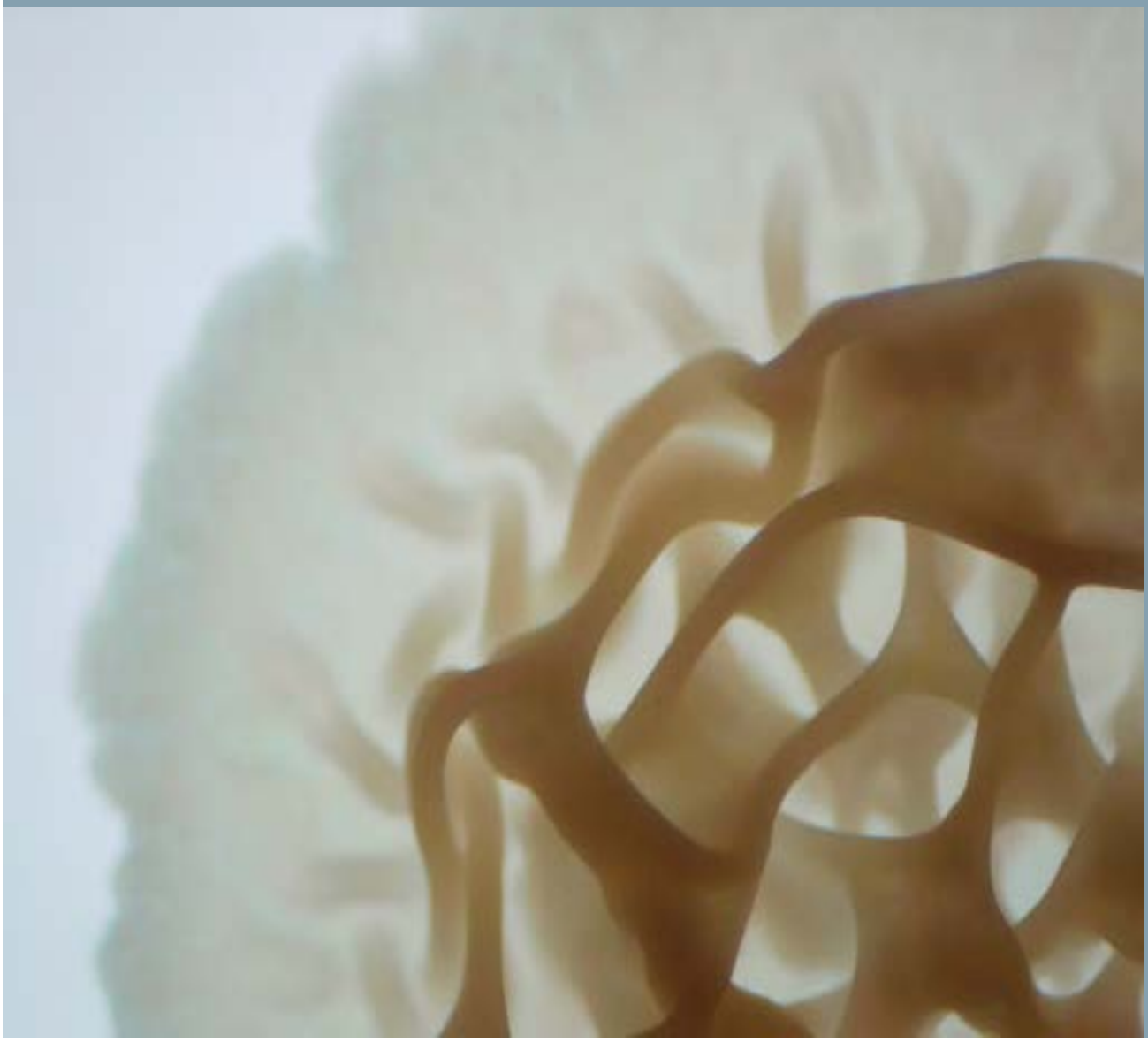
Penn State
Department of Plant Pathology Newsletter

2009-2010



The cover picture is of a colony of *Bacillus subtilis* (magnification 40X, grown on tryptic soy agar) isolated from *Chenopodium album* (lambsquarters). This striking *B. subtilis* was isolated as part of Anna Testen's master's project examining the use of Bacillus in sustainable production of *Chenopodium quinoa* (quinoa) in Bolivia and Ecuador. Bolivian and Ecuadorean Bacillus isolates from quinoa, along with domestic Bacillus isolates from lambsquarters, are assessed for ability to solubilize phosphate, colonize roots, and control disease in *C. quinoa.* Because *C. quinoa* is a crop grown almost exclusively in the Andean region, we use *C. album* (closely related to quinoa) to obtain domestic isolates of Bacillus for screening.

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Dedication

Dr. James F. Tammen, one of the founding members of the Department of Plant Pathology and its first head, passed away on July 27, 2010, at the age of 85. The Department of Plant Pathology expresses its deepest admiration and respect for Dr. Tammen. He will be lovingly remembered and deeply missed by his colleagues, alumni, and friends. We dedicate this newsletter to him.

Greetings from Happy Valley

Fred Gildow
Professor and Head, Department of Plant Pathology

Welcome to our 2010 Plant Pathology Newsletter. As I write this I am completing my second year as Department Head and it seems I just arrived and have a lot to learn. Last year I opened the newsletter highlighting that I was the tenth Department Head to follow in Jim Tammen's footsteps (Head from 1963-1976), and I made light of the fact that he frequently visited his Department to check up on me. Sadly, Jim passed away in July, 2010, and he has been missed at our various celebrations this past year. To honor Jim and his wife, Marilyn, for all they did to support Plant Pathology, the Department is developing the James F. and Marilyn L. Tammen Memorial Endowment for International Plant Pathology. We hope to build this endowment as a lasting memory of the Tammens and as a lasting statement to the quality of the department that Jim and his colleagues built. Please see the back pages of this Newsletter and consider making a donation in support of this worthy cause.

It has been a fast-paced year here in the Department with lots happening. In 2010 we graduated four M.S. students and two Ph.D.s. Similar to last year, we again had high success in recruiting new graduate students and all five of our first choice candidates selected Plant Pathology at PSU to begin their careers. Success in recruiting was aided by the Department's ranking in the top 10-25% of Plant Science graduate programs in the country based on a recently released study by the National Research Council. Among Plant Pathology programs we ranked in the top five. Quality of our graduate students was verified by four students winning awards for research at the University Graduate Exhibition and two awards at the College of Ag Sciences/Gamma Sigma Delta Research Expo. Three students were awarded highly competitive fellowships during the year and another was awarded a competitive grant for research. Seven students were awarded endowed scholarships for academic excellence in plant pathology and mushroom science.

Quality of our graduate program results from the high quality of our faculty who do such an excellent job teaching knowledge and mentoring research. Don Davis (Ph.D. 1970) was the 2010 recipient of the Outstanding Teaching Award in Plant Pathology, endowed by the family of Bill Merrill. Research excellence resulted in Pete Romaine's 2010 Outstanding Research Award by the Gamma Sigma Delta Honor Society for Agricultural Research. Rounding out our triumvirate of awards in all areas was Gary Moorman, who was awarded the Dean's Spirit of Extension Award for exceptional service. Just for the record, Gary has presented over 525 extension presentations since 1983 and only missed two scheduled meetings because the roads were closed. That kind of dedication deserves an award.

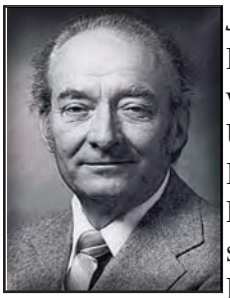
Our 2010 Outstanding Staff Award, endowed by Laurence and Mary Ann Moore, was earned by Becky Peplinski. Selection of Becky was unanimous and I believe everyone in the department has a story to tell about how Becky has helped them in a significant way. She functions as both our Chief Financial Officer and HR director. Becky definitely found the right job when she hired on as Jim Tammen's Administrative Assistant in 1971. Oh, and did I mention this year marks her 40'th anniversary at PSU and she is still irreplaceable. Speaking of long time colleagues, Leon Kneebone (Ph.D. 1950), of mushroom extension fame, celebrated his 90'th birthday in 2010 and recently attended our department award ceremony in March, 2011, accompanied by Professor Emeriti Jim Bloom and Herb Cole (Ph.D. 1957). This is such a great place to work, no one wants to leave!

The Department stayed busy all year with all sorts of organized activities. We started spring with Ag Day in April, which was an expo of agricultural disciplines and majors held on the HUB lawn for the entire University. The PPATH grad students prepared displays advertising the wonders of plant pathology and attracted a respectable amount of attention. May was an unusually busy month. Seogchan Kang and colleagues sponsored a national symposium on Oomycete Pathosystems supported by a USDA grant for Microbial Genomics and Plant Biosecurity. Not to be out done, on May 18-20, Sara May (M.Agr. 2003) and Beth Gugino (Ph.D. 2004) organized a Plant Disease Diagnostics Workshop sponsored by the USDA National Plant Diagnostic Network, with 48 participants from around the country. David Geiser, director of the Fusarium Research Center, followed this on May 21 with a Fusarium Basic Training Diagnostic Workshop. August saw intense Departmental activity at the annual American Phytopathological Society meeting in Charlotte, chaired by our own Barb Christ, the 2010 President of APS. Upon our return, faculty, students, and staff put in long hours at Ag Progress Days, held August 17-19, at the Rock Springs Research Farm, focused on plant pathology exhibits oriented to families and children, and research plots open to the public. The end of September we celebrated the 40th anniversary of the founding of the Fusarium Research Center with a dinner at the Penn Stater. Dr. T.A. Toussoun, one of the founding members of the FRC (along with Paul Nelson), was the guest speaker. We probably did a lot more this year, involving a lot more people, but I can't remember them all and I'm running out of space. You can find what I missed by reading the rest of the newsletter!

I would be remiss if I didn't mention something about the future. I suspect many of you have heard that the Penn State budget is in jeopardy from reductions in state allocations. The College has been planning all year for a variety of changes including reduced budgets, reduced staffing, and College restructuring. Regardless, I trust the College leadership will make the right decisions over the next year and we will come out of this stronger and better organized. I can assure you that the Plant Pathology Graduate Program will continue into the foreseeable future.

In Memory

June Bloom died June 20, 2010, at the Fairways of Brookline in State College. June graduated from the Clearfield Hospital Nursing Program and later received a B.S. in Nursing and Elementary Education from Penn State. She was the head pediatric nurse at the former Bellefonte Hospital at Willowbank, and more recently was an office nurse for several doctors in the State College area. June was a member of the Spring Creek Presbyterian Church and the Clearfield Nurses Alumni Association, and enjoyed quilting, sewing knitting, traveling, and R.V.ing. She is survived by her husband, Dr. James R. Bloom, Professor Emeritus of Plant Pathology, and their four children, James R. Bloom, Jr. (Ginger Greico), Heidi Weimer (Tom), Gretchen Rebarchak (Paul), and Coralie Bloom (Glenn Taylor), and four grandchildren.



John Samuel Boyle passed away at his home in State College, PA, on June 12, 2010. He was born on June 7, 1917, on a farm near Laverne, OK. He received his B.A. degree with a major in botany and minors in chemistry and zoology in 1939 from Wichita State University. In 1942, he received his M.S. degree in mycology from the University of Iowa, where he also served as executive director of the YMCA. He served in the U.S. Navy in World War II, beginning in 1942 as Pharmacist Mate 2nd Class and ending his service in 1945 as commanding officer of the hospital ship USS APL 58. He received his Ph.D. in plant pathology from the University of Wisconsin, Madison, in 1949. He joined the botany faculty of the then Pennsylvania State College as assistant professor of plant pathology in 1949, and retired from Penn State as emeritus professor in 1982. John was an expert on viral diseases of fruit and vegetable crops, who pioneered experimental work on the transmission of viruses from woody to herbaceous plants. He established the first formal course on plant virus diseases at Penn State, and his research focused on understanding and developing strategies for the control of plant virus diseases. From 1964-1965 Boyle was a Fulbright Lecturer at Assiut University in upper Egypt, in 1975 was a visiting Fulbright scholar at the Kinsealy Research Centre, Dublin, Ireland, and had foreign assignments in Sri Lanka and Uruguay. He is survived by his wife, Nellie, and two daughters, Elizabeth Boyle Taylor and Margaret Boyle White, and four grandchildren. Two sons, John David (1943) and Stephen Garrett (2007) preceded him in death.

James F. Tammen, born in Sacramento, CA, February 27, 1925, passed away on July 27, 2010, in State College, PA. Enlisting in the U.S. Army Air Corp in 1944, he flew 35 consecutive combat missions over Germany, earning an Air Medal, the Distinguished Flying Cross, 4 Oakleaf Clusters, a Presidential Unit Citation, and four Battle Stars. He earned his B.S. degree, with honors, from the University of California, Davis, in 1949 and his Ph.D. in Plant Pathology from the University of California, Berkeley, in 1954. Following a stint at the University of Florida he joined The Pennsylvania State University in 1956 as assistant professor of plant pathology in the then Department of Botany and Plant Pathology. In 1963, when the Department of Plant Pathology was created, separate from the Department of Botany, Jim was promoted by popular demand of the faculty to department head. In 1976 he was named Dean of the College of Agriculture, Institute of Agriculture, Forestry, and Home Economics, and Director of International Programs in Agriculture at the University of Minnesota. In 1981 Jim accepted the presidency of Oglevee Associates, Inc. While there he developed and patented a pathogen-free production system for lilies. After serving a term as Director for Technology Transfer at the Institute of Food and Ag Sciences at the University of Florida, Jim retired and returned to Penn State, remaining actively involved in the Department of Plant Pathology. In 2006, at the request of the faculty and by special action of the University, Jim was granted Professor Emeritus status. Jim received many awards, recognitions, and patents centered on his work, the development of pathogen-free production of carnations and geraniums, root disease control of poinsettias, chrysanthemum and Easter lily. A member of the American Phytopathological Society for over fifty years, he served as President in 1974-75 and was named an APS Fellow in 1984. Jim was predeceased by his wife, Marilyn, in 1995. He is survived by two daughters, Jeanne Arnold and Jan Menoher, and four grandchildren.

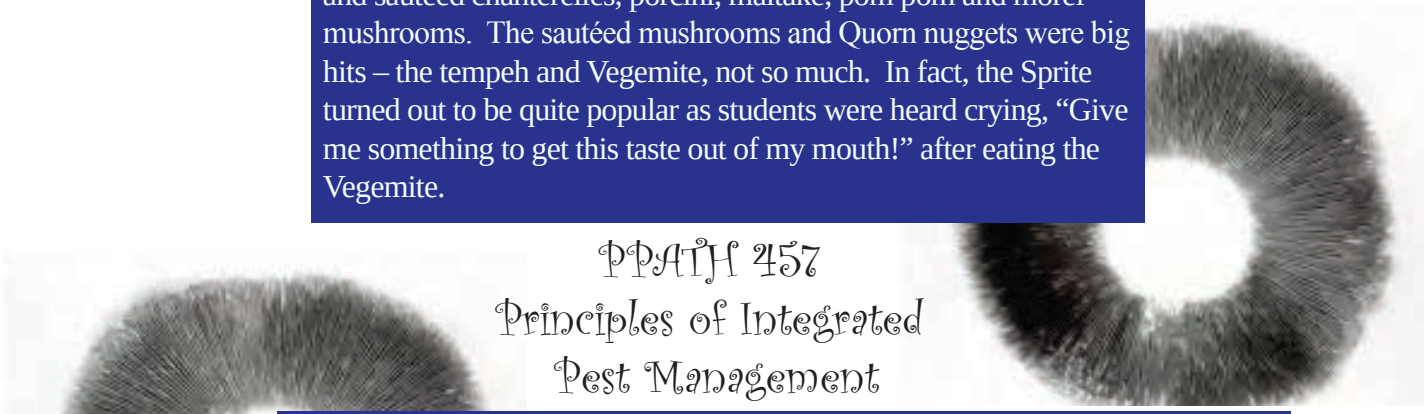
Undergraduate Education Spotlight

David Geiser

PPATH 120 The Fungal Jungle

Gretchen Kuldau

Gretchen Kuldau and David Geiser hosted a "Fungus Feast" as part of PPATH 120, "The Fungal Jungle." Students sampled a variety of exotic and not-so-exotic fungal foods, including Sprite soda (flavored with citric acid provided by *Aspergillus niger*) to Vegemite (yeast extract), Mexican black rice (black from the teliospores of *Ustilago maydis*), tempeh (soybeans "fermented" with Rhizopus), Quorn "Chik'n Nuggets" (made out of Fusarium) and sautéed chanterelles, porcini, maitake, pom pom and morel mushrooms. The sautéed mushrooms and Quorn nuggets were big hits – the tempeh and Vegemite, not so much. In fact, the Sprite turned out to be quite popular as students were heard crying, "Give me something to get this taste out of my mouth!" after eating the Vegemite.



PPATH 457 Principles of Integrated Pest Management

Paul Backman co-taught AGECO 457, Principles of Integrated Pest Management, with Ed Rajotte (Entomology) and Dave Mortensen (Crop and Soil Sciences). Students were given the unique opportunity to see the full process of commercial mushroom production at the Mushroom Test-Demonstration Facility, with a tour given by John Pecchia. John, and Dave Beyer as well, give these tours for a number of our undergraduate courses and they are always a big hit with our students.

AGECO 122

Scott Isard is having a lot of fun with his Agroecology course "The Atmospheric Environment: Growing in the Wind." AGECO 122, cross listed as Meteorology 122, was taught in a new format and attracted 26 undergraduate students from a wide array of majors. The general education course is geared to "non-science" students who want to learn about the effects of weather on plants and animals. One of goals of the course is to attract students into agriculture majors. Growing in the Wind is about how processes at the ground and in the air govern weather conditions on Earth. It focuses on five major weather elements: energy, temperature, moisture, pressure, and wind and how these factors influence ecosystems and habitation of our planet. Discussions about human impacts on weather and climate and current environmental issues involving the atmosphere generated a great deal of excitement in the Fall 2010 semester.

Scott Isard

Tim McNellis

AGECO 121

Phil Jensen

Tim McNellis included several plant pathology lab exercises as part of his Agroecology 121 course "Plant Stress: It's Not Easy Being Green." Students had an opportunity to inoculate various plant materials with *Erwinia amylovora*, *Erwinia chrysanthemi*, and *Pseudomonas fluorescens* in a host range experiment. In a virulence experiment, they measured the extent of tissue soft rot by different strains of *E. chrysanthemi* in potato tubers by scooping out the rotted areas and weighing the material. Although many students rated this lab as "extremely gross," they still seemed to be having fun. McNellis lab members Judy Sinn, Steve Lee, and Phil Jensen helped out with the labs. AGECO 121 is a general education course that fills up at 48 students every fall and has become quite popular among student athletes as a way to fulfill their science credit requirements.

Faculty News

Paul Backman continues to research biological control of plant pathogens and weeds, in the context of bio-intensive IPM. Paul has been actively pursuing endophytic microbes, primarily bacilli, for long-term residence in the internal tissues of plants, while simultaneously inducing the plant to defend itself by producing defense proteins. Much of his field evaluations are carried out in the Andean region of South America. Working with adjunct scientists in USDA, Dr. Bryan Bailey and **Dr. Rachel Melnick** (Ph.D. 2010), our trials in Ecuador have shown that bacilli can cause significant reductions in cacao diseases following colonization, and we are presently evaluating their potential in other perennial crops such as blackberries, tree tomatoes and naranjilla. Additionally, we are determining how multiple beneficials affect each other. For instance, how does a bacillus on the root co-exist with a phosphorus solubilizing bacteria, while still allowing (or not) an endophyte to protect the foliage? Do these beneficials have negative or positive consequences to rhizobia and endomycorrhizae? The dynamics of multiple beneficials are being examined on faba bean and quinoa with our partners in Bolivia (funded by USAID through their SANREM and IPM CRSPs). Research in Bolivia and Ecuador is supported by first-year graduate students **Anna Testen** and **Hilary Kessler**. Research conducted by recent graduate **Dr. Anissa Poleatewich** (Ph.D., 2010) found that bacteria found on abandoned orchard trees can protect harvest wounds in apples and extend storage time while reducing post harvest losses of apple. Currently she is continuing as a postdoctoral scholar with **Dr. Gildow**. Ph.D. candidate **Steve Conaway** is continuing his research in collaboration with USDA-ARS adjunct professor **Dana Berner**, and NRCS, and state departments of Agriculture and Transportation on the biological control of Canada thistle using the rust fungus *Puccinia punctiformis*, a project funded the USDA NRI. Interestingly, he has identified previously unknown, probable races of *P. punctiformis* that are infective only to certain biotypes of Canada thistle. Paul also continues to contribute to the Agroecology undergraduate curriculum teaching Integrated Pest Management (AGECO 457) and Senior Seminar (AGECO 490), as well as advising students and coordinating their internships and research experiences.

David Geiser had a big year, celebrating the Fusarium Research Center's 40th Anniversary – see the article on the history of the FRC for more information. He co-taught (with Gretchen Kuldau) a special discussion course for graduate students entitled "UG-99 and Green Revolution") where the threat of this new stem rust pathogen (see the description of Scott Isard's work) was interpreted in advances associated with the Green Revolution. It was an interesting and enlightening experience for everyone involved, and the instructors thought they learned more from the students than vice-versa! In the summer, he worked with **Grace O'Keefe** (she did the heavy lifting) on a molecular identification portion of the Plant Disease Diagnosis course (PPATH 502), giving students the opportunity to perform these methods just as they are done in APHIS diagnostics labs. This Fall he is making his first foray into undergraduate "General Education," teaching "The Fungal Jungle" (PPATH 120) in place of **Maria del Mar Jiménez-Gasco** and **Gretchen Kuldau**, an experience that every faculty member must have at some point. He is actually having a lot of fun teaching various theater and business majors about fungi! Research this year has concentrated heavily on the common fusaria that inhabit the indoors, that also act as human pathogens. Ph.D. student **Dylan Short** is deep in the data analysis phase of his project on environmental and pathogenic fusaria and nearing completion. Summer Astrobiology student **Lydia Clark** from Reed College, Academy of Applied Sciences Fellow **Elaine Kang** from State College High School (Seogchan Kang's daughter) and undergraduate **Jingchen "Dawn" Zhao** have worked on these fusaria both as indoor fungi and as agents causing eye infections.

Dr. Fred Gildow is maintaining his research program on vector transmission of plant viruses and his association with teaching PPATH 405 (Microbe-Plant Interactions and Plant Disease) while completing his second year as Department Head. After teaching PPATH 405 for 23 years, Fred reluctantly turned over primary teaching responsibilities for this fall semester course to **Dr. Anissa Poleatewich** (Ph.D. 2010). Fred still gave occasional lectures and poked his head in the door during laboratory sessions, just to feel in control and claim he is still teaching! Anissa assisted in teaching the course in 2009, and according to Dr. Gildow, she did an outstanding job and significantly improved the course. In August, **Dr. Kari Peter**, a postdoctoral scholar working in Fred's lab for the past two years accepted a position with the USDA in Beltsville, MD. Kari has been working on a project in collaboration with Fred and **Dr. Stewart Gray** (USDA-Cornell University) to identify aphid proteins associated with regulating plant virus transmission. Over the past year, she was instrumental in identifying potential host plant proteins that bind to viruses and influence the ability of aphids to transmit virus. This discovery was significant for understanding molecular regulation of virus transmission and opened a new area of research. **Bin Tian**, a third-year Ph.D. student in Fred's lab is currently working in collaboration with **Dr. Bill Schneider** (USDA-Foreign Disease Lab, Fredericks, MD) to identify mutations in legume-infecting luteoviruses that are associated with virus adaptations to new host plant species and to new aphid vectors. These luteoviruses infect perennial clover plants and have the potential to become epidemic in annual soybean crops with the recent introduction of the Asian soybean aphid that colonizes soybean. According to Fred, Bin's studies on microevolution of viruses adapting to new hosts and vectors is important for predicting how viruses adapt in a new geographical area or to a newly introduced crop species. All of the research described above depends on the efforts of **Bill Sackett**, Research Technologist, who works to maintain the aphid, plant, and virus resources needed for Dr. Gildow's lab. Although Bill officially retired on July 31, 2010, he doesn't realize it yet, as he continues to work part time assisting Fred with aphid rearing. Bill can be found many afternoons in Rm. 5 Buckhout chained to the ultramicrotome and thin-sectioning tissues for electron microscopy. Fred still does a little research when he has to and has reportedly been seen microinjecting psyllids with citrus greening bacteria at the USDA lab at Ft. Detrick and sitting in front of the EM in South Frear building. On a personal note, Fred's family now consists of three Penn State alumni including his wife, Viqui (B.S., Nursing), son, Nick (B.S., Mathematics), and his daughter, Marie, who graduated this spring (B.S., Environmental Systems Engineering). Fred's son, Doug, is working on his Ph.D. at Princeton University, but in spite of his choice of schools is still welcomed home.

Beth Gugino (Ph. D. 2004) continued to build her vegetable extension/research program during 2010. In May, she worked with **Sara May** (M.Agr. 2003) hosting the very successful NPDN/PSU Plant Disease Diagnostician Workshop (see for more information). As usual, field season was a busy time of year but thanks to hot dry weather it was a less eventful disease year for PA vegetable growers. In the fall she welcomed **Emily Pfeufer** (M.S. 2010) to her program. As a Ph.D. student, Emily will continue work initiated in the Gugino lab by Beth and **Michele Mansfield** (Ph.D. 2005) to address onion bacterial disease problems that continue to plague vegetable growers in Pennsylvania. Thanks to funding from the NE-IPM Partnership program, this research has now been expanded to include New York in collaboration with Christy Hoepting, Cornell Cooperative Extension. 2010 also saw the conclusion of one NE-SARE Professional Development train-the-trainer project focusing on nematode identification, assessment and management and the start of a new one in collaboration with colleagues (con.)nell and the Connecticut Agricultural Experiment Station, this time addressing the management of soil-borne pathogens in vegetable production systems in the Northeast. This year she served out her term as Secretary-Treasurer for the Northeast Division of APS and now is the current Vice

President as well as Chair of the APS Extension Committee. In addition she continues to serve as the Horticulture Natural Working Group co-chair and Vegetable and Small Fruit Program Team co-leader at Cornell and the Connecticut Agricultural Experiment Station, this time addressing the management of soil-borne pathogens in vegetable production systems in the Northeast. This year she served out her term as Secretary-Treasurer for the Northeast Division of APS and now is the current Vice President as well as Chair of the APS Extension Committee. In addition she continues to serve as the Horticulture Natural Work Group co-chair and Vegetable and Small Fruit Program Team co-leader.

John Halbrendt: After three consecutive years of negative data, the Plum Pox Virus (PPV) eradication program was declared a success on October 29, 2009 by the USDA/APHIS and the Pennsylvania Department of Agriculture. Nevertheless, an ongoing monitoring program was considered necessary to provide additional assurance that the virus had not escaped detection. My lab has been assisting PDA with the PPV monitoring program. In 2010 a total of 75,769 samples were processed and all tested negative for PPV. A collaborative project with Dr. Zongrang Liu of the USDA/ARS resulted in the development of a novel RT-PCR technique that used Tomato Ring Spot Virus (ToRSV) primers designed within the highly conserved 3' UTR region. This test was more sensitive at detecting ToRSV than a previously reported RT-PCR assay based on U1/D1 primers and potentially could serve as a practical tool for the detection of the virus. My research with Dr. G. Krawczyk on the use of entomopathogenic nematodes to control wood boring insects is also making good progress. We have determined that the efficacy of these nematodes to find and kill borers can be greatly enhanced by applying them to the tree in a slurry mixture that retains moisture. The nematodes are sensitive to desiccation and the slurry mix increases the chances that they can find and enter a borer gallery before dying.

Scott Isard continues to lead a team of scientists preparing for the incursion of new wheat stem rust races into the U.S. The first of these new races was discovered in Uganda in 1999 and additional races have been identified in eastern Africa, and this year in southern Africa. Fortunately this race complex, commonly called Ug99, has spread slowly in Africa and the Middle East. For example, Ug99 was reported in Iran during 2007; however, so far there are no reports of the new pathogens being found further east in Asia. Nevertheless, the potential exists for Ug99 to enter the U.S. at anytime. The pathogen can be blown long distances and there is considerable likelihood of inadvertent human-mediated spread. For example, telia of the new wheat stem rust races could enter our country in straw packing material associated with handcrafts imported from Africa and Asia. Most U.S. wheat and barley cultivars are susceptible to Ug99. The development of resistant cultivars is receiving a tremendous amount of attention in our country and worldwide, but even so, the deployment of high-yielding resistant cultivars will likely require 7-10 years. Until then the first line of defense will be fungicide applications. The goal of Scott's nationwide team of scientists is to develop research, extension, and education components of an IPM program to provide growers with efficient in-season stem rust management to protect their crop yields and profits between the time Ug99 enters the U.S. and deployment of cultivars with durable long-term resistance to this pathogen. Hopefully we will not find ourselves in this situation. The team has recently developed PCR diagnostic tools for identifying the new Ug99 races and is now testing this tool with the National Plant Diagnostic Network. We are also beefing up to monitor for wheat rusts in North America, developing aerobiological models to forecast risk from wheat rust movement, and deploying Information Technology tools to rapidly share information among stakeholders.

Maria del Mar Jiménez-Gasco taught once again PPATH 505, Fundamental of Phytopathology, during spring of 2010. Maria also had a baby girl during the summer, and her name is Maria del Mar too! Consequently, **David Geiser** had all the fun teaching "The Fungal Jungle" during fall of 2010. Postdoctoral researcher **Glenna Malcolm** continued to work on *Verticillium dahliae* research and presented her exciting results at the annual meeting of the Ecological Society of America Annual Meeting. She reported how this important plant pathogen is found invading the stem cortex of what have been traditionally considered to be non-hosts of this fungus. Graduate students **Jill Demers** and **Lili Zhang** (M.S. 2010) presented their research at the Gamma Sigma Delta Student Research Exhibition and the PSU Graduate Exhibition. They both did a great job, and Lili was 1st place winner in the Health and Life Science category for her work on the evolution of populations of *Venturia inaequalis* during apple scab epidemics; it was very exciting! Lili successfully defended her Master's Thesis and graduated in fall 2010. **Ponusa Songtipya** graduated in spring 2010 after working on developing exciting new materials with antifungal activity. She is now Assistant Professor at Prince of Songkla University, Thailand. Once again our lab has been very lucky to have several undergraduate students helping and learning about research on various aspects of fungal biology: **Sarah Colihan**, **Jessica Krocker**, **Stephanie Metis**, **Megan Reith** (WISER program), and **Esther Shin**. Esther presented her research at the 2010 PSU Undergraduate Exhibition. We were very proud of her!

Seogchan Kang organized a mini-symposium titled "Challenges in Understanding and Managing Oomycetes" in May 2010. Eight outside speakers visited the Department and presented talks in areas such as identification and classification of Oomycetes, tracking pathogen population using genomics data and tools, diagnostic tool development, disease management, and extension and educational needs and opportunities. He and several CoPIs launched a new Ph.D. training program titled "Genomics and Informatics of Agriculturally Important Microbes." The funding for this program came from the USDA-AFRI Microbial Functional Genomics Program and matching funds from the Huck Institute, College of Agricultural Sciences, and departments of Plant Pathology, Food Science, and Biology. Eleven students from multiple graduate programs were selected to jump start the program. **Dr. Yongkeun Yi**, Professor of Plant Pathology at Andong National University in Korea, started a one-year sabbatical in January 2010. **Jaeyoung Choi**, a Ph.D. candidate at Seoul National University, visited the lab for three months and conducted collaborative research between his advisor **Yong-Hwan Lee** and S. Kang. Two informatics platforms supporting pathogen identification (*Phytophthora* Database at www.phytophthoradb.org, and Fusarium Database at www.fusariumdb.org) have been updated with new data and tools and have several hundred registered users from ~50 countries around the world. Ph.D. student **Bongsoo Park** (Bioinformatics & Genomics) received a travel award from the NSF-sponsored Oomycete Molecular Genetics Network (OMGN) and made a presentation during the 2010 OMGN meeting in Toulouse, France. Ph.D. student **Vasileios Bitas** (Plant Pathology) received a number of awards in 2010, including (i) 2nd place poster presentation in the Gamma Sigma Delta 16th Annual Research exhibition, (ii) 1st place poster presentation in the 13th Annual Environmental Chemistry Student Symposium, (iii) 2nd place in the 25th Annual Graduate Student Exhibition Poster and Visual Arts Options, and (iv) 2010 L. Earl & Veronica Casida Graduate Scholarship in Plant Pathology. Vasileios was also chosen as one of the student representatives of the Penn State Chemical Ecology group and visited the Max Planck Institute of Chemical Ecology in Jena, Germany. **Venky Moktali** (BioInformatics & Genomics) spent three months at Seoul National University in Korea. Postdoc **Hye Seon Kim** visited the laboratory of Kirk Czymmek at University of Delaware for one month to carry out a collaborative project between K. Czymmek and S. Kang.

Gretchen Kuldau is now Option Director for the Intercollege Masters of Professional Studies in the Homeland Security Agricultural Biosecurity option. See the article on the iMPS-HLS for more details. As part of this program she instructed the online course entitled "Agricultural Biosecurity: Protecting a Key Infrastructure" in the spring and the fall. The adult students in this course are dedicated and bring interesting life and professional experiences to their work. In the lab Ph.D. student **Li Guo** and his wife Masters student **Lili Zhang** (Jimenez-Gasco group) are proud parents of Deborah Guo, born in early May. In May we also bid farewell to undergraduate **Adam Blatt** who worked with us for three years on a variety of lab and field projects. We wish Adam the best as he pursues his interest in becoming a physician researcher, and we keep encouraging him to go into medical mycology! On the research front, **Nancy Wenner** (M.S. 1987) is carrying on the analysis of deoxynivalenol in wheat and has completed two data sets that are part of a collaborative effort with Frances Trail at Michigan State University. **Li Guo** is continuing his molecular genetic analysis of *Fusarium verticillioides* genes involved in virulence and pathogenicity on maize.

Gary Moorman's graduate student, **Maria Burgos**, successfully completed her comprehensive exam and is working hard on her research to characterize the bacterial communities in irrigation water that may be suppressing *Pythium* naturally. Gary and Maria have received funding for the work in conjunction with several researchers at Virginia Tech who will be doing similar work with *Phytophthora*. Maria applied for and received a very substantial A. P. Sloane Foundation grant to assist her in completing her Ph.D. work. Gary continues to work on elm yellows but the outlook for the campus trees is bleak due to a combination of numerous trees succumbing to elm yellows in 2010 and the huge influx of Dutch elm disease-carrying bark beetles this summer. On the home front, Fran is retiring her garden services business after 10 years but is looking forward to spending more time in her own garden. Sara is teaching sociology to about half the varsity athletes at Boston College and Nathan is learning the ins and outs of automotive technology at Penn Tech in Williamsport (a Penn State campus).

Pete Romaine, research associate **Carl Schlagnhaufer**, and chemical engineering honors program undergraduates **Benjamin Woolston** and **Emily Dong** worked together on a DOD-DARPA project in which the cultivated mushroom, *Agaricus bisporus*, is being developed as a system for the mass manufacture of human therapeutic proteins and industrial enzymes. During the course of this research, Pete's lab discovered a previously unreported phenomenon involving long-distance movement of protein during mushroom development and successfully utilized it to achieve high-yield recombinant protein production. Large-scale production of an industrial enzyme using the using the mushroom system is now underway at a Pennsylvania-based company. Pete was an invited speaker at the Cambridge Health Institute 9th Annual PepTalk Conference held in San Diego, where he lectured on "Shedding Light on a Mushroom-based Protein Expression System". On the extension front, he continued to work closely with the Pennsylvania mushroom growers through his participation in the 52nd Annual Penn State Mushroom Industry Conference and a series of specialized grower meetings. He was also the organizing chair for PPATH 590 - Colloquium, the departmental seminar series.

Dan Royse is conducting research and working with growers to improve sustainable production efficiency of mushrooms. Dan welcomed a new M.S. student, **Shanece Baptiste**, to his research program in mid-August. Shanece graduated from the University of Georgia with a B.S. in biology and will be working on carbohydrate metabolism of *Agaricus bisporus*. M.S. student Stephanie Loehr is nearing completion of her work on minimally composted substrate for the production of *A. bisporus*. **Chenyang Huang**, a visiting scholar from the Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences (CAAS), Beijing, completed his work in Dan's work in Dan's lab on a joint Ph.D. degree with CAAS. He conducted research on the king oyster mushroom, *Pleurotus eryngii*. This past year, **Amber Slater**, a former undergraduate student in the Schyreyer Honors College, completed her honors thesis in the area of non-composted substrate for mushroom production.

Wakar Uddin is a Professor in Plant Pathology with specialty in turfgrass disease research and teaching. Wakar's research program entails epidemiology and management of gray leaf spot (blast diseases) of perennial ryegrass turf, and population biology of *Magnaporethe oryzae* from various gramineous hosts. Wakar also maintains an outreach program providing diagnoses of turfgrass disease problems and management recommendations to turfgrass industry clientele in Pennsylvania. Wakar's international activities include collaborative research at University of Bangalore, India, and Universidade Federal de Viçosa, Brazil. Wakar teaches three courses in turfgrass disease diagnosis and management, including an online course at Penn State World Campus. **Alamgir Rahman** and **Yinfei Li** are Ph.D. candidates in the turfgrass disease research program, and Brian Ayrnardi is the assistant in laboratory and field research. The turfgrass disease research program maintains two laboratories, 58,000 ft turf research plots, and three outdoor humidity/mist chambers (1500 ft each) at the Joseph Valentine Turfgrass Research Center. The turfgrass disease program is part of the Center for Turfgrass Science and the World Campus Distance Education Program at Penn State.

Yinong Yang taught PPATH 543, Pathogen Variation and Host Resistance, in the spring of 2010 (the course was previously taught by Barb Christ). This course introduces current concepts of the host-pathogen interaction, with an emphasis on understanding the genetic, molecular and biochemical mechanisms of pathogen virulence and host resistance. Dr. Yang's research program focuses on signal perception and transduction of rice disease resistance and drought tolerance, which has been supported by the U.S. Department of Agriculture (USDA) and National Science Foundation (NSF) Plant Genome Program. Recently, his lab has identified and characterized a number of important fungal effectors and host interacting factors as well as novel signaling mechanisms involved in rice disease resistance and drought tolerance. He is currently working with three Ph.D. students (**Wenhua Liu**, **Emily E. Helliwell**, and **Yueying Chen**), one postdoctoral research associate (**Dr. Kabin Xie**) and a senior research technologist (**Qin Wang**). In addition, **Dr. Junhua Zhang**, a visiting scientist from Northeast Agricultural University in China, successfully completed his one-year study on mechanisms of rice sheath blight resistance and received an award of appreciation from USDA. During the past year, Dr. Yang served as the Chair of the Biotechnology Committee and helped moderate a technical session in the annual APS meeting in Charlotte, NC. He also gave invited presentations in the Department of Botany and Plant Pathology at Purdue University, Plant and Animal Genome XVIII Conference in San Diego, and the 5th International Rice Blast Conference in Little Rock.

Adjunct Faculty

Dr. Gloria Abad has been appointed as Adjunct Assistant Professor in the Department of Plant Pathology. Dr. Abad currently is Acting Director of the USDA-APHIS Molecular Diagnostics Lab in Beltsville, Maryland. Dr. Abad is an expert in Phytophthora and Pythium identification and has organized and led several successful international workshops on fungal identification. She also collaborates with scientists in Latin America on Oomycete isolations and identifications. Currently, she is working with Dr. Kang on the Phytophthora and Pythium databases and plans to participate in graduate teaching through guest lectures, seminars, and workshops.

Retirement

Bill Sackett retired from his position of Research Support Technologist on July 31, 2010, culminating 21 years of service to Penn State and the Department of Plant Pathology. Bill first joined the department in 1989, working with **Felix Lukezic** (Professor Emeritus of Plant Pathology) and the late **Roslyn Levine**, on bacterial diseases and biological control. In 1996, he joined **Fred Gildow**'s research program in plant virology. Bill became an expert in virus purification and electron microscopy techniques in support of Fred's program. He also became an expert on aphid vectors of plant viruses with primary responsibility for maintaining an aphid zoo of over a dozen species of aphids. Over the years, Bill helped many students from several departments to complete their thesis research. A retirement celebration in his honor was held in September 2010. The department joined Fred and Felix in congratulating Bill for his contributions to their research programs, as well as his service to the department and his assistance in teaching PPATH 405 each fall.

Fred Gildow, Bill Sackett, and Felix Lukezic

History of the Department of Plant Pathology

Plant Pathology Faculty 1971

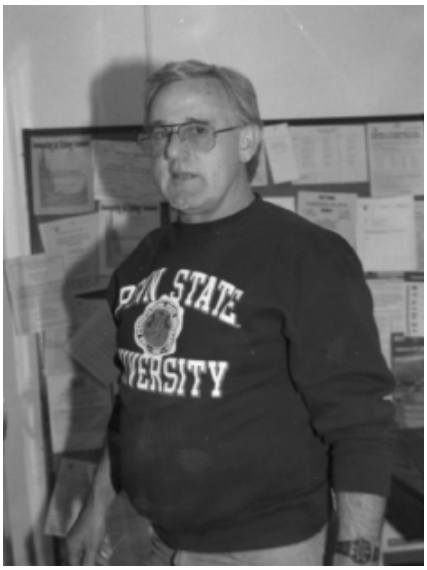
Front Row (l-r): J. R. Bloom, P. J. Wuest, R. R. Nelson, S. H. Smith, T. A. Toussoun, R. A. Hyre
2nd Row (l-r): L. R. Kneebone, J. S. Boyle, R. F. Stouffer, W. R. Mills, R. A. Krause, L. P. Nichols
Standing (l-r): W. Merrill, Jr., K. T. Leath, J. F. Tammen, L. C. Schisler, F. L. Lukezic, P. E. Nelson

Plant Pathology Faculty 1996

Front Row (l-r): P. J. Wuest, G. W. Moorman, F. E. Gildow, B. J. Christ, E. J. Pell
2nd Row (l-r): J. E. Ayers, D. M. Beyer, S. P. Pennypacker, N. G. Wenner, E. L. Stewart, J. S. Boyle
3rd Row (l-r): F. L. Lukezic, J. P. Sinn, W. K. Hock, J. M. Skelly, D. J. Royse

History

Plant Pathology



Bill Brown (Brownie)

James Sinden, Frank Kern

John Skelly and Leonard Francl, 2003

Dan Royse, Alan MacNab, John Skelly, Don Davis, 2003

Intercollege Masters of Professional Studies in Homeland Security Agricultural Biosecurity Option

The Penn State World Campus launched the Intercollege Masters of Professional Studies in Homeland Security (iMPS-HLS) in early spring 2010. The program includes four options and the base program. Gretchen Kuldau was named Option Director for the Agricultural Biosecurity option within the degree. Faculty in Food Science and Veterinary and Biomedical Science also participate in the program. Applications to the program and inquiries are processed through the Plant Pathology Department with Lori Long as the staff support. Two of the four core courses for the option will be coming from Plant Pathology. The Agricultural Biosecurity course developed and taught by Gretchen Kuldau is the lead in to the other three core courses, including a case study-based course on emerging plant diseases that will be developed by a team in Plant Pathology. The four core courses can be taken to earn a graduate certificate in Agricultural Biosecurity.

Kneebone Library

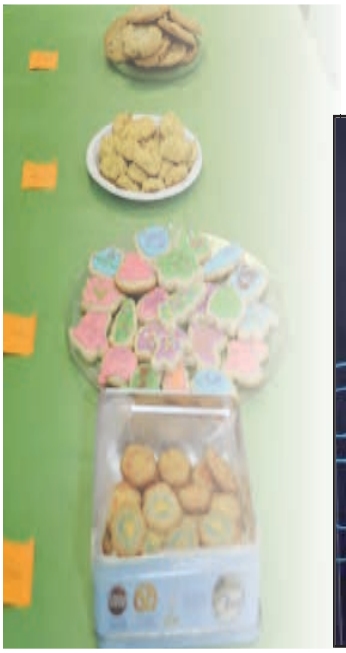
Dr. Leon Kneebone, Professor Emeritus of Botany and Plant Pathology, celebrated his 90th birthday on May 29, 2010. Dr. Kneebone directed a world-renowned mushroom research program, and directed the Mushroom Research Center at Penn State. He also initiated the annual Penn State Mushroom Short Course in 1956, which is still going strong to this day. After Dr. Kneebone retired in 1978, he donated his private library to the Penn State University Libraries. Not only is the collection of books, dissertations and reprints among the best mycological libraries in the world, the collection also includes a variety of artwork and fascinating examples of everyday mushroom-themed objects. Check it out the next time you're in the Paterno wing!

Delegates to the Symposium on the Cultivated Mushroom
VI th International Congress on Mushroom Science
Wageningen and Amsterdam, The Netherlands, 1965
Leon R. Kneebone, President, 1962-1965

Department Event Photos

Welcome Brunch Fall 2010

International Potluck Spring 2010



Cookie Competition 2010

Holiday Party 2010 Hilton Garden Inn

PPath Picnic
Summer 2010
Larson Research Center

Babies of Buckhout

Deborah Yurou Guo
Born 7 May 2010
6lbs. 3 oz.
Happy Parents
Lili Zhang & Li Guo

Maria del Mar Manias
Born 4 June 2010 7 lbs 14 oz
Happy Parents
Maria del Mar Jimenez-Gasco
& Evangelos Manias
Big Brother Dimitrios Manias

Lucretia (Lucy) Ann Geiser
Born 29 Nov 2010, 7 lbs 3 oz
Happy Parents
Sarah Rich & David Geiser
& Big Brother "Dash"

Ella Marie Moore
Born 28 September 2010, 7 lbs 9 oz
Happy Parents
Chad & Jennifer Moore

Akshat Bachan
Born 12 April 2010
7 lbs 3.5 oz
Happy Parents
Dharmendra & Pratibha Singh

Wyatt James Kasson
Born 25 August 2010 7 lbs 14 oz
Happy Parents
Matthew & Lindsay Kasson

Visiting Scholars

Dr. Youngkeun Yi, Professor, Andong National University, Korea, visited **Dr. Seogchan Kang's** program from January 2010 through February 2011 to study molecular characterization of bacterial pathogen populations that affect vegetables.

Jaeyoung Choi, Ph.D. candidate in the Interdisciplinary Program in Agricultural Biotechnology at Seoul National University, Korea, visited **Dr. Seogchan Kang's** program from August-November, 2010, to work on the improvement of pathogen databases and associated IT tools.

Chenyang Huang, Ph.D. candidate in the Institute of Agricultural Resources & Regional Planning, Chinese Academy of Agricultural Sciences, Beijing, visited **Dr. Daniel J. Royse's** program from April 2009-March 2010, to receive training in mushroom genetics.

Dr. Mahendran Peyandi Paraman, Associate Professor of Soil Science and Agricultural Chemistry at the Agricultural College and Research Institute in Madurai, India, visited **Dr. Wakar Uddin's** program in March 2010 for training in soil silicon research methodologies for induced systemic resistance in plants.

Congratulations 2010 Graduates

Sarah Bardsley – M.S. - Plant Pathology – **Henry Ngugi**, advisor – Fall 2010
Thesis Title: S*tudies on the Epidemiology and Management of Bacterial Spot of Peach and Nectarine in Pennsylvania*

Stephanie M. Loehr – M.S. - Plant Pathology – **Daniel Royse**, advisor – Fall 2010
Thesis Title: *Minimally Composted Substrate for the Production of Agaricus bisporus*

Rachel L. Melnick – Ph.D. - Plant Pathology – **Paul Backman**, advisor – Spring 2010
Thesis Title: *Endophytic Bacillus spp. of Theobroma cacao: Ecology and Potential for Biological Control of Cacao Diseases*

Emily E. Pfeufer – M.S. - Plant Pathology – **Henry Ngugi**, advisor – Summer 2010
Thesis Title: *Status of Resistance to Sterol-demethylation Inhibiting Fungicides in Populations of Venturia inaequalis from Pennsylvania Apple Orchards*

Anissa M. Poleatewich - Ph.D. - Plant Pathology – **Paul Backman**, advisor - Summer 2010
Thesis Title: *Development of Biological Control Strategies for Integrated Management of Pre- and Postharvest Diseases of Apple in Pennsylvania*

Lili Zhang – M.S. - Plant Pathology – **Maria del Mar Jimenez Gasco**, advisor – Fall 2010
Thesis Title: *Genetic Diversity and Temporal Dynamics of Venturia inaequalis Populations following Two Apple Scab Epidemics in Pennsylvania*

2009-2010 Awards and Honors

Excellence in Teaching Award

The Excellence in Teaching Award recognizes outstanding teaching by a faculty member in the Department of Plant Pathology. The award was made possible through an endowment established by Mary Lou Merrill in memory of her husband, Dr. William Merrill, Jr., who served on the Plant Pathology faculty from 1965-to 1999. The 2009-10 recipient was Dr. Donald D. Davis.

Laurence D. and Mary Ann Moore Faculty and Staff Award in Plant Pathology

This award was established by Laurence D. Moore (Ph.D. 1965) and his wife, Mary Ann, to honor and recognize achievements by a faculty or staff member in the Department of Plant Pathology. The 2009-10 recipient was Becky Peplinski.

2009 Service Awards

5-Year Award	10-Year Award	15-Year Award
Debra Clemmer	Timothy McNellis	Timothy Grove
Scott Isard		Douglas Keith
20-Year Award	**25-Year Award**	
William Sackett	Barbara Christ	
Judith Sinn		
Rita Smith		

Faculty and Staff Awards and Honors

Penn State Cooperative Extension Director's Spirit Award for Outstanding Faculty	USDA Group Honor Award for Excellence, Pa. Plum Pox Eradication Project Team
Gary W. Moorman	Fred Gildow, John Halbrendt, William Kleiner, James Travis
Penn State Women in Science and Engineering (WISE) Faculty Recognition Award	**2010 North American Colleges and Teachers of Agriculture (NACTA) Award for Merit**
Barbara Christ	Maria del Mar Jimenez Gasco

Graduate Scholarship Awards

L. Earl and Veronica G. Casida Graduate Scholarship	Arthur Gaspari Memorial Scholarship
Jill Demers	Stephanie Loehr
Lester P. Nichols Memorial Award	**Henry W. Popp Award**
Maria Velez-Climent	Padmini Herath Emily Helliwell Rachel Melnick Anissa Poleatewich
James P. Roberts Scholarship	**Graduate Student Travel Awards**
Stephanie Loehr	Li Guo Maria Velez-Climent

Graduate Awards Honors

Graduate Student Awards and Honors

2010 Gamma Sigma Delta Research Exhibition	Award
Vasileios Bitas	2nd Place, Graduate Biological Sciences Division
Emily Pfeufer	4th Place, Graduate Biological Sciences Division
25Th Penn State Graduate Exhibition, 2010	
Vasileios Bitas	2nd Place, Health and Life Sciences Division
Steven Lee	1st Place, Health and Life Sciences Division
Maria Velez-Climent	3rd Place, Health and Life Sciences Division
Lili Zhang	1st Place, Health and Life Sciences Division
American Phytopathological Society	
Matthew Kasson	Potomac Division Meeting, 1st Place Graduate Student Research Award, Oral Presentation
Maria Velez-Climent	2010 National Meeting, APS Art in Phytopathology Contest, Microscopy Category, 1st Place and 3rd Place
13th Annual Penn State Environmental Chemistry Student Symposium	
Vasileios Bitas	1st Place, poster presentation
Alfred P. Sloan Scholarship	
Maria Velez-Climent	
Penn State Women in the Sciences and Engineering Institute (WISE) Travel Award	
Maria Velez-Climent	
President's Volunteer Service Award	
Sarah Bardsley	Gold Level Award
College of Agricultural Sciences Graduate Student Competitive Grant Award	
Bin Tian	

B. Christ 25 - Year Award

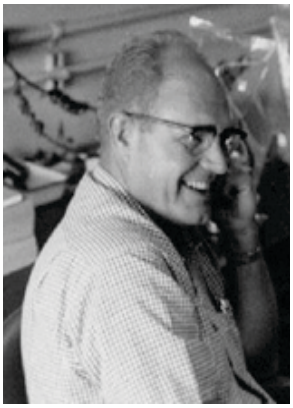
Fusarium Research Center

The Fusarium Research Center at Penn State: 40 Years of Research, Instruction and Service

David M. Geiser, Ph.D., Professor, and Director, Fusarium Research Center

Origins of the Fusarium Research Center

2010 marked the 40th anniversary of the founding of the Penn State Fusarium Research Center, better known locally as the FRC. A lot of the credit for the establishment of the FRC goes to James F. Tammen. Tammen was a world expert on diseases of floricultural crops, but we in the Fusarium world count him as one of our own—his dissertation research was on Fusarium and his first refereed paper was entitled "Pathogenicity of *Fusarium roseum* to carnation and wheat." After Tammen assumed the position as Head of the new Department of Plant Pathology in 1963, he oversaw a significant expansion in departmental personnel and resources. One of his prize accomplishments was the recruitment of distinguished faculty, among them Paul E. Nelson in 1965. During a sabbatical leave at Berkeley, Nelson developed a decades-long collaboration with T. A. Toussoun, who subsequently moved to Penn State to facilitate their research collaborations. By June of 1970, Nelson and Toussoun had developed a proposal for the Fusarium Research Center, which Tammen delivered to the Dean of the College of Agriculture, R. E. Larson, on July 1. Larson replied on August 21, offering his approval for the initiation of the Fusarium Research Center.



Missions of the Fusarium Research Center

Research: Initial plans for the FRC were oriented almost solely toward research. The research foci expanded greatly from plant pathology, encompassing the full spectrum of impact of the organism, including ecology, toxin production, and infections of humans and animals. We continue to focus on the organism and everything it does to this day.

Service: Certainly the greatest and most visionary aspect of the FRC was the establishment and expansion of the FRC culture collection. By 1996, the number of accessions had increased to over 15,000. This carefully curated collection includes fusaria from an extremely broad array of substrates (everything from plants to humans to animals to soil to manmade surfaces) and geographic locations (over 100 countries and every continent but Antarctica)! Under the daily vigilant supervision of Jean Juba, the Fusarium Culture Collection now numbers over 20,000 accessions and is growing.

Instruction: One of the most influential missions of the FRC was established with the initiation of Fusarium Laboratory Workshops, the first of which was offered at the University of Minnesota in 1979. These workshops brought a team of Fusarium experts along with a set of representative cultures together, and provided participants with an opportunity to spend a full week doing nothing but study Fusarium. The focus was on manipulation, identification, and taxonomy. The Fusarium Laboratory Workshops are now offered annually at locations around the world, organized by John Leslie at Kansas State.

Changes

Today we have two major tools that Toussoun and Nelson did not have available to them, DNA sequencing and the internet. After coming to Penn State in 1998 to assume the directorship of the FRC, I joined in a collaboration with Dr. Kerry O'Donnell at the USDA/ARS lab in Peoria, IL, who had started development of a molecular systematic dataset for Fusarium. This is now one of the largest such data sets for any organism. We wanted to make this data set of DNA sequences available to the public for genomic studies. Our colleague, Seogchan Kang, came to the rescue and his lab group developed internet-accessible pathogen databases, including http://www.fusariumdb.org/) that allows anyone around the world to identify Fusarium using basic DNA sequence data. The FRC is transitioning from a Fusarium culture collection accessible to relatively few to a scientific resource accessible to everyone in the world.

Anniversary Celebration

T. A. Toussoun, Barb Christ, David Geiser, Jean Juba, Nancy Fisher Gregory

Anniversay Cake

Challenges of the Future

Things are moving quickly. We now have a collection of over 20,000 accessions of different Fusarium isolates from around the world and large quantities of DNA sequence data—you could call them "barcodes" –on thousands of fusaria. Generating the data is fairly easy and cheap. In fact, there is so much of it that managing the data and making it available to everyone in the world is now a big challenge. We continue in our commitment to lead the way in these areas, with the goal of making available to everyone in the world the same analytical tools and data that we have at the FRC. Early on, Toussoun and Nelson realized that the key resource of the Penn State Fusarium Research Center was the culture collection, and DNA and the internet will not change that. Ultimately, it is the Fusarium that is our focus, and maintaining the culture collection may be our greatest challenge.

2010 Professional Activities

NPDN/PSU Plant Disease Diagnostics Workshop

Diagnosticians from around the country participated in a two-day basic diagnostics technique workshop and a one-day Fusarium basics training held at Penn State in the Department of Plant Pathology at University Park on May 18-20, 2010. **Sara May** and **Beth Gugino** coordinated the workshop, with assistance from the NPDN Diagnostics Program Area Committee. Forty-eight individuals participated in the basic techniques training and 45 attended the Fusarium basics training. **Barb Christ** and **Fred Gildow** opened the workshop with a welcome to the group, which was followed by a two-day basic techniques program that included sessions on identification of fungi (**Elwin Stewart**, Penn State and Grace O'Keefe, USDA-APHIS), bacteria (Karen Rane, University of Maryland), nematodes (**Beth Gugino** and **John Halbrendt**, Penn State), insects (Amanda Hodges, University of Florida), and viruses (Ruth Welliver, PA Department of Agriculture), as well as on basic methods (Rob Wick, University of Massachusetts) and abiotic disorders (Gail Ruhl, Purdue University). The group toured the Penn State campus with **Gary Moorman** (Penn State) to view disease and insect problems and to see the mature American elm trees. They also visited Penn State's 2000-acre Russell E. Larson Agricultural Research Center and toured the Pasto Agricultural Museum. A roundtable at the end of the basic techniques training gave the group an opportunity to discuss and share diagnostic tips and techniques. **David Geiser** and **Jean Juba** (Penn State) coordinated the Fusarium basic training. Participants learned basic culturing and identification techniques, looked at 19 different Fusarium species that diagnosticians may encounter in their clinics, and learned about and discussed mycotoxins and their identification from **Gretchen Kuldau** (Penn State).

NPDN/PSU Plant Disease Diagnostics Workshop participants

2010 Ag Progress Days

Our Ag Progress Days exhibit once again was an outstanding success! The exhibit this year included the ever popular mushroom display where both young and old could see and learn about different types of mushrooms as well as view samples of corn smut, tar spot, powdery mildew, rust and black knot through the microscopes and with hand lenses. Visitors could test their knowledge of plant diseases playing the matching game. If you could identify the plant then you were half way there! New to the display this year, visitors had to "Guess which of the following products were made using microorganisms?" The products included soy sauce, beer, blue cheese, bread, miso soup as well as organic tempeh. Also fluorescent bacteria streaked in fun shapes on petri plates were all aglow as visitors viewed them under the black light.

Oomycete Symposium

On May 27, 2010, Seogchan Kang hosted the Penn State Symposium on Oomycete Pathosystems: Challenges in Understanding and Managing Oomycetes, which was sponsored by the USDA-AFRI Microbial Genomics and Plant Biosecurity Programs, Department of Plant Pathology, and College of Agricultural Sciences. This symposium was organized to highlight major challenges that hinder our efforts to understand and manage Oomycete pathosystems and to seek out solutions to these challenges. The program included speakers from around the U.S. and Canada.

2010 Ag Day

On April 21, 2010, the College of Agricultural Sciences hosted "Ag Day," an event showcasing the programs and accomplishments of the College, its students, and the field of agriculture. Visitors had an opportunity to walk around and interact with exhibitors at the various displays on HUB lawn and upon completion, received a free Creamery ice cream cone. The Department of Plant Pathology display included a mini-golf game associated with connecting symptoms of plant diseases with pathogen groups, a number of herbarium samples and an explanation of commercial mushroom production with live samples from the Mushroom Research Center. Many of the graduate students spent time hosting the display and shared their enthusiasm for the field of Plant Pathology with Ag Day visitors.

Judy Sinn counseling the next generation of plant pathologists at Ag Progress Days

2010 Ag Progress Days

Wow! Would you look at that!

APD Plant Pathology display

Future Pathologist

Guest Seminar Speakers

Spring Semester 2010

Dr. Ming Tien
Department of Biochemistry &
Molecular Biology, Penn State
Title: *Transcriptome and proteomics studies on fungal wood decay*

Dr. Seong Hwan Kim
Pa. Department of Agriculture,
Harrisburg, PA; Penn State Adjunct
Professor of Plant Pathology
Title: *Newly emerging and chronic Xanthomonas spp. on tomato and pepper in Pennsylvania*

Ashley Walter
Pa. Department of Agriculture,
Harrisburg, PA
Title: *Invasive plants in Pennsylvania*

Dr. Meg McGrath (Ph.D. 1988)
Department of Plant Pathology & Plant-Microbe Biology, Cornell
University, Riverhead, NY
Title: *Agricultural crisis of 2009 caused by the disease famous for the Irish potato famine*

Dr. Joan Bennett
Department of Plant Biology &
Pathology, Rutgers University,
New Brunswick, NJ
Title: *Doing science with two X chromosomes: Floods, fungi and feminism*

Dr. Michael Goodin (Ph.D. 1995)
Department of Plant Pathology,
University of Kentucky, Lexington, KY
Title: *Tracks out of the nucleus: How do rhabdoviruses move cell to cell*

Dr. Anne Dorrance
Department of Plant Pathology,
The Ohio State University, Columbus, OH
Title: *Management of oomycete diseases of soybean: Progress and challenges*

Dr. Carole Bassett
USDA-ARS-AFRS, Kearneysville, WV
Title: *Fruit tree stress responses: Looking at the forest to see the trees*

Hehe Wang
Ohio State Student Exchange Seminar
Department of Plant Pathology, The Ohio State University, OARDC, Wooster, OH
Title: *Discovery of genetic mechanisms for partial resistance to P. sojae in soybean*

Fall Semester 2010

Dr. Jeff Alwang
Department of Agricultural & Applied
Economics, Virginia Tech, Blacksburg, VA
Title: *Trust and technology diffusion in remote Ecuador: How can agricultural research benefit remote Naranjilla farmers?*

Dr. Nina Shishkoff
USDA-ARS, Ft. Detrick, MD
Title: *Sudden Oak Death: The risk to Eastern forests*

Dr. Andrew Read
Departments of Biology and Entomology,
Penn State
Title: *The future of infectious disease in a pharmaceutical age*

Dr. Michael Glenn
USDA-ARS-AFRS, Kearneysville, WV
Title: *Particle films and their role in plant production*

Dr. Roger Innes
Department of Biology, Indiana University,
Bloomington, IN
Title: *Molecular mechanisms underlying pathogen recognition in plants*

Fall Semester 2010

Dr. Jonathan Lynch
Department of Horticulture, Penn State
Title: *Roots of the second Green Revolution*

Jonathan Oliver
Cornell University Student Exchange Seminar
Department of Plant Pathology & Plant-Microbe Biology, Cornell University, Geneva, NY
Title: *Using grapevine fanleaf virus genetic variability information to develop, improve, and test constructs for control through genetic engineering*

Dr. Harald Scherm
Department of Plant Pathology, University of Georgia, Athens, GA
Title: *Epidemiological synthesis: New lessons from old data*

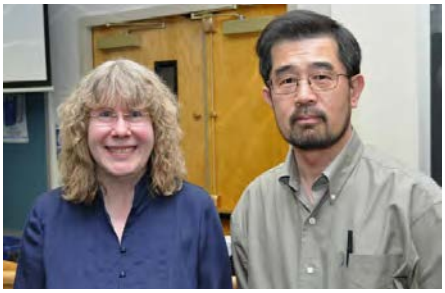
Alyssa Collins
Penn State Southeast Ag Research & Extension Center, Landisville, PA
Title: *On-farm research at the Southeast Ag Research and Extension Center*

Dr. Rachel Brennan
Department of Civil & Environmental Engineering, Penn State
Title: *Sustainable removal of endocrine disrupting chemicals from wastewater using fungi*

Richard R. Nelson Memorial Lectures

The Richard R. Nelson Memorial Lectures were established in memory of Dr. Richard R. Nelson (1926-1991). Dr. Nelson joined the faculty of the Department of Plant Pathology in 1966 and was subsequently named Evan Pugh Professor in 1974. Dr. Nelson retired from Penn State with Emeritus rank in 1985.

On April 5, 2010, **Dr. Barbara Valent**, University Distinguished Professor, Department of Plant Pathology, Kansas State Universtiy, presented *Battle Inside a Rice Cell: Effector Dynamics During Biotrophic Invasion by the Rice Blast Fungus, Magnaporthe oryzae*


Dr. Valent and Dr. Kang


Dr. Valent was presented with a Plant Pathology polo

Dr. Valent studies rice blast disease, one of the most explosive diseases threatening rice production worldwide. Dr. Valent led the establishment of this disease as a model for understanding the molecular and cellular mechanisms underpinning host specificity and pathogenesis.

Nick Dufault (Ph.D. 2008), completed a post-doc in **Scott Isard**'s program, and accepted a position as Assistant Professor in the Department of Plant Pathology University of Florida, and began his new responsibilities in Gainesville in November 2010.

Alex Enyedi (Ph.D. 1991) writes that "Following a national search at Western Michigan University(WMU), I became the new dean of the College of Arts and Sciences at WMU. The College of Arts and Sciences is WMU's largest degree-granting college. Home to 360 faculty, over 7,500 students are enrolled in over 100 degree programs in 26 departments and schools that are part of the college. Prior to being named dean, I served as the associate dean for the college for 5 years and also served four years as the chairman of the department of Biological Sciences." Western Michigan University is located in Kalamazoo.

Kelly Ivors (Ph.D. 2002) was promoted to Associate Professor in 2010 after her 5th year in the Department of Plant Pathology at North Carolina State University. Kelly's research and extension program focuses on the population biology and management of Phytophthora diseases.

Reid Frederick (B.S. PLTSC 1981) is a Research Molecular Biologist in the USDA-ARS Foreign Disease-Weed Science Research Unit at Ft. Detrick, MD, and is an adjunct member of the Plant Pathology faculty, working with Seogchan Kang.

Steven Lazzaro (B.S. PLTSC 1978) writes, "I have never worked in PPATH, plant science or any biology field since I graduated. I have been a junior and senior high math, science, and computer teacher as well as Principal of Faith Christian School in Wilkins Township (Turtle Creek PO) since I graduated, starting in 1978. This is my 33rd year and I love it as much, if not more, than ever. I have shared info from the Penn State Ag magazine with my students from time-to-time (and some facts that I learned in it with adults - like how PA is no. 1 in hardwood production, among other things!) I haven't been on campus for many years, so my wife and I visited the campus on October 8th and got to see the new arboretum. We also went in the Frost Entomology Museum in Headhouse III, and of course, enjoyed some ice cream at the creamery."

Leon Kneebone (Ph.D. 1950), professor emeritus, who retired from the faculty in 1978, and his wife, Libby, celebrated their 65th anniversary in 2010; she is 88 and he is 90. They have lived at the Village at Penn State for the past six years, and says, "We are grateful." The department was very pleased to welcome Leon back for a visit to the department in March of 2011, to attend our annual awards ceremony. Emeritus faculty members Jim Bloom, who retired from the faculty in 1987, and Herb Cole (Ph.D. 1957) also attended the ceremony, and shared reminiscences with the many department members, new and old, who were there.

L. Kneebone, H. Cole, J. Bloom 2011

Congratulations to **Larry Moore** (Ph.D. 1965), who received the Boy Scouts of America 100th Anniversary National Hall of Leadership Award in 2010. Larry's wife, Mary Anne, sent this account of the award: "Laurence D. Moore, MS '61, PhD, '65, is one of a select group of individuals chosen for a one-time honor by the Boy Scouts of America. From among 7000 nominations nationwide, fewer than 300 were chosen and inducted into the BSA 100th Anniversary National Hall of Leadership. In presenting the award, Larry was cited for 65 years of service to the BSA. He is an Eagle Scout and has served in numerous scouting positions including Webeloes Leader, Scout Master, District Commissioner and Council Vice President of the Blue Ridge Mountains Council. Larry has been awarded the Scouter Key, District Award of Merit, George Gerbrich Leadership Award, St. George Award of the Catholic Church and Silver Beaver. He has been active in a number of organizations including Jaycees, Torch and Rotary and in his church where he was a communion minister and chair of the Stewardship Committee and Finance Council. Since retiring from Virginia Tech, Larry has served as a member of the US Coast Guard Auxiliary where he is currently Commander of Flotilla 83."

Barry Nolt (Ph.D. 1984) sends this update on his professional career: "I continue as an Assistant Professor at Bloomsburg University with teaching responsibilities in general biology, cell biology and microbiology. I also teach a Virology course and a Plant Pathology course for our upper level undergraduate and graduate students. My current research areas include: Pythium root rot of greenhouse ornamentals, disease suppression using composted materials, and optimizing conditions for maximum methane yields from anaerobic digesters. Thanks for the invitation to submit an update."

Payungsak Rauyaree "M" (Ph.D. 2003) sends Seasons Greetings from Thailand, with wishes for a Happy New Year 2011 to everyone.

John Skelly (Ph.D. 1968) writes that he and Linda "continue to enjoy the 'retired life' at Lake Anna in the central Piedmont Region of Virginia. Both of us are involved with many activities (but the nice part is that they are of our own choosing) with Linda serving as President of our Home Owner's Association, secretary of the Belmont Women's Club, and secretary of our Parish Council. I am involved with our Ruritan Club, member of the Lake Anna Civic Association and Chair the Environmental Education Programs committee, and do some volunteer teaching at the Lake Anna State Park for school kids and summer visitors . . .lots of great fun for both of us. We are trying to start a Tree Evaluation Service for homeowners within our 108 developments around the Lake Anna area . . .tough going but a few calls for assistance have already been received. These activities along with visits to and from our four families during the summer months keep us active with a full schedule . . .we both seem ready to retire again!!! . . .and our first great grandchild is expected around Christmas time . . .wow, time sure flies when you're having fun."

Mark Spear (M.S. 1983) sent this news : "Rebecca Miller, my wife, attended PSU at the same time I did and was well known to everybody in the department at that time. She has hung out her own shingle as a consultant for the mushroom industry. Currently she is working from home and has more requests for help than she can handle."

Chris Wallis (M.S. 2004) is a research plant pathologist at the USDA-ARS San Joaquin Agricultural Science Center in Parlier, CA. Chris currently researches different chemicals grapes and almonds produce to defense themselves from the *Xylella fastidiosa* bacteria. He also reports that his wife and 3 kids are doing fine in adapting to the hot climate in the central valley of California."

Larry Zang (M.S. 1984) is still living in Greensboro, NC, working for Syngenta Crop Protection (25 years) in state regulatory affairs. Larry is married, with a 17-year-old daughter and 19-year old son.

Tammen Endowment

An endowment has been established in the Department of Plant Pathology to honor Dr. James Tammen and his wife, Marilyn. Dr. Tammen strongly supported the need for international student experiences for professional development, and this endowment will support international education and research opportunities for students engaged in plant pathology studies abroad.

Contributions may be directed to The College of Ag Sciences Development Office, Attn. Mark Theiss, 240 Ag Admin Bldg, University Park, PA 16802; 814-863-8027; mjt118@psu.edu; or on line at www.giveto.psu.edu. Please make checks payable to Penn State, with a notation for the Tammen Endowment, code XCATM.

1984 portrait commissioned by the Department of Plant Pathology

1963 first head of the Penn State Department of Plant Pathology

1960 in the field (rose spray trial); James Tammen (center) with Jerry Haas (left, J. Tammen's Ph.D. student), and Jesse Livingston (right, then head of the Department of Botany and Plant Pathology)

Depattment Heads

Penn State Plant Pathology Department Heads: seated (l-r): James Tammen (1963-75), James R. Bloom (interim, 1975-76); standing (l-r): Samuel H. Smith (1976-81), John M. Skelly (1982-85), Herbert Cole, Jr. (1986-93), Elwin L. Stewart (1993-2002), Leonard J. Francl (2002-2005)
Photo - 2003

2006 named Penn State Professor Emeritus of Plant Pathology

2003 40th Anniversary of the Department of Plant Pathology

2009 presentation of “A History of the Department of Plant Pathology, 1963-1976” to the Penn State University Archives

Plant Pathology Endowments

Thank you alumni and friends for your contributions to the endowments in Plant Pathology. Your support and your generosity make possible many activities that enrich and enhance our programs.

Program Support

Leonard J. Francl Memorial Endowment in Plant Pathology
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Laurence D. and Mary Ann Moore Faculty and Staff Award in Plant Pathology
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Plant Pathology Graduate Studies Enhancement Fund

If you would like to contribute to any of our endowments, please send your gifts in care of the Department of Plant Pathology, 212 Buckhout Lab, University Park, PA 16802. Please make checks payable to The Pennsylvania State University, and please be sure to specify which endowment you wish to support.

Thank you.....
Thanks are extended to the members of the PPATH Public Relations and News Committee (Dave Geiser, Yinong Yang, Beth Gugino, Scott Isard, and Nancy Wenner), Amy Perryman, and Cathy Nardozzo for their efforts in compiling this edition of the Plant Pathology Newsletter. Thanks are also extended to the alumni, friends, faculty, staff, post-docs, and graduate students who contributed news items and/or photographs to this year's edition.

To our alumni and friends – please keep in touch! Please send your address updates and news to the Department of Plant Pathology, c/o Becky Peplinski, 212 Buckhout Laboratory, University Park, PA 16802 (rlp1@psu.edu).

Visit us on the web at: http://plantpath.psu.edu/