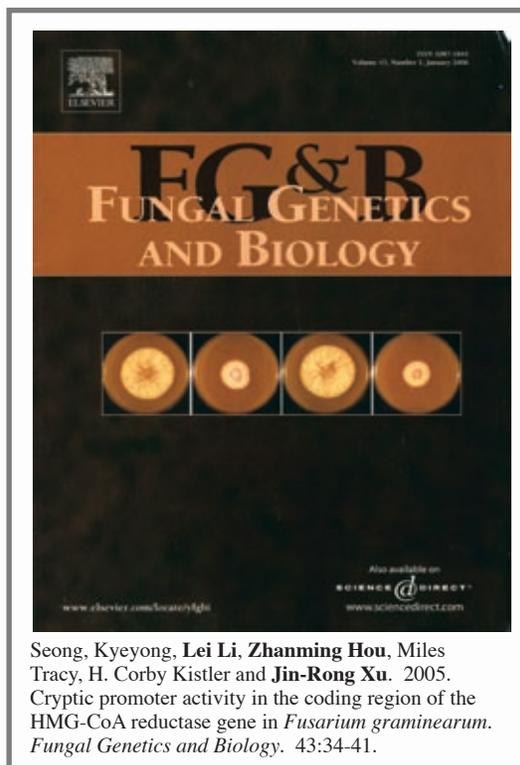
Seong, K., **Z. Hou**, M. Tracy, H. C. Kistler, and **J. R. Xu**. 2005. Random insertional mutagenesis identifies genes associated with virulence in the wheat scab fungus *Fusarium graminearum*. *Phytopathology* 95:744-750.

Dean, R., N. Talbot, D. Ebbole, M. Farman, T. Mitchell, M. Orbach, M. Thon, R. Kulkarni, **J.-R. Xu**, H. Pan, N. Read, Y. Kolomiets, C. Rehmeyer, W. Li, M. Harding, K. Kim, M. Lebrun, H. Bohnert, J. Butler, S. Calvo, L. Ma, R. Nicol, S. Purcell, C. Nusbaum, J. Galagan and B. Birren. 2005. Analysis of the genome sequence of the plant pathogenic fungus *Magnaporthe grisea*, the causal agent of rice blast disease. *Nature* 434:980-986.

Seong, Kyeyong, **Lei Li**, **Zhanming Hou**, Miles Tracy, H. Corby Kistler and **Jin-Rong Xu**. 2005. Cryptic promoter activity in the coding region of the HMG-CoA reductase gene in *Fusarium graminearum*. *Fungal Genetics and Biology*. 43:34-41.



Seong, K., **Z. Hou**, H. C. Kistler and **J.-R. Xu**. 2005. Random insertional mutagenesis identifies genes associated with virulence in the wheat scab fungus *Fusarium graminearum*. *Phytopathology* 95(7):744-750.



Seong, Kyeyong, **Lei Li**, **Zhanming Hou**, Miles Tracy, H. Corby Kistler and **Jin-Rong Xu**. 2005. Cryptic promoter activity in the coding region of the HMG-CoA reductase gene in *Fusarium graminearum*. *Fungal Genetics and Biology*. 43:34-41.

# 2005 EXTENSION PUBLICATIONS

**Harmon, P.** and **R. Latin**, BP-104-W, Turfgrass Disease Profile: Red Thread.

**Latin, R.** BP-105-W, Turfgrass Disease Profile: Dollar Spot.

**Latin, R.** BP-106-W, Turfgrass Disease Profile: Brown Patch

**Latin, R.** BP-114-W, Turfgrass Disease Profile: Take All Patch.

**Latin, R.** BP-115-W, Turfgrass Disease Profile: Summer Patch.

**Patton, A.** and **R. Latin**. BP-117-W, Turfgrass Disease Profile: Rhizoctonia Large Patch.

**Egel, D.** IP-56, Midwest Vegetable Production Guide for Commercial Growers 2005.

**Gerber, C. K., S. M. Brouder, E. P. Christmas, J. Faghihi, B. C. Joern, W. G. Johnson, J. S. Loven. G. R. Nice, R. L. Nielsen, J. L. Obermeyer, G. E. Ruhl, G. E. Shaner, G. C. Sheinhardt, and A. Westphal.** ID-179, Corn and Soybean Field Guide.

**Loux, M., J. Stachler, W. Johnson, G. Nice, V. Davis, and D. Nordby.** ID-323, Biology and Management of Horseweed.

**Shaner, G, C. Alexander, E. Christmas, S. Conley, C. Dobbins, C. Hurt, G. Patrick, K. Rane, and G. Ruhl.** ID-324, Preparing for Asian Soybean Rust.

**Lembi, C. A.** PPP-5, Category 5 Pest Control, Indiana Commercial Pesticide Applicator Training Manual.

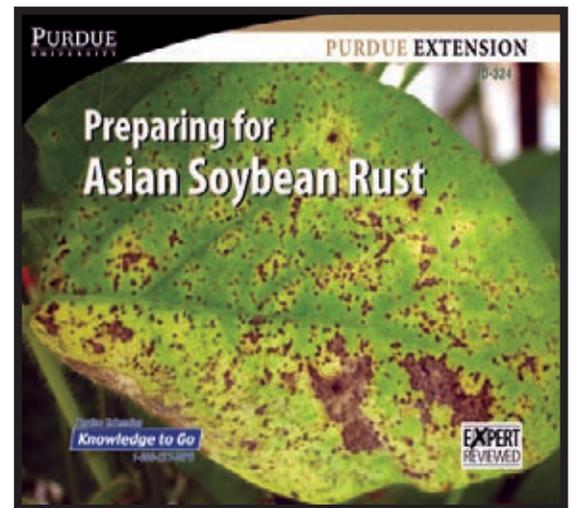
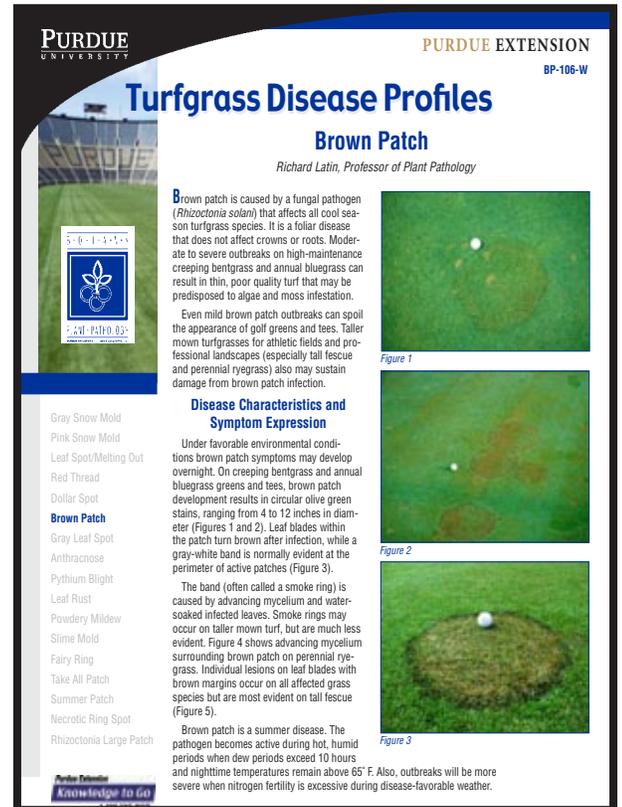
**Whitford, F., S. Salomon, M. Templeton, G. Blase, B. Miller, D. Davis, J. Massey, and A. Blessing.** PPP-65, DOT: Rules of the Road - Putting Responsible Drivers and Safe Vehicles on the Highway.

**Whitford, F., S. Salomon, M. Templeton and A. Blessing.** PPP-68, Carrying Farm Products and Supplies on Public Roads.

**Whitford, F., M. Hanna, C. Gerber, M. Wade, and A. Blessing.** PPP-69, The Hiring Process: Recruiting, Selecting, and Interviewing the Best Employees.

**Martin, A. R., L. Bills, C. Boerboom, W. G. Johnson, G. R. W. Nice, T. T. Bauman, C. Sprague, R.**

**Proost, D. Peterson, A. Dille, J. Kells, C. Guza, and B. Sellers.** WeedSOFT 2005: Weed Management Decision Support System. University of Nebraska Cooperative Extension Publication CD5.



A complete list of departmental extension publications is available at <http://www.btny.purdue.edu/Pubs/>

Many of the listed publications are in a Portable Document Format (PDF) and are available to download.

# 2005 SEMINAR SERIES

**Dr. Lijuan Xing**, Department of Botany and Plant Pathology, Purdue University. “*Sudden death syndrome of soybean.*”

**Dr. Gert Kema**, Plant Research International, Wageningen, The Netherlands. “*Fungal genetics at Plant Research international: Genes and screens.*”

**Ms. Gail Ruhl and Dr. Karen Rane**, Department of Botany and Plant Pathology, Purdue University. “*Ag Biosecurity and the Purdue Plant and Pest Diagnostic Laboratory.*”

**Ms. Lei Li**, Department of Botany and Plant Pathology, Purdue University. “*Identification of pathogenicity genes in the rice blast fungus by promoter trapping.*” (Ph.D. research seminar)

**Dr. David Rizzo**, Department of Plant Pathology, University of California, Davis. “*Sudden oak death syndrome.*”

**Dr. Ralph Quatrano**, Department of Biology, Washington University. “*The moss Physcomitrella patens: Comparative functional genomics to study gene regulation by abscisic acid and polar tip growth.*”

**Dr. Greg Browne**, USDA/ARS, University of California, Davis. “*Replant problems of deciduous fruit trees.*”

**Dr. Christy Sprague**, Department of Crop and Soil Science, Michigan State University. “*The rise of two problematic weed species in Midwestern cropping systems.*”

**Dr. Richard Belanger**, University of Laval, Quebec, Canada. “*Induced resistance in cucumber.*”

**Dr. Pat Tranel**, Department of Crop Science, University of Illinois. “*Promiscuity, herbicide resistance, and other dirty little secrets of waterhemp.*”

**Dr. Bruce McDonald**, Swiss Federal Institute of Plant Pathology, Zurich, Switzerland. “*Population genetics and evolutionary biology of plant pathogens.*”

**Dr. Cliff Weil**, Department of Agronomy, Purdue University. “*Things corn, weeds, and beer tell us about cancer and the immune system.*”

**Dr. Michael Held**, Department of Botany and Plant Pathology, Purdue University. “*Viral induced gene silencing in barley for the identification of the genes encoding the  $\beta$ -glucan synthase.*”

**Dr. Justin Farris**, USDA/ARS, Fargo, North Dakota. “*Genomic analysis of loci conferring sensitivity to the proteinaceous host-selective toxins Ptr ToxA and SnTox1 in wheat.*”

**Dr. Linda Kohn**, Department of Botany, University of Toronto. “*Impacts of domestication on population divergence and speciation in fungi.*”

**Dr. Corby Kistler**, Department of Plant Pathology, University of Minnesota. “*Genomics of Fusarium species.*”

**Dr. Richard Amasino**, Department of Biochemistry, University of Wisconsin. “*Remembering winter: Vernalization is an environmentally induced epigenetic switch.*”

**Mr. Burton Bluhm**, Department of Botany and Plant Pathology, Purdue University. “*Regulation of fumonisin biosynthesis in the maize kernel.*” (Ph.D. Research Seminar)

**Mr. Luke Gumaelius**, Department of Botany and Plant Pathology, Purdue University. “*Characterizing the molecular basis of arsenic tolerance and hyperaccumulation in the fern Pteris vittata.*” (Ph.D. Research Seminar)

**Dr. Xinnian Dong**, Department of Biology, Duke University. “*Systemic acquired resistance.*”

**Dr. Charles An**, Department of Horticulture, University of Wisconsin. “*Conserved and divergent transcriptional control of seed germination.*”

**Mr. Dave Hillger**, Department of Botany and Plant Pathology, Purdue University. “*Tomatoes: The other red meat - Characterizing the weed management and communities of Indiana’s tomato production.*” (Ph.D. Research Seminar)

**Mr. Chad Dyer**, Department of Botany and Plant Pathology, Purdue University. “*Weed control, crop response, and soil persistence of KIH-485.*” (M.S. Research Seminar)

**Mr. Eric Ott**, Department of Botany and Plant Pathology, Purdue University. “*Biology and management of giant ragweed.*” (M.S. Research Seminar)

**Dr. Zhixiang Chen**, Department of Botany and Plant Pathology, Purdue University. “*Plant genes involved in plant-virus interactions and RNA silencing.*”

# POST-DOCTORAL RESEARCHERS & VISITING SCIENTISTS



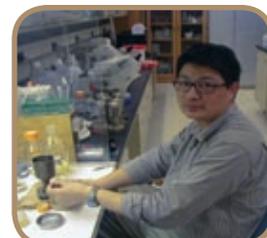
**Dr. Burton Bluhm**  
Ph.D. Purdue University  
Post-Doc in Dunkle Lab



**Dr. Satya Chintamanani**  
Ph.D. Kent State University  
Post-Doc in Johal Lab



**Dr. Xiaofeng Cui**  
Ph.D. Zhejiang University, China  
Post-Doc in Chen Lab



**Dr. Shengli Ding**  
Ph. D. China Agricultural University  
Post-Doc in Xu Lab



**Dr. Danielle Ellis**  
Ph.D. University of Arizona  
Post-Doc in Banks Lab



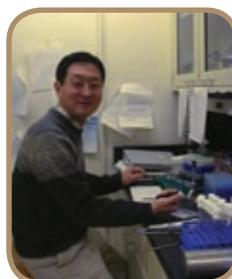
**Dr. Daniel Gwary**  
Ph.D. University of Wales, Bangor  
Visiting Scientist in Nicholson's Lab



**Dr. Michael Held**  
Ph.D. Ohio University  
Post-Doc in Carpita Lab



**Dr. Aftab Khan**  
Ph.D. Cornell University  
Post-Doc in Carpita Lab



**Dr. Kang-Chang Kim**  
Ph.D. Sogang University, Korea  
Post-Doc in Chen Lab



**Dr. Hongli Luo**  
Ph.D. Zhejiang University, China  
Post-Doc in Mengiste Lab



**Dr. Radnaa Naron**  
Ph.D. Slovak Academy of Science  
Post-Doc in Carpita Lab



**Dr. Bryan Penning**  
Ph.D. University of Missouri  
Post-Doc in Carpita Lab



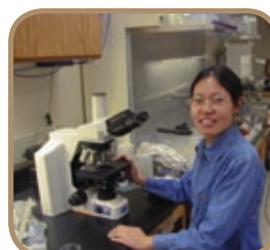
**Dr. Yasser Shabana**  
Ph.D. Mansoura University, Egypt/  
University of Florida  
Visiting Scientist in Hallett Lab



**Dr. Gui Shen**  
Ph.D. Nanjing Agricultural University  
Post-Doc in Xu Lab



**Dr. Fengming Song**  
Ph.D. Zhejiang University, China  
Post-Doc in Mengiste Lab



**Dr. Lijuan Xing**  
Ph.D. Shenyang Ag. University, China  
Post Doc in Westphal Lab



**Dr. Julie Zwiesler-Vollick**  
Ph.D. Michigan State University  
Visiting Scientist in Goodwin Lab

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# INTERNATIONAL HIGHLIGHTS

**Dr. Greg Shaner** and Dr. Shawn Conley spent 2 weeks during mid February 2005 in Brazil, looking at soybean rust. They traveled from Sao Paulo to Minaus, visiting many farms along the way. Through direct observation and discussions with farmers and plant pathologists, they were able to learn a lot about field and lab diagnosis of the disease and its management with fungicides.

In a sort of international activity in reverse, Dr. Tadashi Yorinori, a soybean pathologist from Brazil (who accompanied this group in Brazil), came to Indiana in the summer and gave presentations to farmers at four of Purdue's research farms (ACRE, DPAC, SEPAC, SWPAC).

In 2005, **Dr. Don Huber** participated in international symposia and cooperative research in several countries. Huber was an invited speaker at an international symposium in Brazil. He spoke on the role of nutrition in disease, and also reviewed the cooperative research with T. Yamada (Brazil), Volker Romheld (Germany), D. Huber (U.S.) on control of citrus variegated chlorosis (one of the select agent diseases of concern) and soybean rust. Huber was an invited speaker at the 13th Latin American Phytopathology Congress in Cordoba, Argentina and he was an invited speaker at the Sugar Cane Research Conference in Tucuman, Argentina. While in Tucuman, Huber did an in-depth evaluation of research programs and made recommendations to control "sugarcane decline" and other debilitating diseases of this crop. Dr. Huber then traveled to Russia, where he evaluated WMD non-proliferation activities with biological agents in Russia and designed facilities to facilitate treaty compliance and promote cooperation. He also was an invited speaker at the International Sulfur Workshop at Braunschweig, Germany. Huber travels then took him to England. At Rothamstead, he spoke about take-all and causes for the reemergence of this debilitating disease of cereals. In York, Huber was a speaker and research reviewer of nutrition-disease interactions and micronutrient research cooperator.

Purdue University worked with the USDA Foreign Agricultural Service with funds from the State Department's Middle East Partnership Initiative (MEPI) to provide training in the most modern plant and animal diseases diagnostic methods. **Dr. Ron Coolbaugh** served as the Coordinator of the project. The Department of Botany and Plant Pathology hosted three Moroccan plant disease diagnosticians for a 5 week workshop in early 2005. The workshop was planned with the assistance of **Gail Ruhl** and **Dr. Karen Rane**, Co-Directors of our Plant and Pest Diagnostic Laboratory. The Moroccans were treated to orientations to many of the extension and research programs in Agriculture at Purdue, including the PDDL, the National Plant Disease Network, IPM, and Purdue Pesticide Programs. Much of their time was spent learning

molecular methods for identifying plant pathogens in the laboratories of Dr. Joe Anderson, **Dr. Steve Goodwin**, and **Dr. Sue Loesch-Fries**. It is noteworthy that Joe Anderson and Steve Goodwin are both USDA-ARS scientists and Adjunct Professors at Purdue. The primary goal was to help them to learn the theory and practice of real time PCR and real time RT-PCR, as this method is being applied to the final diagnosis of a number of plant diseases across the U.S. With the assistance of Dr. Karen Rane, the Moroccan guests had an opportunity to use the Smart Cycler II, which is the instrument used by all of the diagnostic labs at APHIS and throughout the network of Land Grant Universities. The Borlaug Fellows also had opportunities to visit the Danforth Center for Plant Science Research in St. Louis, Missouri, the Plant Disease Diagnostic Laboratory at the University of Kentucky in Lexington, the plant disease diagnostic kit producing company, Agdia, in Elkhart, Indiana, and the APHIS plant disease diagnostic laboratories in Beltsville, Maryland. When the Moroccans returned home, the USDA-MEPI project delivered three Smart Cycler II instruments along with accessory equipment and supplies to establish this technology in each of the three laboratories. Joe Anderson went to Morocco in June, 2005 to help install the new equipment and assist them with the startup procedures. All three of the faculty mentors (Drs. Anderson, Goodwin, and Loesch-Fries) and Dr. Coolbaugh went to Morocco in May, 2006 to learn about Moroccan agriculture practices, assess the status of their diagnostic work being done by the Borlaug Fellows, and assist with training of additional personnel who may be able to expand the use of this method to varietal identification and other important uses. One day of the trip to Morocco was scheduled for a series of presentations by the Purdue faculty on the uses of real time PCR and other techniques for plant disease diagnosis, mechanisms for developing disease resistance, and the National Plant Diagnostic Network. About 30 scientists from across Morocco, representing both government and private industry, were in attendance. In September, 2005 Coolbaugh hosted a second group of Borlaug International Fellows from Morocco. This 5-week workshop was similar to the first, but it was a group of veterinarians who work for the Ministry of Agriculture and are involved in animal disease diagnosis and epidemiology. In cooperation with Dr. Leon Thacker, Director of the Indiana Animal Disease Diagnostic Lab, Coolbaugh coordinated the program with staff from the ADDL and the School of Veterinary Medicine. The ADDL faculty mentors included Drs. Ching Ching Wu, Jose Ramos-Vara, and Ramesh Vemulapalli. In addition to lecture and laboratory experiences custom designed for this group of Fellows, they visited the National Animal Disease Laboratories in Ames, Iowa and the Foreign Animal Disease Control Labora-

# INTERNATIONAL HIGHLIGHTS

tories on Plum Island, New York. One of the Fellows was invited back in March, 2006 for a special workshop on diagnosis of Avian Influenza at the NADL in Ames, IA.

The U.S. National Science Foundation funded a collaboration between scientists in Brazil (Dr. Marcos Buckridge, University of São Paulo, and Dr. Eugênio Ulian, Sugarcane Technology Center (Centro de Tecnologia Canavieira), and Purdue University (Dr. Nick Carpita and Dr. Wilfred Vermerris), with the additional expertise and technical support of Dr. Mark Davis, National Renewable Energy Lab, Golden, Colorado. The team will mine maize and sugarcane genetic resources to uncover determinants of carbohydrate production, lignin production, and carbohydrate-lignin interactions that potentially impact saccharification potential for biofuel production. The knowledge base would consequently impact improvements in nutrient availability in forage grasses for ruminant animals. In Brazil, recombinant inbred lines of sugarcane have been developed and quantitative trait loci have been identified that correspond to high carbohydrate/low-lignin phenotypes. They will use this collection as a training set to establish NIR spectrotypes associated with altered carbohydrate-lignin composition.

In June 2005, **Dr. Jin-Rong Xu** visited the research group lead by Dr. Marc-Henri Lebrun at Bayer Crop-Science in Lyon, France. Dr. Xu gave a seminar entitled "Infection-related morphogenesis in *Magnaporthe grisea*." The following month Dr. Xu attended a panel meeting at the National Science Foundation-China (NSF-C) in Beijing, China. He received funding from NSF-C for a three-year project on functional characterization of G-protein coupled receptors in the rice blast fungus. A formal collaboration was established between Dr. Xu and Dr. Zonghua Wang at Fujiang Agriculture and Forestry University during this visit. In August 2005, Jin-Rong Xu was invited to chair a symposium for the Third Chinese Rice Blast Conference. He also was one of the keynote speakers at this conference. In addition, Dr. Xu visited Dr. Youliang Peng's lab at China Agricultural University and Dr. Fucheng Lin's lab at Zhejiang University.

**Dr. Ray Martyn** attended the 3rd International Cucurbitaceae Conference in Townsville, Australia in September 2005 sponsored by the International Society of Horticultural Sciences. This conference is held every four years and was attended by over 200 cucurbit scientists (breeders, pathologists, physiologists, etc). Dr. Martyn presented a keynote lecture entitled "Late-season vine declines of melons: Pathological, cultural, or both". He also chaired two scientific sessions and was a member of the conference scientific program board. The 4th International Conference will be held in Beijing, China

in 2009.

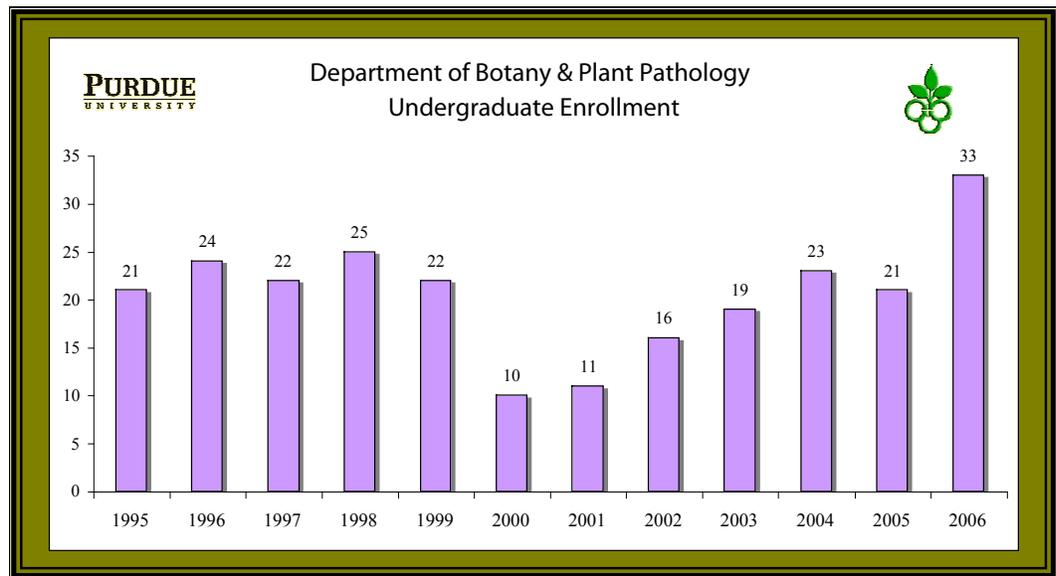
**Dr. Charles Woloshuk** was a speaker and participant at the Cape to Cairo Safari Conference in September 2005 at North-West University in Potchefstroom, South Africa. The conference was held as an initiative for developing a research program to study the indigenous plants that traditionally have been consumed by rural Africans. With the increased pressure to grow western crops and the impact of HIV/AIDS on the family structure, there is fear that the knowledge on these plants will be lost. This would include knowing the plants, seed collection and storage, cultivation, and preparation. The conference participants were from many African countries, including Egypt, Morocco, Cameroon, Nigeria, and South Africa. Expertise included plant pathologists, nutritionists, medical pathologist, and physiologists. After a day of talks, they worked on the strategic plan for the group, which they have named themselves IDIFA (Initiative for the Development of Indigenous Food-Plants of Africa). Charles was one of four non-African scientists that were invited to participant. They served as group leaders during the strategic plan discussions. The discovery of fumonisins and the important health issues associated with this mycotoxin originated in South Africa. They have found fumonisins and the fungus that produces them in several of these indigenous plants. Woloshuk continues to interact with the group at North-West University and IDIFA.

**Dr. Guri Johal** attended two international meetings in 2005. The first was a joint event that brought together two different symposia in one meeting - the 5th International Rice Genetics Symposium and the 3rd International Rice Functional Genomics Symposium. This meeting was held at the EDSA Shangri-la Hotel, in Manila, Philippines in mid-November 2005. Dr. Johal chaired the session on "Heterosis and rice breeding." The second meeting was in India and was held at Udaipur (Rajasthan) in late November 2005. The Global Conference II, it is organized by the Indian Society of Mycology and Plant Pathology in conjunction with M.P. University of Agriculture & Technology. Dr. Johal was invited to deliver a lead lecture in the session "Disease management: Novel approaches." The title of his talk is "Thinking the unthinkable: Building plants resistant to all diseases."

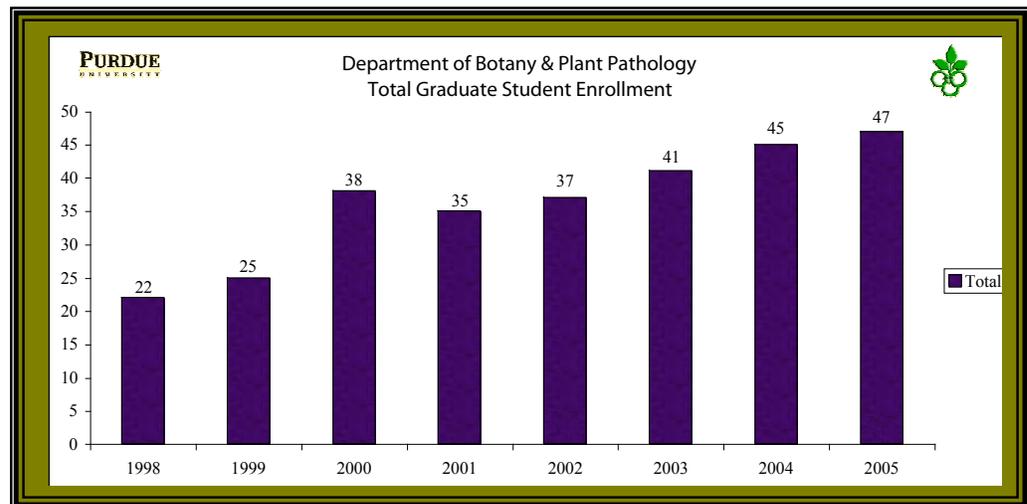
**Dr. Mary Alice Webb** was an invited speaker at the 9th International Symposium on Biomineralization held in Pucon, Chile in December 2005.

# DEPARTMENTAL PROGRESS

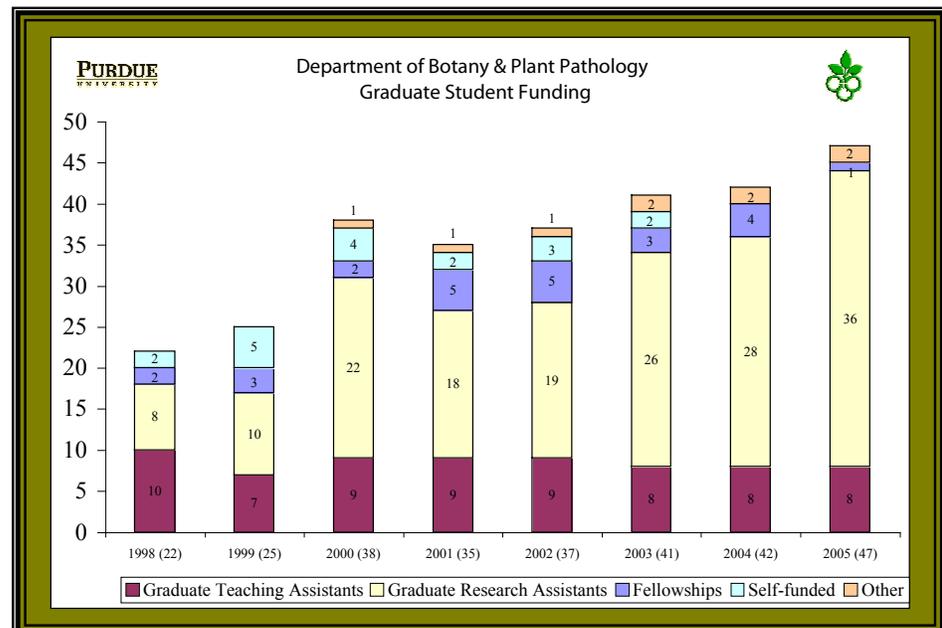
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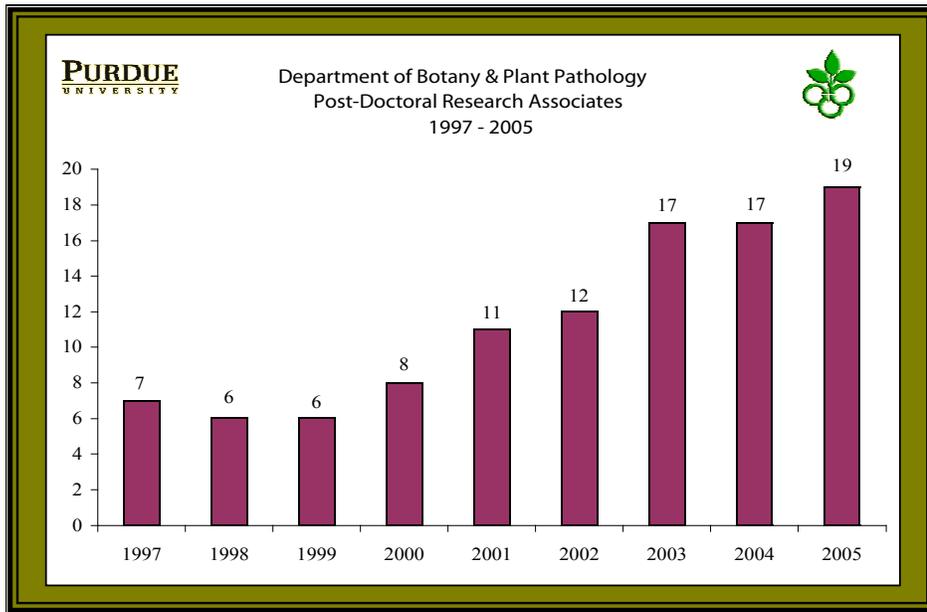
**Undergraduate Student Enrollment**



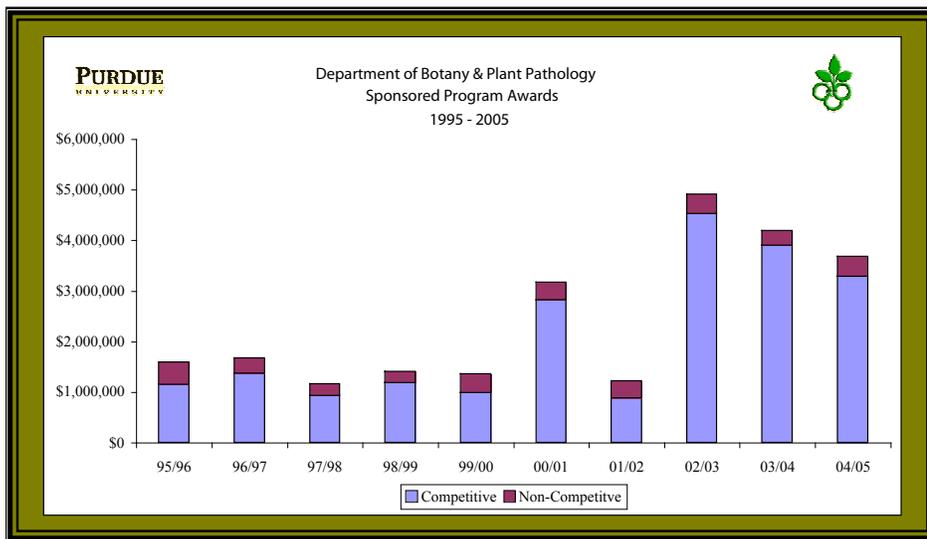
**Graduate Student Enrollment**



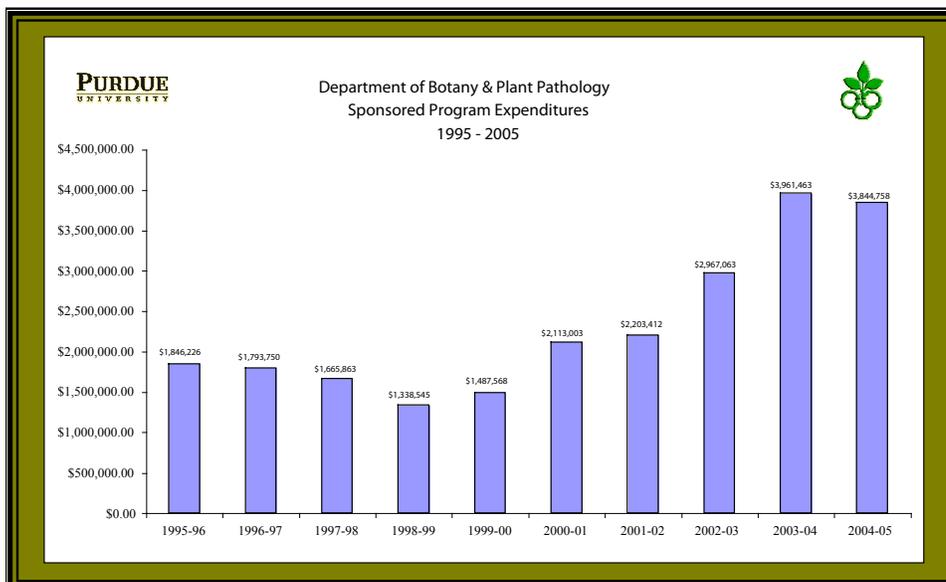
**Graduate Student Funding Sources**



**Post-Doctoral Research Associates**



**Sponsored Programs Awards (Grants)**



**Sponsored Program (Grants) Expenditures**

# ALUMNI HIGHLIGHTS

## Mason Honored as a 2005 Distinguished Agricultural Alumni Recipient

Dr. April Mason joins an elite group of individuals who have been honored by the College of Agriculture in recognition of their outstanding accomplishments and significant contributions to their profession and to society.

Dr. Mason is currently the Dean of Colorado State University's College of Applied Human Sciences. She accepted that position in August of 2004 after being at Purdue for 27 years as a student and faculty member.

Throughout her distinguished career at Purdue University, Dr. Mason's accomplishments have reflected teamwork and a commitment to excellence. Countless Hoosiers, as well as their neighbors nationwide, have benefited from the food safety and nutrition programs developed by this skilled presenter and author. Her influence knows no boundaries. For example, Dr. Mason was invited as a consulting visiting scholar to work in Bogor, Indonesia, at the Agricultural University of Bogor, where she assisted in the development of nutrition education programs for use in an Extension-type health promotion network.

In April Mason's world of work, the job is never done. A visionary thinker, she's currently focusing her research on the area of availability of key nutrients from plant-based food products, such as soybeans. These types of commodities provide critical calories and essential nutrients, and determining what factors inhibit or promote that availability is key in efforts to feed the world's growing populations.

For 27 years, Purdue University was the direct beneficiary of Mason's knowledge, energy, and talents. But the programs she launched here continue to thrive, and her influence is still profoundly felt.



Purdue President, Dr. Martin Jischke presents Dr. April Mason with the 2005 DAA Award.

*"Remember the individuals you learn with, because each one leaves you with a gift. I've spent my career in higher education in order to pass those gifts along and, hopefully, to change things for the better."*

*Dr. April Mason  
2005*



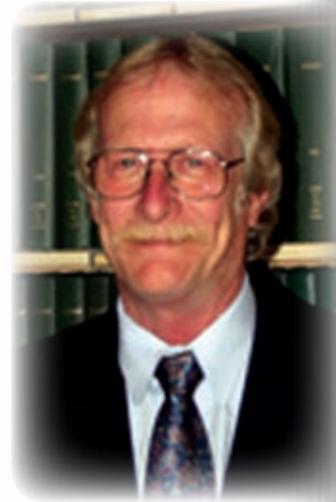
2005 Distinguished Agricultural Alumni Recipients: Front Row (L to R): M. Legan, J. Luckman, **A. Mason**, and G. Powell. Back Row (L to R): T. Beckman, S. Beck, J. K. Zhu, and W. Townsend.



Dr. April Mason poses for a picture with her father (L) and Dr. Ray Martyn (R) at an afternoon reception in her honor.

## Wolpert Honored by the American Phytopathological Society with the Noel Keen Award for Research Excellence in Molecular Plant Pathology

**Thomas J. Wolpert** was born and raised in eastern Nebraska. He received his B.S. degree in psychology with a minor in zoology from the University of Nebraska in 1973. After graduation, he worked in a number of jobs culminating in a position as a research technician in the laboratory of Dr. Larry Dunkle. Due to Dr. Dunkle's tutelage, his interest in plant pathology was initiated, cultivated, and encouraged, resulting in his attending graduate school at Purdue University. He received his M.S. in Plant Physiology in 1979 and his Ph.D. in Plant Pathology in 1983. In that same year, he began a postdoctoral position in the laboratory of Dr. Vladimir Macko, an exceptional natural products chemist at the Boyce Thompson Institute, and worked on the structural characterization of the host selective toxin, victorin. At the end of 1989, he joined the Department of Botany and Plant Pathology at Oregon State University where he currently holds the rank of professor. His initial work with victorin coincided with the work of Dr. Noel Keen on the same pathosystem, resulting in numerous interactions. This experience led to a personal appreciation of the enormous scope and quality of Dr. Keen's scientific contributions and Dr. Keen's unique ability to simultaneously challenge, encourage, and collaborate in the pursuit of scientific excellence.



The Noel T. Keen Award recognizes individuals who have made outstanding contributions in host-pathogen interactions, plant pathogens or plant associated microbes, or molecular biology of disease development or defense mechanisms. Dr. Wolpert was honored with this award at the 2005 Annual APS Meeting in August, which was held in Austin, Texas. Wolpert received this recognition due to his outstanding contributions toward understanding the structure/function of the host-selective toxin, victorin. Dr. Wolpert has enormous enthusiasm for science and a tenacity that has proven essential in his search for new approaches and techniques in the face of very difficult problems that have surfaced during studies of this disease. His research has resulted in key contributions and seminal papers characterizing this host-pathogen interaction, and has garnered Dr. Wolpert and his colleagues national and international recognition in the area of molecular plant pathology.

Beyond Dr. Wolpert's studies of the molecular interactions that occur in Victoria blight of oats, he has published on studies involving toxins produced by *Periconia circinata*, *Cephalosporium gramineum*, and *Pyrenophora tritici-repentis*. His knowledge of fungal toxins is shared in close, professional interactions with numerous colleagues, and his work has been continuously supported by grants from the USDA/NRICGP and the NSF. Additionally, at Oregon State University, Dr. Wolpert teaches an undergraduate plant physiology course and a graduate course in plant microbe interactions. He is highly regarded as an advisor and mentor of graduate students.

### Distinguished Agricultural Alumni Department of Botany and Plant Pathology

- 1992 - Dr. Paul Sun, Ph.D. 1961
- 1993 - Dr. Sue Ann Tolin, B.S. 1960
- 1993 - Dr. Leland House, B.S. 1951, M.S. 1952, Ph.D. 1956
- 1994 - Dr. Larry Vanderhoef, Ph.D. 1969
- 1997 - Dr. Gabriel Cadena - Gomez, Ph.D. 1968
- 2001 - Dr. Henry L. Shands, M.S. 1961, Ph.D. 1963
- 2002 - Dr. Naim M. Iraki, Ph.D. 1987
- 2005 - Dr. April Mason, M.S. 1980

# ALUMNI HIGHLIGHTS

## Flaherty and Wilkinson-Flaherty Accept Faculty Positions With Coker College

**Joe Flaherty** received his Ph.D. in 2003 under the direction of Dr. Charles Woloshuk. He continued on at Purdue as a USDA post-doc researcher in the laboratory of Dr. Larry Dunkle from 2004 until 2005. Joe accepted an offer from Coker College in South Carolina as an assistant professor of biology in the Department of Science and Mathematics. He is teaching courses in molecular genetics, biology, and general genetics and maintains a modest research program on molecular genetics of fungal pathogens.



**Kathryn Wilkinson** received her Ph.D. in the summer of 2005 under the direction of Dr. Carole Lembi. As Katie was finishing up her thesis, her mother and cousin were planning her wedding to Joe Flaherty. Katie deposited her thesis and headed north to Michigan, in late July, to wed Flaherty. After the wedding they loaded the moving truck, said their goodbyes to the department, and headed to South Carolina. Katie has accepted a position as an adjunct assistant professor, also in the Department of Science and Mathematics at Coker College.



## Doll Places Third in APS Pacific Division Student Paper Competition in Portland, Oregon

**David Doll** (B.S. '04) was one of three winners of the student paper presentation competition at the APS Pacific Division meeting in late June 2005. David placed third for his presentation "Investigating Possible Roles of Soilborne Bacteria in Replant Disease of Stone Fruits in California." Each of the winners received a check and an engraved plaque. At these meetings David was also presented with the Storkan-Hanes-McCaslin Fellowship. This \$5,000 award is presented by the APS Foundation to an outstanding graduate student doing research in soil-borne diseases of plants.



Student paper competition winners. (L to R) **David Doll**, 3rd place, Elsa Petit, 1st place, and Jose Ramon Urbez Torres, 2nd place. All three students attend U.C. Davis.

In addition to the awards above, David has also received two additional fellowships this past summer. The Department of Plant Pathology at U.C. Davis awards a memorial scholarship named for Professor Joe Ogawa. David received this \$1,000 fellowship. He also received \$2,000 from the Jastro-Shields Foundation. This fellowship is awarded by the University of California, Davis. David says "Life has been good. I have been working my tail off, but that is expected and now that I have received these awards, I have to make progress in my research, but I can manage that.... I think!"

## Sieglin Accepts Position at Montana State University

**Steve Sieglin** began his new responsibilities at Montana State University in February 2005. Steve serves as the MSU Extension Western Region Department Head and is responsible for one-third of the county and reservation based MSE Extension faculty. Steve is enjoying utilizing the education he gained in the Department of Botany and Plant Pathology here at Purdue. Steve earned his M.S. in 1995 under the direction of Dr. Merrill Ross. Steve also serves as the Extension representative on Montana's Noxious Weed Trust Fund, an organization that provides several hundred thousand dollars in funding each year for education, research, and control of noxious weeds in Montana.

Steve, his wife Laura, and their four children are enjoying exploring the vast natural resources of the northern Rocky Mountains, where they are frequent visitors to the Glacier and Yellowstone National Parks. The children have enjoyed seeing the wildlife (elk, bighorn sheep, black bear, mountain goats, moose, etc.). So far only the grizzly bear and the mountain lion have eluded them.

## Clive Lo Joins the Faculty at the University of Hong Kong

In November 2005, **Dr. Clive Lo** accepted an offer as an assistant professor in the Department of Botany at the University of Hong Kong.

Lo is conducting research in plant secondary metabolism and metabolic engineering, biochemistry, and molecular biology of plant-pathogen interactions and Arabidopsis molecular biology and functional genomics. He has four students, a visiting scientist, and a researcher assisting him in his laboratory.

Lo also has a heavy teaching load at the university. He will be teaching the following courses: Introduction to Biochemistry, Plant Physiology, Introduction to Molecular Biology, Economic Botany, Genetics II, Intermediate Botany Project, and Botany Project.

Clive Lo was a student in the laboratory of Dr. Ralph Nicholson and received his Ph.D. in 1999.



## Post-Doc Accepts Faculty Position at North Carolina State University

Dr. Paola Veronese accepted a faculty position at North Carolina State University in July 2005. Prior to joining NCSU, Veronese conducted post-doctoral research here at Purdue in the laboratories of Dr. Tesfaye Mengiste and Dr. Ray Bressan. Her research focused on the functional genomics of plant defense responses to phytopathogenic fungi and the analysis of the interaction and cross talk between signal transduction pathways in response to biotic and abiotic stresses. She studied pathosystems involving the model plant *Arabidopsis thaliana* and the fungi *Verticillium dahliae* and *Botrytis cinerea*.

At NCSU, Paola joined the university initiative on metabolomics and proteomics research. She will continue to study the *Arabidopsis thaliana* - *Verticillium dahliae* interaction to uncover novel regulatory mechanisms in plant stress biology in the Department of Plant Pathology at NCSU.



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# ALUMNI HIGHLIGHTS

## Stranded Rowers Rescued After 16 Hours in the Atlantic

On January 15, 2006, **Sarah Kessans** (B.S. '05) and Emily Kohl were halfway to their goal of finishing the 2,900 mile Woodvale Challenge Atlantic Rowing Race. It was the lowest point of the entire race for the teammates, emotionally. Conditions had become unrowable because of the wind and the waves. The two had been riding a sea anchor for about 18 hours. They were frustrated waiting on the conditions to improve. It was uncomfortable, hot, and cramped for both rowers to be locked in the cabin for such a long stretch of time. Sarah and Emily also came to the realization during those 18 hours that their goal of breaking the women's trans-Atlantic rowing record of 60 days was gone. But that wasn't the only issue the two faced. Their rudder line had become detached and would be useless until they could reattach it, which would have to wait until the conditions calmed considerably. Kessans and Kohl decided they would like to know how the rest of the fleet was doing, so they called the main support yacht, Aurora, at 2:30 pm. Instead of the usual chipper voice on the other end, they got an edgy voice telling them they were busy and to call back in a few hours. The two later found out they were rescuing a team from New Zealand from their life raft about 300 miles from them. The storm, was indeed, a very serious one.



Teammates Sarah Kessan (L) and Emily Kohl (R) pose for a picture by their boat, American Fire, in La Gomera, one of the Canary Islands in November 2005.

After being in the stuffy cabin, together, for many hours, the two decided to replenish the oxygen supply. They took two of the three vent covers off to let some air circulate. No sooner had they removed the vent covers than the boat was hit by a 12-foot-high rogue wave. In a matter of seconds, the two were upside down in their cabin. The boat is designed to right itself. But instead, water flowed through the open vents like wide-open bathtub faucets. The two only had about three minutes to prepare for their exit from the cabin. Sarah grabbed the VHF radio and the EPIRB (Emergency Position Indicating Radio Beacon) and Emily grabbed a sleeping bag, life jacket and digital camera. Everything else seemed to be gone. As soon as the cabin filled with water and the pressure equalized, they could open the door and escape. They two realize their situations was one of an extreme emergency. The life raft had floated away, so their only option was to climb on top of the inverted hull. Sarah activated the distress signal on the EPIRB as they clung to the overturned boat. For two years Sarah and Emily had dreamed of getting to the starting line of the race, but now that seemed like so long ago.

The water and air temperature were both around 60 degrees, but the air felt much colder, due to the high winds. Emily was wearing the only life jacket and Sarah draped the sleeping bag over her back to keep the wind off. The water felt warm until a body part would get soaked and then exposed to the wind. It took the two a couple of hours, but they figured out how to lie down across the keel to conserve energy and warmth, as they waited to be rescued.



Sarah Kessans (L) and Emily Kohl (R) in one of their final training sessions in the Canary Islands.

The pair sang any and every song that popped into their heads. They even made up songs. Kessans said, "The power of music is incredible. It is what fueled our souls during those nights when it seemed we were being watched only by the billions of stars we used to chart our course." They also picked barnacles off the hull and joked that there was no free ride for the barnacles anymore and tossed them back into the ocean.

The two are excellent teammates. Whenever one of them saw the other getting down, they knew how to raise their spirits again. The two never mentioned anything negative during their ordeal. The thoughts

# ALUMNI HIGHLIGHTS

of never seeing their families or dry land again ran through their minds, but they kept those thoughts to themselves. Maintaining a positive attitude was the only thing they could control in their situation. This attitude is what helped them survive.

After 16 hours, the two saw lights. When they realized that it was a ship and not just a rising star, they were ecstatic. While watching the lights of the ship come closer, Sarah and Emily decided to lie down to get warm. When Emily got up again to check the ship's progress, the lights had disappeared and, for the moment, so

did their hope. The two scanned the horizon and noticed lights on the opposite horizon, which turned out to be a U.S. Coast Guard search and rescue plane. The plane circled a few times and came over the two and dropped an orange flare. That was the point when the two knew they were going to be rescued. The plane radioed the location of the overturned boat to the ship the two had spotted earlier, the Stavros Niarchos. The ship responded by turning on all of its lights. It was lit up like a Christmas tree and the Sarah and Emily were like two children on Christmas morning.

After about 30 minutes the ship came into view. From a distance, it looked like the two were being rescued by a giant pirate ship. Although they were a little wary of who their rescuers were, they were about to be picked up and their spirits soared. Once aboard the Stavros Niarchos, the two were safe, warm and dry. They spent just under two weeks crossing the second half of the ocean and learning about sailing a tall ship. They reached Bequia, a little island in the Grenadines on January 22. The two enjoyed the beaches and pubs in Mayreau, Tobago Cays and St. Lucia before heading to Barbados and then Antigua.

When the two arrived in Antigua, they were met by reporters from the television show, *Inside Edition*. That was just the beginning of the media demands. The two have been kept busy since their rescue. Everyone wants to hear about their adventure.

Sarah will begin her graduate studies at Arizona State University and will be the rowing coach in the fall of 2006. Emily is at Michigan State where she also is the rowing coach.

Sarah and Emily have no intentions of retiring from rowing. In fact, the two plan to finish and break the women's record in the next race in 2009 when they will cross the Indian Ocean.

A more detailed account of the race and rescue is available at the following web site:

[www.agriculture.purdue.edu/connections](http://www.agriculture.purdue.edu/connections)



Kessans said, "Our world, once as big as our dream, had been reduced to a surface the size of a surfboard. All we could do was wait and hope." After 16 hours afloat, Sarah and Emily wait as the rescue raft from the ship, Stavros Niarchos, nears them.



Emily Kohl (L) and Sarah Kessans (R) learn to sail a tall ship while aboard the Stavros Niarchos, the ship that rescued the rowers.

# P&PDL HIGHLIGHTS

**Gail Ruhl and Dr. Karen Rane**  
**Co-Directors and Senior Plant Disease Diagnosticians**

It is hard to believe that fifteen years have come and gone since funding from the Crossroads initiative was used in 1990 to integrate the existing diagnostic and identification services offered by the Departments of Botany & Plant Pathology, Entomology, Horticulture and Landscape Architecture, Agronomy and Forestry, to create the interdisciplinary Plant and Pest Diagnostic Laboratory (P&PDL) at Purdue University. Although many things have changed over time, our mission remains the same - to provide accurate and rapid identification of plants, pests, and plant problems and serve as a source of unbiased plant and pest-related information. We continue to provide diagnostic expertise to specialists and county extension educators of the Purdue University Cooperative Extension Service (CES) and the University's research faculty and staff; to the Director of the Entomology and Plant Pathology Division of the Indiana Department of Natural Resources (IDNR) and associated nursery inspectors; and to private businesses, citizens of Indiana and other clientele across the continental United States. In 2005, a total of 2527 samples were diagnosed by the Plant and Pest Diagnostic Lab (Figs 1-3).

## HOMELAND SECURITY AND THE NATIONAL PLANT DIAGNOSTIC NETWORK

In the 2003 issue of *The Meristem*, we introduced the National Plant Diagnostic Network (NPDN), an organization of land-grant university and state regulatory diagnostic laboratories funded by USDA/CSREES to prepare for potential acts of bio-terrorism directed at U.S. food and agricultural systems following the terrorist attacks on the World Trade Centers and the Pentagon. We have completed our third year as part of the North Central Plant Diagnostic Network (directed from Michigan State University by Purdue Botany and Plant Pathology alumnus Dr. Ray Hammerschmidt), and are utilizing our improved lab infrastructure and networking capabilities to be better prepared for the diagnosis and identification of plant disease and pest introductions that have the potential to pose a threat to American agriculture.

Much of our efforts in 2005 focused on Asian Soybean Rust, an exotic fungal disease that can cause severe losses to soybean production. Following the discovery of the disease in the southern United States in November 2004, Gail Ruhl conducted diagnostic training for approximately 1400 soybean rust first detectors, comprising owners of at least 3.1 million of the approximately 5 million acres farmed in Indiana. Gail and Karen Rane (with the assistance of Amy Deitrich, Extension Secretary/webmaster) developed a Soybean Rust Website for Indiana clientele to keep them abreast of the latest in soybean rust information. The site ([www.ppdl.purdue.edu/ppdl/soybean\\_rust.html](http://www.ppdl.purdue.edu/ppdl/soybean_rust.html)) includes information specific for Indiana growers, links to key websites, and a pictorial guide for soybean rust identification.

As part of NPDN efforts to monitor for soybean rust, the Purdue Plant and Pest Diagnostic Laboratory was chosen as one of three laboratories in the North Central Region to offer real-time PCR analysis to detect the pathogen. Karen participated in two training sessions conducted at the USDA-APHIS facilities in Beltsville and

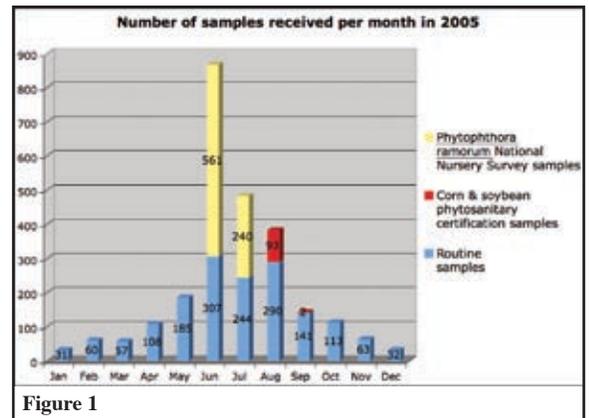


Figure 1

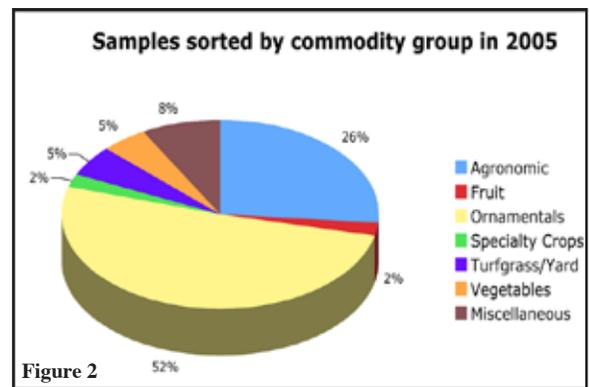


Figure 2

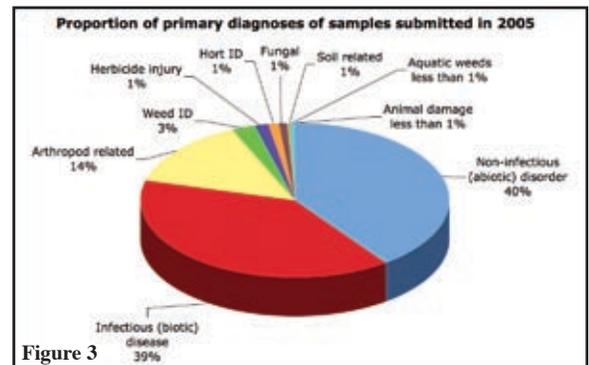


Figure 3

Ft. Detrick, MD. Funding for purchase of a Cepheid Smartcycler was obtained through the USDA-APHIS Cooperative Agriculture Pest Survey (CAPS) program, and a separate laboratory room was set up for real-time PCR procedures.

In March 2005, Karen and Gail, along with Ray Martyn, Greg Shaner, Dan Egel, and Indiana state and federal regulatory personnel participated in a soybean rust detection exercise organized by the National Plant Diagnostic Network. A photograph served as a suspect sample, and movement of the sample from grower to the Plant and Pest Diagnostic Lab, to USDA-APHIS specialists for confirmation of rust was tracked through the NPDN Scenario Exercise website. Communications about the potential sample and confirming diagnosis with the Indiana State Plant Regulatory Official and USDA State Plant Health Director were also tracked on the website. The exercise was an excellent way to inform all concerned parties of the proper pathway for samples and communication of results when the first case of Asian soybean rust is found in Indiana.



In addition to Asian Soybean Rust, first detector training efforts focused on Ramorum blight (also called Sudden Oak Death), a disease that is causing significant losses in forested areas of California and Oregon. Gail and Karen provided training sessions to landscapers, nursery and extension personnel in Indiana. The two, with participation from Glenn Nice (Weed Science/Dept. of Botany and Plant Pathology) and Dr. Cliff Sadof (Department of Entomology), also conducted an IP video training session for ANR educators with the intent of improving their surveillance capabilities for Ramorum blight as well as for other potential invasive plant diseases and pests in Indiana, including Emerald Ash Borer, giant hogweed, and soybean rust. Educators who participated in the four-hour training session were registered with the NPDN as First Detector Educators, providing them with the information necessary to train others to detect these important pests and diseases.

#### **COOPERATION WITH THE INDIANA DEPARTMENT OF NATURAL RESOURCES AND INDIANA CROP IMPROVEMENT ASSOCIATION**

The P&PDL serves as the plant disease diagnostic facility for the Indiana Department of Natural Resources (IDNR), and thus work together during outbreaks of diseases of regulatory concern. In 2005, Gail conducted testing for 801 samples from Indiana nurseries for the presence of *Phytophthora ramorum*, the microorganism that causes Ramorum blight, as part of the 2005 National *P. ramorum* Nursery Survey. All samples tested negative for the presence of *P. ramorum*.

Since 1995 the P&PDL has been cooperating with the IDNR and Indiana Crop Improvement Association (ICIA) in a project to verify the accuracy of field inspections for phytosanitary certification of corn and soybeans for export. Gail provided hands-on training sessions for field inspectors prior to this year's field season to help inspectors learn to recognize common foliar disease symptoms, and then provided disease diagnosis on the corn and soybean samples submitted by field inspectors as a part of the 2005 IDNR Phytosanitary Certification Program. The P&PDL also provided the disease diagnosis of foliar pathogens on corn submitted by inspectors for entry into the National Agricultural Plant Information System (NAPIS) database. Karen provided confirmation of *Peronospora tabacina* to the IDNR on tobacco samples submitted as a part of the 2005 Tobacco Blue Mold Field Survey.

#### **DIAGNOSTIC TRAINING FOR MOROCCAN BORLAUG FELLOWSHIP PROGRAM**

The P&PDL plant disease diagnosticians participated in the 5-week Borlaug fellows training program for three visiting plant pathologists from Morocco, directed by Dr. Ron Coolbaugh. Gail and Karen provided an orientation to the Plant and Pest Diagnostic Laboratory (P&PDL) and the National Plant Diagnostic Network, and Karen instructed the scientists on the use of real time PCR in plant disease diagnosis.

<http://www.ppdl.purdue.edu/ppdl/>

# SWPAC HIGHLIGHTS

## Hurricanes Affect Indiana Weather in 2005

Many years from now, old timers may refer to 2005 as the year when four hurricanes struck Indiana. Meteorologists may object: by the time the storms actually struck Indiana they were no longer hurricanes and Arlene never made it beyond a tropical storm. Nevertheless, it has been a weather year to be remembered. It is not clear if four such storms have ever struck Indiana (In 1979 two former hurricanes wandered into Indiana). Folks whose business had anything to do with agriculture know that Arlene, Dennis, Katrina, and Rita affected more than just the Gulf States. After crashing ashore, eventually all four storms tracked across the Hoosier State. (Figure 1.)

Hurricane Arlene provided 3.81 inches of rainfall during flowering and early fruit set of muskmelon/watermelon-crops. Arlene's rainfall did increase the incidence of foliar diseases such as gummy stem blight and Alternaria leaf blight.

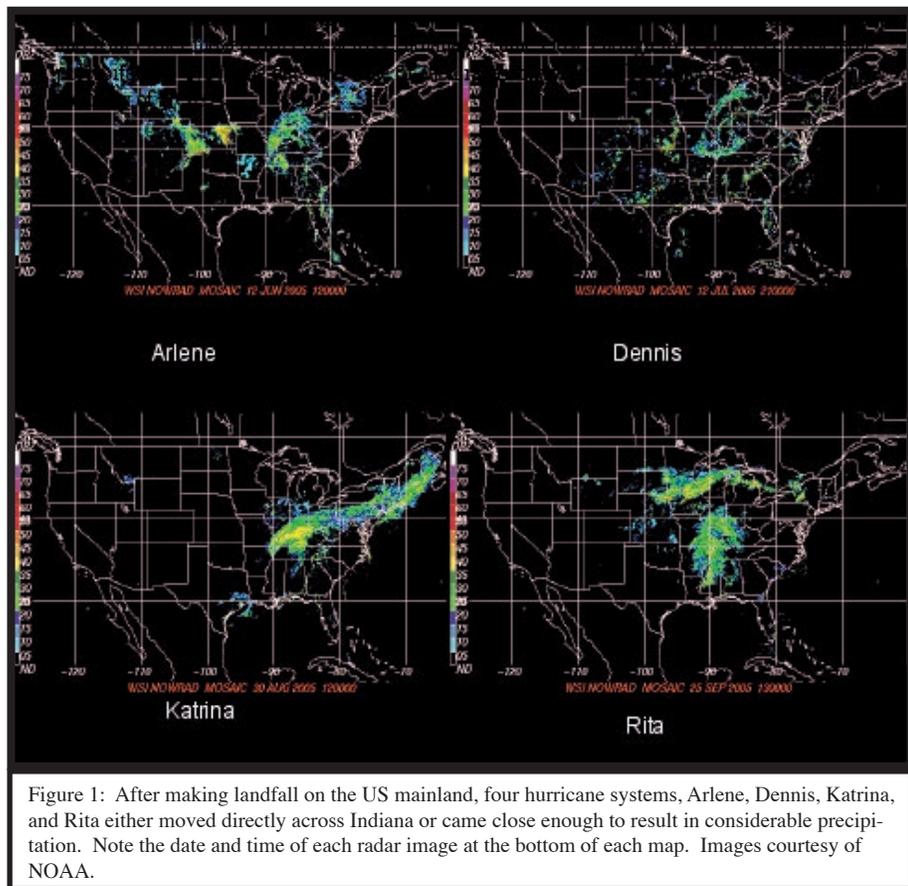
Unfortunately, the rainfall events from Arlene were the last southern Indiana were to see for 14 days, depending on the area. The growing conditions during the last week of June were very dry with above normal temperatures. Vines were observed wilting and some fruit were aborted during this time. Watermelon vines were particularly hard hit since many commercial fields are not irrigated.

The weather system that had been Dennis hovered about the Midwest for a few days, adding much needed rainfall. Vines began to grow again and fruit set continued. The added rainfall did bring higher foliar disease pressure. A few growers reported vine death of watermelons in water logged areas of their fields. However, there were no widespread reports of mature watermelon vine decline. After Dennis, rainfall levels were fairly low until the end of the season, Hurricane Katrina dumped huge amounts of rainfall across the southern portion of Indiana. At SWPAC, 3.3 inches were recorded in a 24 hour period. Since the season was almost over for muskmelons and watermelons, the rainfall had little effect.

The rainfall from the remnants of Arlene came during planting and vegetative growth of pumpkins. Although some areas of pumpkins had to be replanted, the rainfall was not detrimental. The hot, dry weather between Arlene and Dennis inhibited early fruit set of pumpkins. Late planted pumpkins suffered from poor stand establishment. Dennis brought needed rainfall, even if many farmers would have preferred a more even distribution of rainfall. The predominate disease in pumpkins in early July is powdery mildew which does not require rainfall for establishment or spread. The rains which accompanied Katrina and Rita came to southern Indiana when fruit were maturing. The result has been that pumpkins, which are planted in heavier ground than muskmelons or watermelons, suffered from a variety of fruit rots including Fusarium fruit rot and Phytophthora fruit rot. Downy mildew of cucurbits was reported in southern Indiana in August. The rains of Katrina and Rita contributed to the onset and spread of downy mildew.

The dry weather in June caused much concern among corn and soybean farmers. However, for much of the state, Arlene and Dennis provided needed relief. The excess moisture provided by Katrina and Rita came after silking and blooming; thus, flowering and fruit set were not severely affected. However, the heavy rains and wind did cause some lodging of corn and soybean.

Research done at SWPAC focuses on the needs of growers, particularly on increasing horticultural and agronomic crop quality and yields, and decreasing expenditures and pesticide use. **Dr. Dan Egel** serves as the director of the center, with the assistance of Dr. Chris Gunter, Dr. Charles Mansfield, and Dr. Ken Scheeringa.



# 2005 NEW ALUMNI



## **MIN-WEN CHENG**

**Master of Science**

Major Professor: Don Huber

Thesis Title: "Mn transition states during infection and early pathogenesis in rice blast relative to resistance and susceptibility"

*Min-Wen is continuing her studies towards a Ph.D. here at Purdue in the Department of Food Science.*

## **CAMERON COOLEY**

**Master of Science**

Major Professor: Charles Woloshuk

Thesis Title: "A model method for studying growth, polyol content, and gene identification associated with osmotic adjustment in *Eurotium rubrum*"

*Cameron is a 7th grade teacher at a Longview Middle School teaching General Science in Memphis, Tennessee.*



## **SARAH KESSANS**

**Bachelor of Science**

Major: Plant Biology

*Sarah is taking the next year to train and compete in the Woodvale Events Atlantic Rowing Race. She will be attending graduate school in fall 2006 at Arizona State University.*

## **LEI LI**

**Doctor of Philosophy**

Major Professor: Jin-Rong Xu

Thesis Title: "Identification and characterization of specifically or highly expressing *Magnaporthe grisea* genes during fungal-host interactions"

*Lei Li is doing practical training in Dr. Xu's lab and working to publish her research data.*



## **ANTONIO TROCHE**

**Bachelor of Science**

Major: Environmental Plant Studies

*Tony has accepted a position as an ecological consultant at J.F. New in Walkerton, Indiana.*

## **KATHRYN WILKINSON**

**Doctor of Philosophy**

Major Professor: Carole Lembi

Thesis Title: "The ecology, physiology, and biological control of mat-forming cyanobacteria"

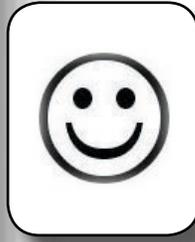
*Katie accepted a position at Coker College in South Carolina as an adjunct assistant professor.*



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# 2005 UNDERGRAD STUDENTS

## MAJOR - PLANT BIOLOGY



Colligan Barber  
Louisville, Kentucky



Fred Beckman  
Hebron, Indiana



Heather Becraft  
Granger, Indiana



Matthew Caldwell  
Columbus, Indiana



Janelle Donahue  
Evansville, Indiana



Joshua Haun  
Dyer, Indiana



Ryan Henry  
Columbus, Indiana



Cornelia Koten  
Berlin, Germany



Adam Leonberger  
Indianapolis, Indiana



Priyansh Mathur  
Centreville, Virginia



Kendra Meade  
Ft. Branch, Indiana



Rachel Mertz  
W. Lafayette, Indiana



Emily Overton  
W. Lafayette, Indiana



Yenny Suanthie  
Surabaya, Indonesia



## MAJOR - ENVIRONMENTAL PLANT STUDIES



Jennifer Dudash  
Kokomo, Indiana



Lauren Greig  
Evansville, Indiana



Diana LaRiva  
Tustin, California



Patti Quackenbush  
Fort Wayne, Indiana



Tony Troche  
Fremont, Indiana

## MAJOR - CROP PROTECTION



John McMillan  
Greenfield, Indiana



Austin Schwark  
Lafayette, Indiana



*Excellence Through Diversity*

# UNDERGRADUATE HIGHLIGHTS

## Undergraduates Receive Recognition for Their Academic Excellence

The Department of Botany and Plant Pathology has a small group of undergraduate students who are gifted, talented, disciplined and very hard-working. Many of these students are honored each semester for their academic excellence by being on the Dean's List and receiving semester honors. They also have the opportunity for scholarship awards because of their strong academic credentials. Below is the list of Botany and Plant Pathology Undergraduates who received scholarship awards from Purdue University, the College of Agriculture and the Department of Botany and Plant Pathology. Congratulations to each of them.



### *Freshman Awards*

**Scholarship Awards of Excellence:** *Ryan Henry*

**Botany and Plant Pathology Freshman Awards:** *Ryan Henry and Emily Overton*

### *Sophomore Awards*

**Purdue Academic Success Award:** *Rachel Mertz*

**Milligan Agricultural Scholarship:** *Rachel Mertz*

**College of Agriculture Sophomore Awards:** *Rachel Mertz and Adam Leonberger*

**Lewis Runkle Scholarship:** *Adam Leonberger*

**Botany and Plant Pathology Sophomore Awards:** *Rachel Mertz and Adam Leonberger*

### *Junior Awards*

**College of Agriculture Junior Awards:** *Kendra Meade*

**Botany and Plant Pathology Junior Awards:** *Kendra Meade and Heather Becraft*

**2005-06 Outstanding Undergraduate Students**

| Senior  | Junior  | Sophomore   | Freshman   |
|---|---|---|--|
|  |  |  |  |
| <b>Kendra Meade</b><br>West Lafayette, Indiana                                      | <b>Heather Becraft</b><br>Granger, Indiana  | <b>Rachel Mertz</b><br>West Lafayette, Indiana                                      | <b>Ryan Henry</b><br>Columbus, Indiana   |
| Major: Plant Biology  | Major: Plant Biology  | Major: Plant Biology  | Major: Plant Biology   |

 **Department of Botany and Plant Pathology**

*Your Door to Discovery*

# 2005 GRADUATE STUDENTS



**Synan Abu Qamar**  
Ph.D. Student  
Amman, Jordan



**Khaldoun Al-Hadid**  
Ph.D. Student  
Amman, Jordan



**Jon Armstrong**  
M.S. Student  
Muscotah, Kansas



**Muthu Balasubramaniam**  
Ph.D. Student  
Chennai, India



**Burt Bluhm**  
Ph.D. Student  
Starkville, Mississippi



**Rahul Dhawan**  
Ph.D. Student  
Punjab, India



**Braham Dhillon**  
Ph.D. Student  
Luhhiana, India



**Richard Dirks**  
Ph.D. Student  
W. Lafayette, Indiana



**Chad Dyer**  
M.S. Student  
Freedom, Indiana



**Qiang Gao**  
Ph.D. Student  
Hangzhou, China



**Emily Indriolo**  
Ph.D. Student  
Canton, Ohio



**Hun Kim**  
Ph.D. Student  
Uijeongbu, S. Korea



**Yangseon Kim**  
Ph.D. Student  
Suwon, S. Korea



**Preekamol Klanrit**  
Ph.D. Student  
Mueng Udonthani, Thailand



**Sarah Knapke**  
M.S. Student  
Rockville, Indiana



**Nithu Nair Remadevi**  
M.S. Student  
Chennai, India



**Rachel Nodurft**  
M.S. Student  
W. Lafayette, Indiana



**Eric Ott**  
M.S. Student  
Prairie Du Sac, Wisconsin



**Daljit Singh**  
Ph.D. Student  
Chadigarh, India



**David Smith**  
Ph.D. Student  
Bremen, Indiana



**Renate Wuersig**  
M.S. Student  
Belfast, New York



**Hugh Young**  
Ph.D. Student  
Bellefonte, Pennsylvania



**Xinhua Zhao**  
Ph.D. Student  
Zhejiang, China



**Zuyu Zheng**  
Ph.D. Student  
Beijing, China

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# 2005 GRADUATE STUDENTS



**Clay Britton**  
Ph.D. Student  
Overland Park, Kansas



**J. Earl Creech**  
Ph.D. Student  
Lewiston, Utah



**Isaac Curtis**  
M.S. Student  
Morgantown, Indiana



**Vince Davis**  
M.S. Student  
Malcomb, Illinois



**Amanda Deering**  
Ph.D. Student  
Mt. Pleasant, Michigan



**Luke Gumaelius**  
Ph.D. Student  
Salem, Indiana



**Emily Helliwell**  
Ph.D. Student  
Plymouth, Minnesota



**David Hillger**  
Ph.D. Student  
Peebles, Ohio



**Amber Hopf**  
M.S. Student  
Petersburg, Indiana



**Amr Ibrahim**  
Ph.D. Student  
Giza, Egypt



**Greg Kruger**  
M.S. Student  
Mount Gilead, Ohio



**Kristin Laluk**  
Ph.D. Student  
Fountain Hills, Arizona



**Ryan Lee**  
Ph.D. Student  
Bedford, Indiana



**Zhenghua Luo**  
Ph.D. Student  
Guangzhou, China



**Dair McDuffee**  
M.S. Student  
Fishers, Indiana



**Justin Stewart**  
M.S. Student  
Berne, Indiana



**Janani Varadarajan**  
Ph.D. Student  
Chennai, India



**K. M. Vinod**  
Ph.D. Student  
Trichur, India



**Jeremy Weber**  
M.S. Student  
Brookville, Indiana



**Andrew Westhoven**  
M.S. Student  
Liberty Center, Ohio

## 2005 Graduate Students

We currently have 44 graduate students seeking advanced degrees from our department. They come from all parts the world. We have 12 students from Indiana, 15 students from other U.S. states and 20 students from outside the U.S. States and countries represented are: Arizona, Illinois, Indiana, Kansas, Michigan, Minnesota, Mississippi, New York, Ohio, Pennsylvania, Utah, Wisconsin, China, Egypt, India, Jordan, South Korea, and Thailand.

# GRADUATE STUDENT HIGHLIGHTS

## Kruger Honored with the 2005 Indiana Seed Industry Graduate Study Award

**Greg Kruger** was selected to receive the 2005 Indiana Seed Industry Graduate Study Award. This well deserved honor reflects the high value the seed industry places on Kruger's research. Greg is a master's student studying the distribution of root knot nematode in Indiana and soybean cultivars that have resistance to root knot nematode, under the direction of Dr. Andreas Westphal.



Dr. Marshall Martin presents Greg Kruger with the 2005 Indiana Seed Industry Award.

The awards presentation banquet was held during the annual meeting of the Indiana Crop Improvement Association in February 2005 at the Sheraton North Hotel at Keystone at the Crossing in Indianapolis, Indiana.

Greg received a \$3,000 cash award to support his program of study. This award is made possible by the Ag Alumni Seed Improvement Association, the Indiana Crop Improvement Association, the Indiana Seed Trade Association, and the Public Varieties of Indiana.

Dr. Andreas Westphal, Dr. Lijuan Xing, Dr. and Mrs. Ray Martyn, and Melissa Kruger (Greg's wife), were at the event as Greg received this prestigious award.



The Westphal Lab attends the awards ceremony at the Sheraton North. (L to R) - Dr. Lijuan Xing, Melissa Kruger, Greg Kruger, and Dr. Andreas Westphal.

Our department has been extremely fortunate to have several of our graduate students honored with this award. Dr. Joe Flaherty received the 2002 award, Burt Bluhm was honored in 2004, and Greg Kruger in 2005.

## Students Receive Awards at North Central Weed Science Society Annual Meetings in December

The 2005 NCWSS Annual Meetings were held in Kansas City, Missouri. Students who participated in the paper and/or poster contest did an outstanding job. Two graduate students and one undergraduate research assistant from our department received recognition.

**Joe Armstrong**, M.S. student with Dr. Kevin Gibson, placed first in the NCWSS Student Paper Award for Group III. His paper was titled, "Classification of early-season multispectral images for low-density weed detection in corn." **Earl Creech**, Ph.D. student with Dr. Bill Johnson, placed first in Group II in the student poster awards. His poster was titled, "Fall and spring development of soybean cyst nematode on winter annuals weeds in the eastern corn belt." **Valerie Mock**, undergraduate research assistant with Dr. Bill Johnson, placed second in the undergraduate student poster awards. Her poster was titled, "Response of selected Indiana horseweed (*Conyza canadensis*) populations to 2,4-D rates." Valerie will begin her studies toward a M.S. with Johnson in the summer of 2006.



*The Meristem*

## Armstrong Named the 2005 Outstanding Teaching Assistant Award Winner

**Jon-Joseph Armstrong** received the 2005 Outstanding Teaching Assistant Award for the Department of Botany and Plant Pathology at the annual banquet for the Celebration of Graduate Student Teaching in April 2005. Joe was one of 63 teaching assistants honored. Each honoree received an engraved plaque in recognition of their teaching excellence.

Joe joined our graduate program in the fall of 2004. He served as a teaching assistant during his first two semesters on campus in BTNY 210, Introduction to Plant Science and BTNY 304, Introductory Weed Science. He is a M.S. student with Dr. Kevin Gibson, and his research is focused on the remote sensing of early season weeds in corn using aerial images.



## New Members Inducted into Gamma Sigma Delta

Congratulations to the 2005 Gamma Sigma Delta inductees. This group of department students and one faculty member were honored at a reception at Purdue University on April 5, 2005. Gamma Sigma Delta is an Agricultural Honor Society which encourages high standards of scholarship and worthy achievements in all branches of the agricultural and related sciences as well as a high degree of excellence in the practice of agricultural pursuits.

FACULTY: Dr. Jin-Rong Xu

GRADUATE STUDENTS: Earl Creech, Vince Davis, Synan Abu Qamar, David Smith, Janani Varadarajan, K.M. Vinod, Hugh Young, Xinhua Zhao, and Zuyu Zheng

UNDERGRADUATE STUDENT: Sarah Kessans



2005 Gamma Sigma Delta induct: (L to R) - David Smith, Sarah Kessans, Vince Davis, Earl Creech, Hugh Young, and Janani Varadarajan.

## Kansas State University Hosts NCWSS Weed Science Contest

The department sent six individuals to the NCWSS Weed Science Contest in Manhattan, Kansas to represent Botany and Plant Pathology and Purdue University. The team was comprised of three graduate students; **Vince Davis**, **Eric Ott**, **Joe Armstrong**, and three undergraduate students; Valerie Mock, **Janelle Donahue**, and **John McMillan**.

The team of Vince Davis, Eric Ott, Joe Armstrong, and Valerie Mock, placed fourth out of seven teams. Vince Davis placed third overall as a graduate student individual, and tied for third place in both the weed identification and the written calibration sections. Eric Ott placed eighth overall as a graduate individual, and tied for second in unknown herbicide identification. Joe Armstrong placed 10th overall as a graduate individual, and tied for second in unknown herbicide identification and tied for third in the written calibration section. Valerie Mock placed fourth overall as an undergraduate individual, and placed second in both the weed identification and unknown herbicide sections. The team coaches this year were **Dr. Bill Johnson** and Ph.D. graduate student **Earl Creech**.

One of our new graduate students, **Andy Westhoven**, was on the first place overall undergraduate team from Ohio State University and Andy also placed second overall as an undergraduate individual. Former graduate student **Darrin Dodds** (M.S. 2002), was on the second place overall graduate team from Mississippi State University where Darrin is a current Ph.D. student. This team also placed first in field sprayer calibration.

# GRADUATE STUDENT HIGHLIGHTS

## Burt Bluhm Recognized with the Outstanding Ph.D. Student Award

The 2005 Outstanding Ph.D. Student has a remarkable track record. **Burt Bluhm** received his B.S. in chemistry, Magna cum laude, from the University of Oklahoma in 1999 and came to Purdue on an NSF Training Fellowship. After a year, he joined Charles Woloshuk's lab and completed his M.S. degree in 2003. He also was named the department's outstanding M.S. student that year. He continued on with Dr. Woloshuk for his Ph.D. degree, which he will receive in May 2006. During his M.S. and Ph.D. studies, Burt has maintained an outstanding GPA.

His Ph.D. research focuses on understanding how the mycotoxin fumonisin is regulated in the fungus *Fusarium verticillioides* during colonization of corn kernels. He has received

numerous awards during his tenure here, including an Andrews Fellowship, two different named travel awards to the annual meeting of the APS, the Indiana Crop Improvement Association graduate scholarship, and, as indicated earlier, our department's outstanding M.S. student award. He is just finishing up this semester as a teaching assistant for Dr. Xu's course, Biology of Fungi.

Burt became a resident expert in real-time PCR and has shared that expertise with numerous students and post docs in our department and others. He has published six manuscripts as senior or co-author from his time in the Woloshuk lab. In addition to his own research project, Burt collaborated with Dr. Mengiste in the characterization of plant defense mechanisms against pathogens. This has resulted in two additional manuscripts as co-author. One in *The Plant Journal*, and one that has been accepted for *The Plant Cell*. Burt also has at least one more from his own research being prepared. Nine journal articles in five years for a graduate student is truly exceptional.

Burt has also been active in the department and his professional society, APS. He was a member of the department seminar committee, as well as an active participant in SpringFest and graduate student recruiting. He has served as a reviewer for APS student travel award applications, he has been an ad hoc reviewer of manuscripts submitted to the journal *Mycologia*, and he has been a volunteer for the APS Foundation. Burt has accepted a post-doc position in the laboratory of Dr. Larry Dunkle beginning in the spring of 2006.

As the department's Outstanding Ph.D. Student, Burt received a \$300 cash award, a personal plaque, and a name plate on the departmental plaque.



### Department of Botany and Plant Pathology Outstanding Ph.D. Students 1996 - 2005

1996 - J. David McGee

1997 - Steve Fennimore

1998 - Sze-Chung "Clive" Lo

1999 - Won-Bo Shim

2000 - Claudia Vergara

2001 - Barbara Hass

2002 - Philip Harmon

2003 - Joseph Flaherty

2004 - Lei Li

2005 - Burton Bluhm

# GRADUATE STUDENT HIGHLIGHTS

## Outstanding M. S. Graduate Student Award Presented to Mr. Cameron Cooley

This year's Outstanding M.S. Student is **Cameron Cooley**. Cameron came to Purdue in the fall of 2002 after completing his B.S. in biology from Middle Tennessee State University. He was a teaching assistant his first year and then joined Dr. Woloshuk's lab where he investigated the effects of moisture on fungal colonization of stored grain. He developed assays to measure growth and polyol accumulation in expression of several genes. A manuscript detailing his research was published in the journal *Mycologia*. One reviewer commented that "This is one of the most innovative approaches I have seen in 35 years of research on the ecology of stored product molds." In addition to his research, Cameron was an exceptional teaching assistant. He served as a teaching assistant for two semesters and was recognized as the department's outstanding TA in 2004. Cameron successfully completed his M.S. degree this past August.



Cameron was also involved in the department's minority recruitment efforts. Cameron recognized his potential and opportunity to serve as a positive role model for African American students interested in graduate school. He accompanied faculty on two trips to Alabama A & M University and Tuskegee University in an effort to improve departmental relationships with Historically Black Colleges and Universities. During these visits he presented talks on his research and on life as a graduate student at Purdue. He was also involved with the MARC-AIM program on campus and served as a mentor for minority students through the Black Cultural Center. While he was here, he met the love of his life, Kristie and they were married last year. This past June, Cameron and Kristie were blessed with a baby boy.

After graduation, Cameron accepted a job as a science instructor at Longview Middle School in Memphis, Tennessee. There he is serving as an excellent instructor and role model. He also is the webmaster for the Longview Middle School and has been recognized by the Apple Corporation as an Apple Distinguished Educator at Memphis City School's Teaching and Learning Academy. He has the future goal of starting his own private school. Cameron is the quintessential southern gentleman, an excellent student, and just a great person.

The Outstanding M.S. Award recipient receives a personal engraved plaque, a name plate on the departmental plaque and a \$200 cash award. Cameron was not able to attend the poster session due to his teaching responsibilities in Memphis.

### Department of Botany and Plant Pathology Outstanding M.S. Students 1996 - 2005

1996 - Marshall Beatty

1997 - John Cavaletto

1998 - Joseph Marencik & Alex Cochran

1999 - Ian Thompson

2000 - Lee Ann Glomski

2001 - Amanda Gevens

2002 - Carrie Lapaire

2003 - Burton Bluhm

2004 - Vince Davis

2005 - Cameron Cooley

Your Door to Discovery

## Biography Traces History of Purdue Agriculture Professor

**Dr. Fred Whitford**, Director of the Purdue Pesticide Programs, and **Dr. Andrew Martin**, Pesticide Program Specialist, wrote “The Grand Old Man of Purdue University and Indiana Agriculture” in tribute to William Carroll Latta.

This is a biography that tracks Latta’s professional, personal, and volunteer work. He is recognized as the father of the College of Agriculture at Purdue where he became only the second professor of agriculture in 1882. In his 54 years at Purdue, Latta started the four-year undergraduate program and founded the Farmer’s Institutes, the precursors of Purdue Extension, and wrote most of Purdue’s earliest agriculture research publications.

According to Whitford, approximately five million Indiana farmers were trained through Latta’s outreach programs. Latta worked hard to get science-based agriculture techniques to the farmers who needed them. He also initiated on-farm research and offered winter short courses for farmers who couldn’t attend the university’s two or four-year programs.

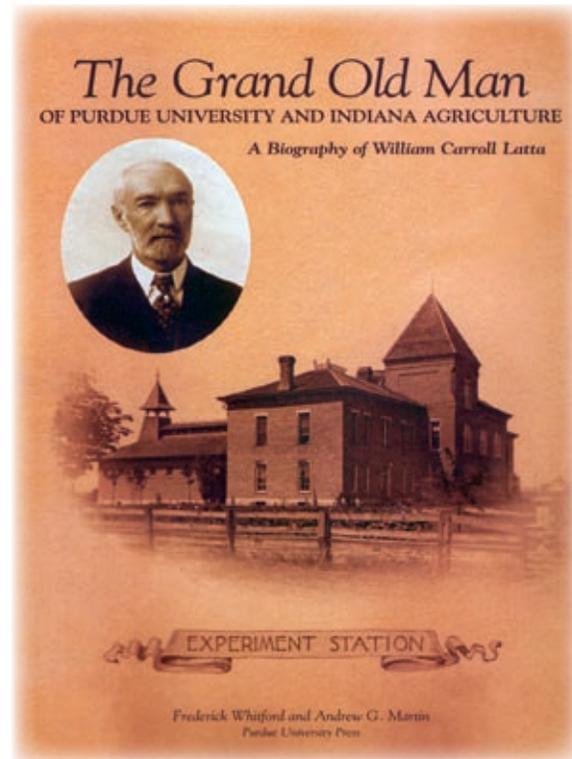
Latta’s research dealt with corn, wheat, and oats, but his lessons can still be applied to Purdue Extension as a whole. “We found that what we do today is still guided by the same philosophy he used back then,” Whitford said. “Which is that Indiana citizens’ interests are our interests.” Whitford also stated “Not only will this biography help students, but it will be of interest to farmers and every member of the agricultural community.”

To purchase a copy of “The Grand Old Man of Purdue and Indiana Agriculture,” you can call the Purdue University Press at (800) 247-6553 or go online <[www.thepress.purdue.edu](http://www.thepress.purdue.edu)>. The book is also available through online book retailers. Proceeds from the sale of this book support the W.C. Latta Scholarship fund at Purdue University also established by Dr. Fred Whitford.

The Latta Scholarship was established in early 2005 with \$10,000 of voluntary funds from the program of Dr. Fred Whitford. The Purdue Pesticide Programs has a broad Extension and educational mission at Purdue University. Whitford believes that a scholarship for a senior student in the College of Agriculture would be consistent with the mission of educating the public and helping individuals succeed in their chosen professions.

Once the endowment reaches the minimum requirement of \$20,000, the scholarship will recognize senior students who have attained high achievement in the classroom and displayed leadership in their community and at Purdue University. This scholarship would complement another proposed award, the Latta Society. At this time, the society is just a concept and under development. The purpose of the society would be to induct individuals who have given \$500,000 in their lifetime to the College of Agriculture. This would promote relationships between those who give to the College of Agriculture and students who have shown early potential in their careers. This illustrates quite well how this scholarship can provide a link between those that are starting their career and those that have been successful due to their education at Purdue University.

For those interested in more information regarding the Latta Scholarship, please contact Dr. Fred Whitford at the Department of Botany and Plant Pathology, 915 W. State Street, West Lafayette, IN 47907-2054, (765) 494-1284, or via email at [fwhitford@purdue.edu](mailto:fwhitford@purdue.edu).



Latta’s story traces the history of agriculture at Purdue, showing agriculturists, historians, and the Purdue community where we’ve been and the foundation upon which we continue to build today’s teaching, research, and Extension programs.

# DEPARTMENT HIGHLIGHTS

## Summer Research Programs Successful and Fun for Students and Department

The department hosted two summer research programs in 2005. These programs are designed for the serious undergraduate student interested in graduate school and who wishes to learn more about the excitement of research in the plant sciences.

Dr. Nick Carpita hosted nine students in his summer program funded by the National Science Foundation, and the department funded six students who were hosted by individual faculty members in the department. Those hosting students in their labs were: Tesfaye Mengiste, Guri Johal, Bob Pruitt, Zhixiang Chen, and Jody Banks. Once again, Muthu Balasubramaniam served as the student mentors to this group and did a fantastic job.

The two programs, along with students from the MARC/ AIM program, interacted on many occasions during the 8-week program. The students had the opportunity to participate in GRE workshops, weekly lunches with faculty mentors, after hours festivities, and weekend excursions.

The departmental and NSF programs ended the summer program with a poster session in the Deans Auditorium in Pfindler Hall. Faculty, staff, students, post-docs, and administrators attended the afternoon gathering. The interns all prepared great posters and answered the many questions posed to them at the session.

The program continues to be a success. Several of these outstanding students have joined graduate programs at Purdue and several others will start in the fall of 2006.



Botany and Plant Pathology Summer Research Interns (L to R): Katrina DeShaney (Mengiste), Jessica Henty (Banks), Crystal Davis (Pruitt), Hillary Hayes (Johal), Joe Mazzawi (Chen), and Renate Wuersig (Pruitt).



National Science Foundation Research Interns working with Nick Carpita and his group: Front row (L to R): Libby Teerseck, Rachel Mertz, Satoko Kanahara, and Sandra Wheeler. Back row (L to R): Rachel Andrews, Nick McKeehan, Ryan Albright, Thomeka Nelson, and Jenny Moulton.



Not only did the summer interns do outstanding research and learn about Purdue University, they took in many of the surrounding sights. They visited the Indianapolis Brickyard and Museum, the Indianapolis Artsgarden and Circle Center Mall, and they also attended the Taste of Tippecanoe, and the Taste of Chicago just to name a few. They really enjoyed their summer at Purdue.

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# DEPARTMENT HIGHLIGHTS

## Martyn's Serve Up Last Texas BBQ to Post-Docs and Graduate Students

For the past seven years Ray and Carol Martyn have hosted their "Annual Fall BBQ and Killer Dart Tournament" in September for departmental post-docs and graduate students and their families. They wine and dine this group on good old fashion Texas cooking and spirits. Ray, Carol, all the graduate students and post-docs looked forward to this annual event. It was a great tradition that the Martyn's started soon after they arrived in West Lafayette.

The 2005 Killer Dart Champions were Eric Ott and Ian Thompson. These two will forever hold the title of the reigning Killer Dart Champions in the Department of Botany and Plant Pathology. A special thanks to the Martyn's for all the time and effort they put into this special event each year.



Excellence Through Diversity



# DEPARTMENT HIGHLIGHTS

## 1st Annual Botany and Plant Pathology Graduate Student Organization Charity Golf Scramble

The Botany and Plant Pathology GSO Charity Golf Scramble was a huge success! In an effort to raise funds for the American Red Cross to assist hurricane victims, a number of graduate students and staff helped to plan, organize, and run the event in a little over two-weeks time. Through the support of the department, this group was able to raise over \$800 to go directly to the American Red Cross. The greater Lafayette community also welcomed the challenge with several businesses lending support for prizes and refreshments. On October 1st, 2005, the Lafayette Municipal Golf Course hosted the scramble. There were nine golfing participants. The teams were: Team 1 - Steve Hallett, Joe Anderson, and George Buechley; Team 2 - Joe Armstrong, Dave Hillger, and Ryan Bonnell; and Team 3 - Ron Coolbaugh, Frank Oreovicz, and Clay Britton. Frank is a staff member in the chemical engineering department who heard about the tournament through the golf course's web page. Frank and Ron carried teammate, Clay, who had never played a hole of golf in his life; with friendly coaching and ribbing along the way, they finished 5 over for the day. Next came the team of Armstrong, Hillger and Bonnell at 4 over. Bonnell, while attempting a daring Indiana Jones inspired maneuver, snapped his driver shaft in half while chasing after a runaway golf cart. The team of Hallett, Anderson, and Buechley won the day shooting an even par, leaving everyone else with an ear full as Hallett sauntered off the course. After golfing, a pizza lunch and prizes were distributed. Overall, the scramble was a huge success. Most importantly, donations were raised to assist those on the Gulf Coast. The success of this event will hopefully add to the allure of the 2nd Annual Botany and Plant Pathology Golf Scramble in 2006.



Sarah Knapke (R) with friend, Tom, encourage the golfing community to donate to this worthy cause.



Graduate students, Mandy Deering and Kristen Laluk give first time golfer, Clay Britton, moral support.



(L to R) - Joe Anderson, George Buechley, Steve Hallett, Clay Britton, Sarah Knapke, Jessica Young, and Hugh Young.



Dave Hillger gets ready to tackle the course.



Joe Armstrong and Dave Hillger watch as Ryan Bonnell sinks the putt. I wonder where the golf cart is?



Group photo before Clay told Ron and Frank he's never played golf before.



Dave Hiller, Steve Hallett, and Joe Anderson share a laugh in the clubhouse.



George Buechley and Ron Coolbaugh relax after a great day of golf!



Ryan Bonnell with his broken golf club.



The winning team (L to R): Joe Anderson, George Buechley, and Steve Hallett.

# DEPARTMENT HIGHLIGHTS

## Annual Poster Session Enjoyed By All

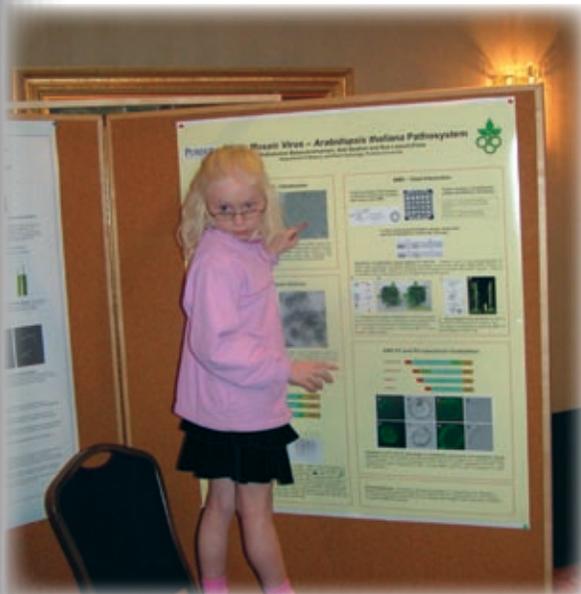
The Annual Graduate Student/Post-Doc Poster Session is always a highlight of the fall semester.

Faculty, graduate students, and post-doctoral researchers showcase the latest and greatest research being done in the Department of Botany and Plant Pathology.

Forty research posters were on display as the group of approximately 90 people spent the evening socializing and sharing their research with fellow colleagues. It is also a time for all the new students and post-docs to interact with others in the department in different disciplines.

The evening was also the time to announce the 2005 Outstanding M.S. and Ph.D. Students. The students selected for these awards were: **Cameron Cooley**, Outstanding M.S. Student and **Burt Bluhm**, Outstanding Ph.D. Student. More information on the achievements of these students is available on pages 52 and 53.

The Sustained Achievement in Excellence Award was presented to **Dr. Robert Pruitt**. Dr. Ray Martyn created this award in 2003 to recognize a faculty member who excels in the discovery, learning and engagement missions of the university over a five-year period. This is only the second presentation of this award. More information on Bob Pruitt's achievements is available on page 16.



# DEPARTMENT HIGHLIGHTS

## Department Gathers For Annual Chili Cook-Off and Holiday Gathering

The Annual Chili Cook-off is a time for the department to celebrate the end of the fall semester and to gear up for the upcoming holiday season.

It is an event that everyone participates in and enjoys.

Once again we had many adventurous chili cooks and Lilly Hall smelled delicious. A dozen pots of chili were sampled by the group and three cooks were honored for their creations. First place went to Ron Coolbaugh, second place honors to Nick Carpita, and third place went to new graduate student, Renate Wuersig. Along with the chili, there were several tables of holiday goodies for everyone to enjoy.

In the spirit of giving, the department always participates in a holiday charity. This year the program was "Christmas for Everyone." The American Red Cross and area Christian Churches partner together with the community to provide gifts to over 1500 needy children in the greater Lafayette and West Lafayette area. The department rose to the occasion, as it always does. Over 100 toys, books, and clothing items, plus \$160 in cash was donated to this worthy cause. A special thanks to everyone for their generosity.



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