

PPWS News

Plant Pathology, Physiology and Weed Science

www.ppws.vt.edu

2011

Greetings

Welcome to the annual PPWS newsletter!

I'd like to thank **John McDowell** for serving as acting department head in fall 2010 while I took advantage of a sabbatical at Colorado State University.

Last fall, PPWS added a new faculty member, **Jacob Barney**. In 2011, the department celebrated the promotion of **Steve Rideout** and **David Schmale** to the rank of associate professor with tenure. Congratulations, Steve and David!

Other highlights of the year include many achievements in publication and grantsmanship and the graduation of several graduate students. Faculty members **Boris Vinatzer** and **David Schmale** developed a new course, *Microbial Forensics and Biosecurity*, which had excellent student enrollment. The second annual AREC-Ag Industry tour in August 2010 was a success. In March, we were honored to host PPWS alumnus **Jeff Jones** as the Outstanding Alumnus at the College of Agriculture and Life Sciences awards ceremony and banquet.

Construction of a new, state-of-the-art greenhouse for PPWS is just getting underway. We anticipate completion in the early fall and look forward to using this facility to expand our research programs. We have also planned a departmental retreat this fall to review our strategic plan and chart a course for the next five years.

Please check out the many accomplishments and activities of department members featured in this newsletter and on our website at www.ppws.vt.edu. As always, we hope you will visit if travel brings you to this area.

Elizabeth Grabau



Elizabeth Grabau, department head

Alumni Spotlight

Jeff Jones obtained his master's degree from Virginia Tech in 1974 and his Ph.D. in 1980, with Emeritus Professor **Curt Roane** as his advisor. Subsequently, Jeff did postdoctoral research at the University of Georgia, performing groundbreaking research in diagnostics, ecology, and control of the important tomato disease, bacterial speck. In 1981, Jeff was appointed assistant professor at the University of Florida, where he advanced to the rank of professor.

Over the years, Jeff has authored more than 160 peer-reviewed publications, written more than a dozen book chapters, and edited three books. He has made major contributions to our current knowledge of bacterial tomato diseases by classifying bacterial tomato pathogens, elucidating the genetics of plant-pathogen interactions, and developing new control strategies for these diseases using bacteriophages.

Jeff has served as senior editor for scientific journals and an interim department chair, and was a Fulbright Scholar at the University of Belgrade in Serbia. Since 2001, he has been a Fellow of the American Phytopathological Society. Jeff is currently spearheading an initiative to establish a national culture collection for plant pathogens.



Dean Alan Grant (left) and Elizabeth Grabau, PPWS department head, with Jeff Jones as he receives the 2010 PPWS Outstanding Alumni Award at the CALS awards ceremony and banquet.

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

Recent Faculty Hires

Jacob Barney joined PPWS as an invasive plant ecologist and assistant professor in August 2010. He received his Ph.D. in weed ecology from Cornell University and did his postdoctoral research at University of California-Davis. Jacob's interests are in invasive plants in forested, roadside, and managed ecosystems, with a research focus of applied ecology. He also works with bioenergy crops and is evaluating the risk they pose in becoming invasive species in the Southeast and developing best management plans.



Jacob Barney

Theses and Dissertations

Leigh Ann Harrison, Spring Branch, Texas (Ph.D. '11), "Characterization, Development of a Field Inoculation Method, and Fungicide Sensitivity Screening of the Pythium Blight Pathogen of Snap Bean (*Phaseolus vulgaris* L.)."

Melissa D. Keller, Eads, Texas (Ph.D. '11), "The Contribution of Within-Field Inoculum Sources of *Gibberella zeae* to Fusarium Head Blight in Winter Wheat and Barley."

Shuangchun (Jeremy) Yan, Chengdu, Sichuan, China (Ph.D. '10), "Evolution and Mechanisms of Host Specificity in the Plant Pathogenic Bacterium *Pseudomonas syringae*."

Awards, Scholarships, and Recognition

Alumni

Jeff Jones (M.S. '74; Ph.D. '80) was awarded the College of Agriculture and Life Sciences 2010 Outstanding Departmental Alumni Award. Refer to "Alumni Spotlight" on the first page of this newsletter for more details.

Selester Bennett was posthumously awarded the College of Agriculture and Life Sciences 2010 Outstanding Recent Alumni Award; he passed away before submitting his dissertation. Selester co-founded two companies, Nature Diagnostics Inc. and Applied Food Technologies LLC, which developed molecular diagnostic solutions for food marketing applications. In 2005, Selester co-founded Nature West Inc., a biotech company with a mission to fully exploit the chemical biodiversity of plants to fill critical needs in the pharmaceutical, nutraceutical, agrochemical, and therapeutic markets.



Selester Bennett

Faculty

Shawn Askew, associate professor, was the invited speaker at the 2010 Korean Pesticide Science Society meeting in Daejeon, South Korea. His graduate students, **Angela Post** and **Brendan McNulty**, gave presentations on their herbicide research.



From left: Julie Keating, Angela Post, Brendan McNulty, S.J. Koo (Ph.D. and CEO of Moghu Research Center in South Korea), and Shawn Askew.

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Awards, Scholarships, and Recognition

Faculty (continued)

Jon Eisenback, professor, took home first prize for his logo design for the APS Potomac Division at its annual meeting.

Elizabeth Grabau, professor and department head, and **Patrick Phipps**, professor emeritus, co-authored a *Phytopathology* Editor's Pick article for July 2011 (101:786-793): "Sclerotinia blight resistance in Virginia-type peanut transformed with a barley oxalate oxidase gene."

Darcy Partridge-Telenko and **Jiahuai Hu** (Ph.D. '07) were postdoctoral research associates on this research and co-authors of the publication.

Boris Vinatzer, associate professor, was co-author of the July 2011 *Phytopathology* Spotlight, Open Access Article (101:847-858): "Multilocus sequence typing of *Pseudomonas syringae* sensu lato confirms previously described genomospecies and permits rapid identification of *P. syringae* pv. *coriandricola* and *P. syringae* pv. *apii* causing bacterial leaf spot on parsley." **Christopher Clarke** and **Rongman Cai**, Ph.D. candidates in the Vinatzer lab, are co-authors of the publication.

Steve Rideout and **David Schmale** were promoted to associate professor.



Jon Eisenback



Steve Rideout



David Schmale

Students

The following PPWS scholarships were awarded in Fall 2010:

Christopher Clarke and **Adam Smith** were each awarded the Bruce W. Perry Scholarship.

Gunjune Kim was awarded the Chester L. Foy Scholarship.

Jeremy Yan was awarded the Hatzios Crop Protection Scholarship and the Hatzios Weed Science Graduate Scholarship.

Students (continued)

Ryan Anderson received the PPWS 2011 Arthur J. Webber Outstanding Graduate Student Award.



Nicole Juba, 2010 Arthur J. Webber Award recipient, presents the 2011 award to Ryan Anderson.

Gunjune Kim won the graduate student oral competition, and **Megan LeBlanc** won the graduate student poster competition at the 11th World Congress on Parasitic Plants, held in Martina Franca, Italy.

Sasha Marine and **Lynn Rallos** were both awarded first place in the 2011 American Phytopathology Society Potomac Division student paper competition for their contributed papers: "Stability of QoI Resistance in Grape Powdery Mildew" and "Seasonal Distribution of SI Fungicide Resistance in Apple Scab in Virginia," respectively.



Sasha Marine (left) and Lynn Rallos with their first-place awards for the APS Potomac Division student paper competition.

Faculty and Staff Updates

The following faculty members are commended for their years of service to the university: **Cynthia Denbow** (30), **Jon Eisenback** (25), **Elizabeth Grabau** (20), **Shawn Askew** (11), and **John Jelesko** and **John McDowell** (10).

Second Annual MPS Mini-Symposium

The second annual Molecular Plant Science (MPS) mini-symposium was held in March 2011 with the theme "Plants and Communication." Professor **Jim Westwood** served as coordinator and 75 scientists and students attended.

Featured speakers Ian Baldwin (Max Planck Institute for Chemical Ecology, Jena, Germany), Bill Lucas (University of California-Davis), and Pamela Hines ("Science" magazine) covered topics ranging from the ecology of plant chemical signaling to phloem biology and its role in signaling within plants, as well as publishing and alternative careers in science.

Among the winners of the graduate student poster competition was **Christopher Clarke** (Vinatzer lab).

In addition, the MPS program announced the first winners of the MPS student grant competition, with PPWS students **Ryan Anderson** (McDowell lab), **Christopher Clarke** (Vinatzer lab), **Gunjune Kim** and **Megan LeBlanc** (Westwood lab), **Shelley Moore** (Okumoto lab), and **Alex Weisberg** (Jelesko lab) receiving awards.

Dennis Dean, director of the Fralin Life Science Institute, supported the symposium.



Christopher Clarke, Ph.D. candidate in the Vinatzer lab, discussing his poster at the MPS Mini-Symposium. Clarke won first place in the student poster competition.

Phil Keating, laboratory specialist senior, retired in July 2010. **Kevin Hensler**, greenhouse and field plot manager, and **Andrew Mike**, network/systems administrator, recently joined PPWS.

APS Potomac Division Meeting

Approximately 90 guests attended the annual meeting of the American Phytopathological Society's Potomac Division in Delaware in March 2011. PPWS was well-represented on the Executive Committee, with **Mary Ann Hansen**, instructor, serving as president and **Boris Vinatzer**, associate professor, serving as vice president.

Professor **Brett Tyler** of PPWS and Virginia Bioinformatics Institute was the meeting's plenary speaker. He gave a presentation on "How Effectors From Oomycetes, Fungi, and Insects Promote Plant Disease: From Genomics Toward Prevention."

Emeritus Professor **Gary Griffin**, who is active in research on thousand cankers disease, presented "Threat of Thousand Cankers Disease to Black Walnut in the East: Lessons From Chestnut Blight, Dutch Elm Disease, and White Pine Blister Rust."

Graduate students **Lynn Rallos** and **Sasha Marine** both received first place awards in the student paper competition.



Mary Ann Hansen, 2010-11 APS Potomac Division president, hands the gavel to Boris Vinatzer, 2011-12 president.

AREC-Ag Industry Tour

Thirteen PPWS graduate students and four faculty members participated in the second annual Agricultural Research and Extension Center-Ag Industry Tour on August 17-19, 2010. The group visited the Shenandoah Valley, Alson H. Smith Jr., Eastern Virginia, and Southern Piedmont ARECs.

They were able to see many common plant pathogens that Virginia growers must manage in their operations. Agricultural production facilities and farms participating

in the tour included an apple processing plant at Bowman Fruit Sales, Chateau O'Brien Winery and Vineyard, soybean fields at Montague Farms, Felker and Turner tobacco farms, and tobacco curing facilities at Clary Farm. Montague Farms was a great example of using state-of-the-art technology for planting and crop protection, as well as marketing an unusual, small seed variety of soybean for the Japanese market.



Tour group participants pictured in front of a Pittsylvania County tobacco field. From left, Brendan McNulty, Professor Erik Stromberg, Professor John McDowell, Ryan Anderson, Nicole Juba, Devdutta Deb, Professor Chuck Johnson, Megan LeBlanc, Shelley Moore, Christopher Clarke, Jeremy Yan, Assistant Professor Eva Collakova, Lynn Rallos, Wei Hao, Yihua Fang, and Shi Yu. (Photographer Gunjune Kim is not pictured.)

Westwood Lab at International Parasitic Plant Conference

Professor Jim Westwood and graduate students **Megan LeBlanc** and **Gunjune Kim** attended the 11th World Congress on Parasitic Plants in Martina Franca, Italy, June 7-12, 2011. Jim is president of the host organization, the International Parasitic Plant Society.

Jim, Gunjune, and Megan gave presentations from their work on the parasitic plant genome project (PPGP) and a workshop on a new database of parasite gene sequences generated by the PPGP. Both Gunjune and Megan took home honors (and 100 Euros) for winning graduate student oral and poster competitions, respectively.



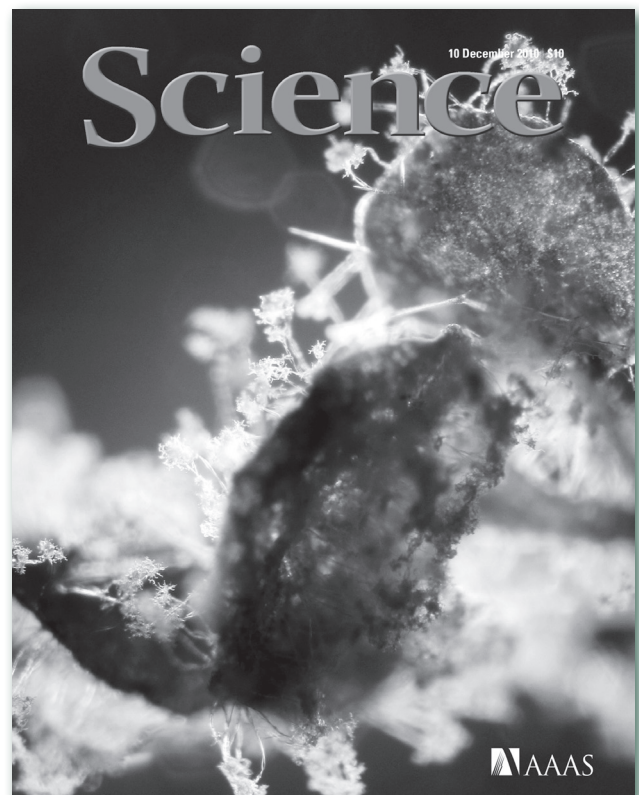
Megan LeBlanc, Gunjune Kim, and Jim Westwood at the World Congress on Parasitic Plants Conference in Italy.

On the Cover of “Science”

Associate Professor **John McDowell**'s research group has been using *Hyaloperonospora arabidopsidis* (*Hpa*), a naturally occurring parasite of *Arabidopsis thaliana*, to study the molecular basis of plant diseases and immunity. John's group, in collaboration with **Brett Tyler**, professor in PPWS and the Virginia Bioinformatics Institute, has been involved in a multinational collaboration to sequence the genome of *Hpa*. Analysis of the *Hpa* genome revealed adaptations that enable the pathogen to go into “stealth mode” inside the plant and avoid activating defense responses.

This work was published in the journal “Science.” The full article, “Signatures of adaptation to obligate biotrophy in the *Hyaloperonospora arabidopsidis* genome,” can be found at www.sciencemag.org/content/330/6010/1549.full.

The McDowell lab is following up on this research with additional molecular studies to better understand how oomycetes can cause disease. In addition, they are testing a new approach based on genome information to screen for new plant disease resistance genes that can be bred into crops.



*Ph.D. candidate Ryan Anderson's (McDowell lab) image of the downy mildew pathogen (*Hpa*) sporulating on an *Arabidopsis* seedling was featured on the cover of the December 2010 issue of “Science.”*