

PPWS News

Plant Pathology, Physiology and Weed Science

www.ppws.vt.edu

2012

Greetings

Welcome to our annual Plant Pathology, Physiology, and Weed Science newsletter, which shares departmental successes of the past year with alumni, colleagues, and friends. During the 2011-12 academic year, we celebrated many accomplishments and awards earned by PPWS graduate students, including eight who graduated. Through the generosity of several PPWS alumni, a poster competition was established to provide travel awards to outstanding graduate students. Our 2011 AREC and Ag Industry Tour returned to the Tidewater, Virginia Beach, and Eastern Shore ARECs and was a valuable opportunity for students to see the impact of PPWS research in a real-world setting. The new greenhouse at our Glade Road facility has provided quality space for our research and training efforts. This spring, PPWS honored two emeriti faculty members, Pat Phipps and Sue Tolin, as the newest inductees in the departmental hall of fame. We welcome two new office staff members and anticipate the fall arrival of a new faculty member. We hope that we will have an opportunity to visit with many of you at meetings and conferences in the upcoming year, and you are always welcome to drop by the department.



Elizabeth Grabau, department head

Elizabeth Grabau, department head

Alumni Spotlight

Rob Richardson (Ph.D. '02) is an associate professor and Extension specialist in the Department of Crop Science at North Carolina State University. Rob was awarded the College of Agriculture and Life Sciences 2012 Outstanding Departmental Recent Alumni Award. His research and Extension appointments focus on aquatic and non-cropland weeds, primarily focusing on aquatic weed and invasive plant management in non-cropland. His work is critical for developing integrated and sustainable weed management programs for reservoirs, lakes, ponds, other bodies of water, and non-cropland in North Carolina and the surrounding region. Vegetation on these sites must be managed in an environmentally sound manner to improve or maintain fish and wildlife habitat, improve biological diversity, and reduce the size and scope of alien plant invasions.



Note: Please update your information at the Alumni Association website at www.alumni.vt.edu/gateway (select "View and Update Your Profile").

Annual AREC-Ag Industry Tour



Tour participants (from left to right: Binbin Lin, Devdutta Deb, Emeritus Professor Erik Stromberg, Kevin Fedkenheuer, Alex Weisberg, A. J. Prussin, Associate Professor John McDowell, Jessica Cooper, Shelley Moore, Nicole Juba, Professor Jeffrey Derr, and Ocean View Golf Course Superintendent Jay Wade) listen to an overview of turf trials from Research Assistant Adam Nichols (on right). Gunjune Kim, the photographer, is not pictured.

Ten graduate students and three faculty members participated in the third annual Agricultural Research and Extension Center-Ag Industry Tour in August 2011. Participants visited three ARECs (Tidewater, Eastern Shore, and Hampton Roads). They also toured Ocean View Golf Course in Virginia Beach and Renwood Farms in Charles City. Tour participants learned how peanuts are processed at Hubbard Peanut Company in Sedley. On the Eastern Shore they observed grape tomato postharvest production at Pacific Tomato Growers. They also enjoyed a tour at Chatham Vineyards in Machipongo that included a wine tasting.

Theses and Dissertations

Bimal Sajeewa Amaradasa, Elmwood Park, Ill. (Ph.D. '11), "Accurate Identification and Grouping of *Rhizoctonia* Isolates Infecting Turfgrasses in MD and VA and Their Sensitivity to Selected Fungicides *in vitro*."

Ryan Anderson, Easton, Md. (Ph.D. '11), "Identification and Functional Characterization of RXLR Effector Proteins that are Conserved Between Downy Mildew Pathogens and *Phytophthora* Species."

Rongman Cai, Lixian, Hunan, China (Ph.D. '12), "New Hypotheses about the Origin of *Pseudomonas syringae* Crop Pathogens."

Christopher Clarke, Mechanicsville, Va. (Ph.D. '12), "Elucidating Three Novel Mechanisms of *Pseudomonas syringae* Pathogenicity."

Matthew Cutulle, Ellicott City, Md. (Ph.D. '11), "Turfgrass Species Composition, Resistance Mechanisms, and Management Strategy Impacts on Brown Patch Incidence and Weed Encroachment."

Nicole Juba, Cheshire, Conn. (Ph.D. '11), "Metabolic Engineering of the Pterin Branch of Folate Synthesis by Over-Expression of a GTP Cyclohydrolase I in Peanut."

Piyum Khatibi, Sayville, N.Y. (Ph.D. '11), "Reduction of the Mycotoxin Deoxynivalenol in Barley Ethanol Co-products Using Trichothecene 3-O-acetyltransferases."

Sasha Marine, Marshfield, Wis. (Ph.D. '12), "Characterization of Fungicide Resistance in *Venturia inaequalis* Populations in Virginia."

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Awards, Scholarships, and Recognition

Alumni

Mason Carter (B.S. '55, M.S. '57) was awarded the College of Agriculture and Life Sciences 2012 Outstanding Departmental Alumni Award.

Rob Richardson (B.S. '96, M.S. '97, Ph.D. '02) was awarded the College of Agriculture and Life Sciences 2012 Outstanding Departmental Recent Alumni Award. Refer to "Alumni Spotlight" on the first page of this newsletter for more details.

Faculty



Jeff Derr

Jeff Derr, professor, was named a Weed Science Society of America Fellow, and **Shawn Askew**, associate professor, was awarded the Early Career Weed Scientist Award at the Weed Science Society of America's annual meeting in Waikoloa, Hawaii, Feb. 6-9.



Shawn Askew

Jacob Barney, assistant professor, was an invited speaker at the 4th International Energy Farming Congress in Papenburg, Germany, March 13-15. His seminar was titled, "Bioenergy crops and invasive species: potential problems and opportunities."



Jacob Barney

Jon Eisenback, professor, was elected the vice president of the Society of Nematologists at the 50th Anniversary Meeting, where he also gave the keynote speech, "Memoirs of N. A. Cobb on the occasion of the 50th annual meeting of the Society of Nematologists," July 17-21,



Jon Eisenback

2011, in Corvallis, Ore. Jon was also selected as a European Master of Science in Nematology scholar and taught a two-week nematology course at the University of Evora in Portugal during the 2011 fall semester.

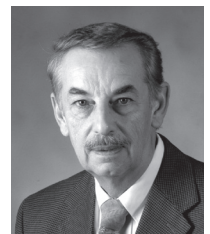
Portraits of Emeritus professors, **Patrick Phipps** and **Sue Tolin**, were added to the PPWS Hall of Fame in recognition of their laudable contributions to the department. The department commemorated this with a luncheon in their honor in June.

David Schmale, associate professor, was recognized as a 2011 Teacher of the Week by the Center for Instructional Development and Educational Research.

Jim Westwood, professor, was recognized by the Virginia Tech Office of the Vice President for Research as Scholar of the Week.



Sue Tolin



Pat Phipps



David Schmale



Jim Westwood

New Greenhouse at Glade Road Complex

In the aftermath of a snow-induced collapse of an old greenhouse, PPWS is the proud parent of a new state-of-the-art greenhouse at the Glade Road complex. The new greenhouse has significant improvements over the previous greenhouse, including seven rolling benches, each with an independently controlled drip and overhead irrigation line. The house is outfitted with a "fertigation" system and a dynamic controller that is the brains of the operation. The greenhouse will also be equipped with a computer-controlled system to provide remote alerts should the environmental settings change. This facility will provide ideal conditions for experiments and is a showpiece for the department.



Students

Devdutta Deb was awarded a travel award from the Oömycete Molecular Genetics Network to attend their annual meeting in Nanjing, China in May.

Jessica Cooper was awarded second place in the graduate student paper competition at the APS Potomac Division Meeting in Winchester, Va., March 14-16.

Matthew Cutulle was named the outstanding Ph.D. student at the Northeastern Weed Science Society annual meeting in Philadelphia, Pa., January 3-6.

Kate Fiedler received an American Phytopathological Society travel award to attend a "Standing up for Science" media workshop in Cambridge, Mass., on April 24. Kate was also awarded an APS graduate student travel award to attend the 2012 APS meeting in Providence, R.I.

Matthew Ho, research associate (formerly undergraduate) in **Jacob Barney's** lab, received an Undergraduate Research Award from the Weed Science Society of America for his project, "Expanding the niche: The role of nutrient poor soil tolerance and invasiveness in perennial grasses."

award will fund Taylor to travel to the 2012 APS meeting in Providence, R.I.

Gunjune Kim and **Devdutta Deb** were selected (along with two other Molecular Plant Sciences students) to participate in the graduate student oral presentation competition with their respective presentations: "Parasitic plants exchange a wide range of mRNAs with hosts" and "Conserved effector proteins from oomycetes *Hyaloperonospora arabidopsidis* and *Phytophthora sojae* suppress immune responses in plants" at the 3rd annual MPS Mini-Symposium in Blacksburg, Va., on March 30.



Ryan Anderson, former award winner, gives the 2012 Arthur J. Webber Outstanding Graduate Student Award to Megan LeBlanc (Devdutta Deb who also received the award is not pictured.)



APS Potomac Division Vice President Yilmaz Balci, assistant professor at University of Maryland, presents the first place Graduate Student Paper award to Taylor Jones.

Taylor Jones was awarded first place in the graduate student paper competition for his presentation, "Documentation of grapevine leafroll-associated virus-2, -3, and grapevine fleck virus in wine grape varieties and native grape species in Virginia," at the APS Potomac Division Meeting in Winchester, Va., March 14-16. This

Megan LeBlanc and **Devdutta Deb** were both selected as recipients of the PPWS 2012 Arthur J. Webber Outstanding Graduate Student Award.

Shelley Moore was awarded the first prize for her poster, "Functional Analysis of plant glutamate-like receptors (GLRs)," at the MPS mini-symposium in Blacksburg, Va., March 30.

Charlotte Oliver's (B.S. biological sciences '12 and former laboratory assistant in the Plant Disease Clinic) poster "First report of bacterial leaf spot caused by *Xanthomonas hortorum* in the U.S.," which featured her PPWS undergraduate research, was selected for a "Highlight Spot" in the Newman Library at the 10th annual VT Undergraduate Research Conference, April 19.

Students (cont.)

Stephanie Pollard received a travel award to attend the first annual APS Human Pathogens on Plants Workshop in Hyattsville, Md., February 13-15.

Larissa Smith received an honorable mention for her presentation, "Establishment year evaluation of the agronomic and invasive potential of fertile *Miscanthus x giganteus*" at the annual Mid-Atlantic Ecological Society of America Meeting in Blacksburg, Va., on April 14.

Dan Tekiela was awarded second place in the Graduate Student Paper Contest for his presentation,

"Economics, efficacy, and non-target effects of managing the forest understory invader *Microstegium vimineum*," at the annual meeting of the Northeastern Weed Science Society in Philadelphia, Penn., January 3-6. Dan was also selected as a member of the inaugural class of the CALS Graduate Teaching Scholar. As a scholar, Dan will participate in an intense teaching program as he pursues a Ph.D.

Xiao Yang was awarded first place in the 2011 APS Video Contest, It's a Microbial World After All, for his video, "A Soybean Aphid Legend": www.apsnet.org/members/outreach/opro/Pages/VideoContest.aspx

Faculty and Staff Updates

The following members of PPWS are commended for their years of service to the university: Shawn Askew (10), Anton Baudoin (30), and Claude Kenley (35).



Mizuho Nita

Mizuho Nita, research and Extension grape pathologist at the Alson H. Smith, Jr. Agricultural and Research Extension Center, was

promoted to tenure-track assistant professor. **Jim Westwood** was promoted to full professor.

Michelle Sare, financial analyst and grants manager, joined PPWS in April. **Cris Thompson**, graduate student and communications coordinator, joined PPWS in June.

Donna Ford, executive secretary senior, retired in June. **Diane Reaver**, laboratory specialist senior, retired in September.

iPlant Workshop

Professor **Ruth Grene** hosted a workshop sponsored by the National Science Foundation and iPlant Collaborative in Blacksburg, Va., Sept. 12-14, 2011. Dr. Nick Provart (University of Toronto), Dr. Bjoern Usadel (Max Planck Institute, Potsdam), and a number of iPlant personnel from the University of Arizona and the Texas Advanced Computing Center participated. Virginia Tech faculty, post-docs, and graduate students learned to use the iPlant Discovery Environment to integrate bioinformatic tools, create workflows and analyze data. In addition, members of the VT Laboratory for Information Visualization and Evaluation demonstrated ways to use large screen displays as a data-mining tool to facilitate discovery of novel relationships and pathways. (iPlant Collaborative: www.iplantcollaborative.org/challenge/iplant-genotype-phenotype/visual-analytics)



Ruth Grene

PPWS has strong presence at the Annual Meeting of the APS Potomac Division

The 2012 meeting of the Potomac Division of the American Phytopathological Society was held March 14-16 in Winchester, Va. The local arrangements committee was chaired by **Mizuho Nita**, assistant professor, and **Keith Yoder**, professor, who are located at the Alson H. Smith, Jr. Agricultural Research and Extension Center in Winchester. The Executive Committee consisted of President **Boris Vinatzer**, associate professor; Immediate Past President **Mary Ann Hansen**, instructor; Vice President Yilmaz Balci (University of Maryland); and Secretary-Treasurer Bingyu Zhao (Horticulture, VT). The Industry and Extension Update was chaired by **Chuck Johnson**, professor. Professor **Caitilyn Allen** (Ph.D. plant pathology and weed science '87) from the University of Wisconsin at Madison gave the plenary talk, "Doing well by making do: How *Ralstonia solanacearum* thrives in its host plants." **Taylor Jones** and **Jessica Cooper** received first and second place, respectively, in the graduate student paper competition. It is evident that PPWS continues to be a very strong presence in the Potomac Division of APS.



Yilmaz Balci, University of Maryland, APS Potomac Division president 2012-13 and Boris Vinatzer, 2011-12 APS Potomac Division president.

First Annual PPWS Graduate Student Poster Competition, Nov. 16, 2011, Blacksburg, VA

Award Recipients

Akshay Kakumanu	"Drought stress transcriptome analysis in maize vegetative and reproductive tissues using RNA-Seq"
Gunjune Kim	"Genomic approaches to understand mRNA movement between hosts and parasites"
Megan LeBlanc	"Identification and distribution of host mRNA transcripts in the parasitic plant dodder"
A. J. Prussin	"Tracking the long distance movement of <i>Fusarium graminearum</i> , the causal agent of Fusarium Head Blight in wheat and barley"

Honorable Mentions

Amro Ahmed	"The physiology of grain yield and variety advancement of soft red winter wheat in Virginia"
Chris Clarke	"Fls2 detects two distinct epitopes of bacterial flagellin in an allele-specific manner"
Kate Fiedler	"Development of non-invasive inoculation method of tomato fruit with <i>Geotrichum candidum</i> to improve post-harvest disease management strategies"
Daljrit Singh	"Physiological and metabolic responses of Virginia-type peanut to drought and extreme temperatures"



Third Annual MPS Mini-Symposium

The Molecular Plant Science Mini-Symposium is an annual forum that brings three leading molecular plant scientists to interact with Virginia Tech faculty and students for a full day of scientific lectures and presentations. The third annual MPS Mini-Symposium was held March 30. Invited symposium speakers were Drs. Jo Ann Banks (Purdue Univ.), Gloria Muday (Wake Forest Univ.), and Joseph Noel (Salk Institute). Dr. Banks spoke about the whole genome sequence of the primitive plant *Selaginella*, which is important for understanding the origin of vascular tissues during terrestrial plant evolution. Dr. Noel's lecture was co-hosted by the Virginia Tech Life Science Seminar Series and focused on the evolution of plant metabolism involved in making specialized plant natural product chemicals. Dr. Muday's lecture focused on coordinating ethylene and auxin signaling in roots.

Shelley Moore's poster was awarded the best graduate student poster at the third annual MPS Mini-Symposium.

Vinatzer and international team

unravel origin of devastating kiwifruit disease

An international team led by associate professor **Boris Vinatzer** and Giorgio Balestra (University of Tuscia, Italy) found the likely geographic origin of a devastating bacterial pathogen of kiwifruit. Since 2008, *Pseudomonas syringae* pv. *actinidiae* has been destroying kiwifruit orchards in Europe, South America, and New Zealand, threatening the world's kiwifruit industry.

The team used a novel approach to unravel the origin of the bacterium: whole genome sequencing. Their results indicate that the bacterium probably originated in China, home of the genus to which kiwifruit belong. They published a paper on this work in the journal PLoS ONE. Virginia Tech undergraduate student **Tokia Goodman** and graduate student **Rongman Cai** (Ph.D. '12) performed an important part of the experimental work and computer analysis in Vinatzer's laboratory. Currently this pathogen has not been found in the U.S.; however, if it is, this research will allow early and accurate diagnosis of the disease and help slow its spread or allow eradication. This work will also lead to new insights into the adaptation of bacterial plant pathogens to crops, which is an integral part of Vinatzer's current National Science Foundation-funded research. The complete Virginia Tech press release and a link to the PLoS ONE publication can be found at <http://www.vtnews.vt.edu/articles/2012/05/051012-cals-kiwifruit.html>.



Associate professor Boris Vinatzer was one of the leaders of an international research team that traced a devastating kiwifruit bacterial pathogen to its likely origin in China.



PPWS

graduate students participate in the Big Event

The Big Event at Virginia Tech is a student-run community service effort that has grown into the second-largest event of its kind in the nation. Every spring, thousands of students, faculty, and staff come together to complete hundreds of community service projects throughout Blacksburg, Christiansburg, and the New River Valley. The goal is simply to thank members of the community.

PPWS Gothic: A few of the PPWS Graduate Student Organization members who participated in the Big Event: (left to right) Daljit Singh, Kurt Vollmer, Stephanie Pollard, and Kate Fiedler.