

POSIES & PATHOGENS



Department of Botany and Plant Pathology

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Twentieth Edition

May 2009

FROM THE DEPARTMENTAL CHAIRPERSON

With this edition of "Posies and Pathogens" we mark the 20th year of our newsletter distributed to all members of our extended family. This year has certainly been a year of transition (or some might say "turmoil") for the Department! Dr. Dan Arp (now Dean Arp) has stepped down as Head/Chair of the Department and has taken on the position of Dean of the Honor's College. Dan did an absolutely outstanding job for four years at the helm of our ship. We are grateful for his friendship, leadership and vision and we are especially fortunate that Dan is still a member of our Department; he and his team continue to conduct research activities on the fourth floor of Cordley.

Another monumental change in the Department was the departure of Itsue Pfund after twenty-five years of service to BPP. As many of you know, Itsue was the caretaker of the "books" and she knew more of the history of these details than perhaps all of us combined. Itsue joined the Department of Crop and Soil Science as their Fiscal Manager and they are extremely fortunate to have Itsue as part of their team. It shouldn't go without noting that there were those in the Department that knew of Itsue's imminent departure and did not share this with me until I hit the button to submit my application (I think you can see the obvious reasons!). We cannot adequately express how grateful we are to Itsue for her dedication to the Department and for taking such good care of all of us over so many years. We miss Itsue's friendship, smile, and presence in the Department!

So, the Department has gained a new Head/Chair and a new Fiscal Manager. Our new Fiscal Manager is Steven Hoelscher. It took us

some time to find the "right fit" for BPP, but finally in late November, Steve joined the BPP family and is adjusting wonderfully well to his new position. Steve comes to us from a career in industry, a very different environment than OSU. Despite the steep learning curve due to such different fiscal systems, Steve has clearly risen to the occasion and successfully mastered the complexity of a joint Department in relative short order.

Oh, did I happen to mention that we also have a new Grants and Contracts person, LeAnne Rutland? LeAnne, who previously worked for Team Oregon, takes good care to make sure we are not overspending on our grants. She is a great addition to BPP and we are very fortunate to have her as part of our fiscal team.

Ok, so now you can see it has been a year of "great fun" within the Department, but I believe we have made it over these tough hurdles in good shape. However, this certainly would not have been the case if it weren't for the rest of the office team (Dianne, Blaine, Katie and Sue); each stepped up to the plate without complaint! Through all of this, the faculty, students, and research staff has been very patient and giving of their time!

Despite these disruptions, our students, faculty, research associates and assistants continue to flourish and make us proud! They continue to publish high-profile manuscripts in prestigious journals, are honored as recipients of awards here on campus and throughout the US, garner research funds that continue to expand our grants and contracts portfolio, and just make it fun interacting with each other on a daily basis!

I won't spend time recapping the information in the following pages, but just want to make a few special comments. We lost two valued friends this

year. Dr. Lew Roth passed away on September 24, 2008 at the age of 94. Lew will always be remembered as a friend to BPP and for "inspiration and leadership of a generation of plant pathology students and colleagues". Ms. Anita Summers passed away July 22, 2008 at the age of 86. Together with the late John Niederhauser, Anita established the "Anita Summers Graduate Student Travel Fund" in BPP and she was always a dedicated friend to BPP and to the University. We miss these wonderful individuals!

Dr. Jim Carrington was elected to the prestigious National Academy of Sciences. This honor was certainly well-deserved and a proud moment for Jim, his family, and for the Department! Congratulations Jim!

This year marks the 100th year birthday of our Department as "Botany and Plant Pathology". We will be celebrating this event in the fall (October) and hope that many of you will be able to make it back "home". In addition, because the Annual APS Meeting is in Portland this year, we welcome all our friends and alumni to join us in August for a picnic. Please see details of these events below.

With the current fiscal situation both on campus, throughout the US and beyond, I know many of

you are facing what we here in Oregon are finding to be quite a challenge. At this time we are not sure how the current budget cuts will affect the University or BPP. I do know that we all must try to keep a positive attitude and look for "silver linings" if at all possible. We wish those of you going through similar difficulties a "soft landing". Please take the time to enjoy life and those people and activities that help to relieve the stresses of difficult times. We look forward to hearing from all our friends of the Department and hope some of you will be able to join us following the APS Meetings or in October.

Warm regards,



Lynda M. Ciuffetti
Professor and Chairperson
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OSU Botany and Plant Pathology Alumni Picnic

The Department of Botany and Plant Pathology is hosting an alumni picnic in Corvallis on the evening of **August 5, 2009**—the final day of the APS annual meeting in Portland. All alumni are also invited to attend the 100th Anniversary Celebration of Botany and Plant Pathology at OSU, which will be held **October 8, 2009**. Information on both events will be available at www.science.oregonstate.edu/bpp/news.htm or by contacting **Chris Mundt**, Department of Botany and Plant Pathology, 2082 Cordley Hall, OSU, Corvallis, OR 97331-2902 U.S.A.; phone: +1.541.737.5256; fax: +1.541.737.3573; e-mail: mundtc@science.oregonstate.edu.

WELCOME NEW FACULTY



Pankaj Jaiswal joined the department in August 2008 as Assistant Professor. He earned his PhD from Lucknow University, India. Prior to coming to the OSU, he was a Senior Research Associate at Cornell University's Plant Breeding Department, where he developed the first rice metabolic Pathway database called RiceCyc. He is a Co-Principal Investigator on the National Science Foundation (NSF) funded Gramene database project on comparative plant genomics. In February 2009 he received the National Science Foundation award on the Plant Ontology Database to create a controlled vocabulary of plant anatomical and morphological structures and growth and developmental stages that are applicable to all plants. Another aspect of his research is to create gene to gene network interactomes of agronomically

important cereal crop plants and grasses. Pankaj is joined by his wife Dr. Sushma Naithani, an Assistant Professor (Senior Research) in the Horticulture Department at OSU, and their two sons, Rohan and Aroonim. They look forward to their future here in Oregon.



Bo Ming Wu joined the department in March 2009 as Assistant Professor to work at the Central Oregon Agricultural Research Center. He received his Master's degree from China Agricultural University and Doctoral degree from the University of California, Davis. His research areas include identification, characterization and control of diseases impacting vegetable, field and specialty crops, including alfalfa, wheat, grass, carrot, garlic, onion, potato, mint and others. He is interested in conducting biological and epidemiological studies aimed at improving our understanding of disease epidemics. The ultimate goal is to develop and implement disease management strategies minimizing the use of chemicals and increasing productivity and sustainability.

FACULTY NEWS

This past year, **Mike Behrenfeld's** lab has been involved in a wide range of field, laboratory, and satellite modeling activities. They participated on research cruises in the North Atlantic and the Mediterranean, with research focused on relationships between planktonic properties and optics. A primary focus of their laboratory work has been investigating impacts of nutrient stress on algal photosynthesis and carbon metabolism. A new paper resulting from this work should soon be published and describes a new Z-scheme for plant primary production. Satellite work this year began with the analysis of global ocean chlorophyll fluorescence data. This work led the first demonstration of these remote sensing products as a sensitive new tool for detecting iron limited phytoplankton in the global ocean. It also provided the first observational evidence that large regions of the Indian ocean are seasonally limited by iron. Satellite data was used to re-evaluate the Sverdrup Critical Depth Hypothesis, which has served as a cornerstone concept in aquatic sciences explaining the occurrence of spring blooms in phytoplankton. With the new satellite analysis, they demonstrated that the half-century old Sverdrup Hypothesis is incorrect and they proposed a new hypothesis in its place, called the Grand Dilution Hypothesis, that describes how physical processes interfere with food chain interactions and allow phytoplankton to seasonally bloom.

Len Coop continues to deliver weather-driven insect and plant disease models via the web, develops epidemiological tools for the NPDN (National Plant Diagnostics Network), publishes the online PNW Insect and Weed Control Handbooks, and works with **Bill Pfender** on a model for grass seed stem rust, and with **Jeff Stone** on Swiss Needlecast models.

Another busy year in **John Fowler's** lab; they are in the second year of a NSF five year collaborative study with the Carnegie Institution on the campus of Stanford University, Iowa State University and South Dakota State University on the genomics of male and female gametophytes, primarily in maize. Part of



this large-scale project is creating a public website, which is available at www.maizegametophyte.org. A good portion of our spring, summer and fall is devoted to planting, crossing and harvesting our plants at the BPP Field Lab. After harvest comes seed screening and selection – never ending tasks. Since last summer, the lab has manually examined over half a million maize kernels for particular color and spotting patterns. They are happy to have an army of excellent undergraduate students (**Sierra Wolfenbarger, Taulun Aman, Beth McClaran, Taylor Hulse, Matthew Stratton and Anatoliy Vlasenko**) to help us with these important tasks! In February and March, **Rex Cole**

(Postdoctoral Research Associate) and **Zuzana Vejlupkova** (FRA) traveled to Molokai Island, HI, to cross maize plants grown from their seed selections. The Molokai harvest will arrive in April, and the screening cycle will continue, just in time for summer planting at the field lab. Rex Cole also continues his cell biological work on the role of the Exocyst in Plant Morphogenesis. Last summer, Rex mentored Emily Harvey, a Corvallis High School student, on an "Apprenticeships in Science and Engineering" (ASE) summer project. Emily presented her work on root growth and the exocyst in Arabidopsis at the ASE Conference in Portland last August. Summer 2008 was the final field season for our EPA-funded "Variation in Pollen Competitive Ability in Diverse Maize Lines" on the genetic basis for pollen fitness, to predict whether certain plant cultivars or genotypes pose a high risk for gene flow via pollen. John Fowler, Zuzana Vejlupkova and long-time undergraduate lab assistants - **Sierra Wolfenbarger, Luisa Snyder, Nathan Snyder and Steven Ma** - worked hard in the field and lab to finish these experiments.

Zuzana has one remaining set of microarray experiments on pollen from various maize lines. **Lol Cooper** (Postdoctoral Research Associate) joined the lab in July to quantify pollen gene expression using real-time PCR, and is working to validate earlier microarray results. **Lukas Synek**, a Postdoctoral Research Associate from Dr. Viktor Zarsky's laboratory (Institute of Experimental Botany, Prague, in the Czech Republic) visited the lab in June as part of our collaboration with the Zarsky research team.

John Fowler gave an invited talk at the October Frontiers of Sexual Plant Reproduction meeting in Tucson, AZ, and also attended the 51st Annual Maize Genetics Conference in March 2009.

Maria Ivanchenko, Research Associate in the group with USDA support, authored three papers, and has two more coming out soon! She presented a BPP department seminar in April. Luisa Snyder received a 2008 summer HHMI fellowship for "Testing the Role of Conserved Genes in Pollen Development", and Nathan Snyder completed his research on *rop* genes in maize pollen. Luisa and Nathan have now graduated, and both will start in Dental school in 2009. The lab wishes them luck, and will miss them both!



Greetings from **David Gent's** lab! The past year has been busy with travel, increased sampling and field research in Oregon and Washington, and a new graduate student—**Joanna Woods**—beginning in the fall. David participated in an EPPO Pest Risk Analysis for *Xanthomonas axonopodis* pv. *allii* in Paris in August. Imagine four days of meetings with the Eiffel tower just out the window...quite a tough week of work! He also began a three year sentence as senior editor of *Phytopathology* in January. The long awaited *Compendium of Hop Diseases and Pests*, edited by **Walt Mahaffee**, **Sarah Pethybridge**, and **David Gent**, is now available for pre-publication order from APS Press. The process of shepherding the compendium from an idea (Walt's and Sarah's idea...) to publication has taken five years. Please order a copy for your collection.

Nearly 19 years have passed since **Phil Hamm** moved from campus to establish a new plant pathology program and diagnostic laboratory dealing with high value irrigated agriculture in Hermiston (North Central Oregon). With the fifteen years working within the BPP in Corvallis, only Dianne Simpson and Everett Hansen have worked longer. He is glad he started when he was 10! Given the nature of plant pathogens, there is never a dull moment. Potatoes are "blessed" with significant and numerous diseases and his program most recently has focused primarily in that crop (and several diseases...fungal and viral) though they did have a significant effort in grass seed, sweet corn, and onions as well. This past year they built a large "screen house" using grant funds to allow "field" studies with several new viruses in potatoes. This situation allowed the opportunity to study these viruses in a field like situation without the complicating insects that transmit and move these problems. They obtained remarkable results. Phil recently finished a three year term as senior editor of the American Journal of Potato Research (Plant Pathology) and continues to serve that society as a member of the Board of Directors. He also serves as the Superintendent of the **Hermiston Agricultural Research & Extension Center** where he is housed, and in his spare time he also enjoys serving on the local school board, and board of directors of the Hermiston Chamber of Commerce. Their facility will be celebrating 100 years of commitment and accomplishment in serving agriculture in the region on 30 June, 2009. Please feel free to come join them that day.

Aaron Liston travelled to Miami, Florida in March, 2009 for a meeting of the NSF-funded Gymnosperm "Assembling the Tree of Life" collaboration. He also spent a day collecting pine specimens in southern Florida, with his current PhD student **Matthew Parks**, and BPP alum **David Gernandt** (1998 PhD with **Jeff Stone**).

It has been another year of change with the Foliar Pathology Lab with **Walt Mahaffee**, Andy Albrecht, **Dani Martin**, Tara Neil, **Patricia Wallace**. They continued to expand their research efforts in wine grapes with projects on detection and quantification of *Erysiphe necator* in vineyards to time fungicide applications (with Gary Grove, WSU), timing of leaf defoliation for powdery mildew and Botrytis management (with Patty Skinkis, Horticulture), effects of temperature on sporulation of *E. necator*, and biocontrol of botrytis bunch rot. They are finishing up their work on the epidemiology and population genetics of blackberry rust (with **Ken Johnson** and **Nik Grunwald**, and Don Gomez and Kathy Evans in Australia). They continue to collaborate with the Weather System Workgroup (**Len Coop**, Chris Daly, **Dave Gent**, Paul Jepson, **Bill Pfender**, Alan Fox (FoxWeather, LLC), Doug Gubler, Carla Thomas (UC

Davis), Gary Grove, and Dennis Johnson (WSU)). They said goodbye to **Amy Peetz**, who took a job with Inga Zasada at USDA-HCRU, and hired **Dani Martin**, who just graduated from **Jeff Stone's** group.

Bruce McCune returned from sabbatical this year, having completed a new edition of *Macrolichens of the Pacific Northwest* (OSU Press, to appear Spring 2009). He and coauthor Linda Geiser added 117 species to the second edition, many of these new to science since the first edition in 1997. Our understanding of the macrolichens of the Pacific Northwest advanced tremendously in the ten years since the first edition. The Survey-and-Manage program of the U.S. Forest Service and Bureau of Land Management stimulated much research and many exciting advances in lichen ecology and systematics. Bruce's graduate students and their research projects contributed many of those advances. Bruce currently has four graduated students (**Martin Hutten**, **Heather Lintz**, **Peter Nelson**, and **Heather Root**) and a postdoc (**Sarah Jovan**) working on projects funded by the National Park Service, the U.S. Forest Service, and the Bureau of Land Management. Field action this year will take them to Alaska, California, and Oregon.

The **McEvoy lab ('McLab')** continues research on the ecology and biological control of invasive plant species. In September 2008, **Peter** and his wife Esther travelled to Brisbane, Australia to celebrate the wedding of his former PhD student **Shon Schooler**, who recently was granted tenure at the Australian research organization CSIRO. Peter was back on the road in February 2009 to Christchurch, New Zealand for the International Symposium on Biological Control of Arthropods. He stopped off in Auckland on the way home to visit his former post doc **Zhi-Qiang Zhang**, now an Acarologist at Landcare Research and founder/editor-in-chief of *Zootaxa*, a journal for zoological taxonomists. **Don Campanella** will be defending his PhD thesis in May 2009 on multiple control organisms on multiple biotypes of skeleton weed (under the direction of co-major professors **Chris Mundt** and **Peter McEvoy**). **Fritzi Grevstad** and **Paolo Sanguaneko** are using the new quarantine facility in Richardson Hall at OSU to screen insects for biological control of gorse and knotweeds. **Klaas Vrieling** visited the lab from Leiden University in the Netherlands July-August 2008 to collaborate on a study of the role of parasitoids and disease in explaining patterns of host plant use by the cinnabar moth. **Dr. Russell Messing** of University of Hawai'i spent his sabbatical year with the lab in 2008-2009 developing an appropriate regulatory framework for biological control, and he will be returning to Oregon for the summer 2009. **Eric Coombs** of the Oregon Department of Agriculture continues his close association with the lab; he is undertaking an update of biological weed control programs in the USA for the World Catalogue: Biological Control Organisms for Weeds. Peter recently co-organized a successful meeting of western and southern regional CSREES projects on Biological Control in IPM Systems held in Portland in conjunction with the 6th International IPM Symposium.

A ¼-acre laissez-faire native plant garden distracts **Kathy Merrifield** from evaluating citizens' soil and plant samples for plant-parasitic nematodes. The *Fraxinus latifolia*-*Alnus rubra*-*Salix hookeriana* canopy is closing over a riparian shrub understory. Upland and streamside herbaceous highlights include *Mimulus cardinalis*, *M. dentatus*, *Zauchneria californica*, *Sedum spathulifolium*, three *Sidalcea* species, and *Erythronium oregonum*. *Veratrum viride*, *Caltha leptosepala*, *Calamagrostis canadensis*, and several *Carex* species rule the bog. Due to flooding of this functional bioswale, it also serendipitously illustrates the work of a foliar nematode. A *Heuchera micrantha* collection from the Columbia Gorge displaying exemplary symptoms of *Aphelenchoides fragariae*, along with an asymptomatic collection of *Cryptogramma arostichoides* which was loaded with the little suckers, has resulted in a large-scale host range trial. Among the more picturesque hosts are *Boykinia elata* and a *Habenaria* species. Colonization by *A. fragariae* has not discernibly affected the configuration or vigor of any of its hosts, the stained-glass window symptoms are highly attractive, and the parasites are nice to have for classes.

Richard Halse co-authored a new book with **LaRea Dennis Johnston**, "Aquatic and Wetland Plants of Oregon" published in 2008 by Uncial Press, Aloha, OR.

The **Oregon Flora Project**, coordinated by **Linda Hardison** has accomplished another milestone with the April 2009 release of its Photo Gallery at their website, <http://oregonflora.org>. 2,680—more than half the species that occur in Oregon—are represented in ~16,500 images of Oregon plants. Field photos, along with location information and links to the Oregon Plant Atlas are displayed. The gallery also has herbarium specimen images of 2,300 different species; this is a valuable service for researchers at other institutions. Other work happening at the OFP includes preparation of the final steps needed for the Checklist. This represents the framework for the entire Flora Project, and details the nomenclature for all Oregon plants. They also continue to add data to the Oregon Plant Atlas—it's now at over 530,000

mappable points! The team has grown recently with the addition of **Dr. Barbara Wilson** and the **Carex Working Group**. They are contributing their expertise in grasses and sedges to prepare these segments for the *Flora of Oregon*. The OFP benefits from the regular volunteerism of **Gene Newcomb** and **Jeff Cook**, and have several undergraduate student workers to keep them making progress. Their marvelous long-time staffers of **Thea Cook**, **Jennifer Sackinger**, and **Katie Mitchell** continue to help, with Katie working remotely from Illinois.

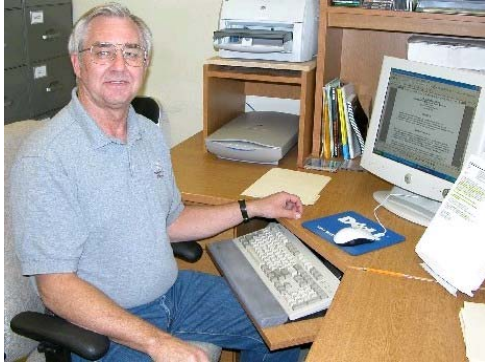
Olivia Duren, MS student with **Pat Muir**, will defend her thesis this spring term. She's learned all sorts of surprising things about chaparral in SW Oregon (*Arctostaphylos viscida*, *Ceanothus cuneatus*), particularly about the age structure of populations. Hint – they often aren't even-aged, which is the typical condition in CA! **Laurie Gilligan**, another MS student with Pat, is working up her data on structure of oak stands in SW Oregon – a characteristic feature of that landscape but little understood. Are they even or multi-aged? Dominated by single-stemmed individuals or multi-stemmed plants? What does their structure tell us about their disturbance history – and about how they might best be managed? Stay tuned! And Pat herself has recently resumed **Directorship of the Environmental Sciences Undergraduate Program**, a position that she stepped down from in 2002, but is looking forward to resuming!

Bill Pfender's group at the USDA-ARS National Forage Seed Lab are continuing to work on epidemiology of stem rust in the grass seed crop, but have also started a new research project in host resistance to this pathogen. In the epidemiology work, they are evaluating and improving the simulation model that is used in their interactive fungicide decision aid on the website created in cooperation with **Len Coop** (<http://pnwpest.org/cgi-bin/stemrust1.pl>). They are working with Len, **Dave Gent**, **Walt Mahaffee** and others to develop and test protocols for creating high-resolution weather estimates to run disease models. **Tyler Gordon** is a new graduate student in their lab, having begun in March 2009. His M.S. research project will focus on overwinter survival of the stem rust pathogen as affected by environmental conditions and antagonistic microbes. In the host resistance work they have demonstrated specificity in the pathosystem, and have developed a mapping population for stem rust resistance in perennial ryegrass. They will be conducting QTL analysis for resistance traits using bulked and single-pustule isolates.

The **OSU Plant Clinic** is in its 55th year of operation, and continues to provide diagnostic resources for growers of Oregon, surrounding states, and other states across the county (17 other states in 2008). There were a few personnel changes in 2008. **Marilyn Miller** re-retired in December. Marilyn had come out of retirement in 2002 to work on diseases due to the bacterial pathogens *Agrobacterium tumefaciens* and *Rhodococcus fascians*, and they benefited from her expertise as she worked part-time as a Senior Faculty Research Assistant. Apparently the lure of life in Paris was too great, and Marilyn has decided to spend more time with her husband and family there. **Marc Curtis** joined the Plant Clinic in 2008 as a part-time Research Associate. He designs and implements new molecular assays, troubleshoots PCR diagnostics of microbial pathogens, and is working with **Maryna Serdani** in developing a Loop-Mediated Isothermal Amplification (LAMP) assay as a diagnostic tool for detecting *Rhodococcus fascians*. Maryna is a full time Senior Faculty Research Assistant who is the right hand of Chief Diagnostician and lab director **Melodie Putnam**. Last April, **Sue Jepson** launched the new monthly highlights series at http://www.science.oregonstate.edu/bpp/Plant_Clinic/year.htm. Please visit the calendar and see some of the plant problems you might want to look out for each month.

Jay Pscheidt is waiting. Waiting for the next *Plant Disease Management Handbook* (55th) to come out of the printers, two new students to arrive, and the budget axe to fall. Plenty of committee work to do while he is waiting. At least travel to the four corners of the state is over – Ontario, Gold Beach, Astoria and Prosser with Mt Vernon thrown in for good measure. OK, so those last two were not in Oregon but topics ranged from fungicide, tree fruit and blueberry diseases and master gardener training. Jay had a great summer class last year with 9 students who now know everything about diagnosing plant problems in the field. Just ask them anything, like what their favorite cookie was! Projects continue on fungicide testing, eastern filbert blight and a new one on black walnut decline otherwise duded thousand cancer disease. But he still has two great FRAs, **Steve Cluskey** and **John Bassinette**, who help make it all happen not to mention the entire plant pathology extension faculty who are so good to work with. Did you see their latest web site? You can now get a Certificate of *Phytophthora* mastery from OSU and pesticide recertification credits for the low price of \$100! Seriously, have a look at: <http://oregonstate.edu/instruct/dce/phytophthora/>

Teresa Sawyer, the **Electron Microscope Facility Manager**, reports that the EM Facility has gone through a transformation in the last year. Last fall, the prior scanning electron microscope (SEM) went to a new home where it became a supplier of parts. The laboratory was renovated to accommodate two new SEM's. These are very impressive instruments. The FEI Dual Beam 3DFEG microscope was installed just after the New Year. In addition to imaging, the tool has the ability to mill into specimens revealing a cross section, creating a Transmission Electron Microscope sample and collecting X-ray data. The FEI Quanta 600 FEG was installed in February. This SEM is used primarily for Low Vacuum and Environmental (wet) imaging. This microscope also has High Vacuum and X-ray capabilities. The Philips CM12 Transmission Electron Microscope is still available. Replacement for this microscope is in the funding process. Currently the Electron Microscope Facility is open Monday, Wednesday and Friday. Please stop by for a tour, imaging or both.



Richard Smiley's field crops pathology program at the **Columbia Basin Agricultural Research Center** at Pendleton, continues to focus on the biology and control of plant-pathogenic fungi and plant-parasitic nematodes. This work is closely coordinated with complementary programs in Idaho, Washington, Australia, China, France, Syria and Turkey. Their emphasis is currently focused upon developing wheat varieties with resistance and tolerance to root-lesion nematodes, cereal cyst nematodes and Fusarium crown rot. They are characterizing resistance genes and developing molecular markers to track these resistances in seedlings through work locally and through dissertation research by two Ph.D. students at Washington State University. They are also

developing real-time molecular diagnostic procedures to improve the capabilities of commercial nematode diagnostic laboratories. During the past year Richard was honored to serve as a plenary speaker at the Rovira Rhizosphere Symposium in Adelaide, South Australia. He also continues to serve on the External Advisory Board for the European Network for the Durable Exploitation of Crop Protection Strategies (ENDURE), a center of excellence program featuring a collaboration of 16 national and international agencies and institutes in 10 member states of the European Union. Photos and current information regarding their program, staff and publications may be found at <http://cbarc.aes.oregonstate.edu/cbarc/plantpathologyhome.php>

After two years of experiments in the orchard and lab at the **Southern Oregon Research and Extension Center** in Central Point, **David Sugar** has developed new procedures to accelerate the ripening process in pears, and consumers could be able to bite into fresh, sweet Comice and Bosc pears earlier than usual if growers implement these new ripening techniques. Reported in *OSU This Week* in June 2008, David has found that by briefly storing Comice pears at cool temperatures and applying ethylene gas to them, they could land in supermarkets by early September instead of the usual early October. With an even simpler version of that ripening treatment, Bosc pears could also be in shoppers' carts in early September, instead of two weeks later. Under ideal conditions, this means that Labor Day picnics could include fruit salads made with flavorful Bosc and juicy, buttery Comice pears. For producers, this would extend their marketing season and hopefully allow them to bring in more revenue. In January 2009, David was the invited opening speaker at a Postharvest Working Group meeting sponsored by the European Commission on Science and Technology in Faro, Portugal. David's presentation was titled: "Advances in practical management of pear ripening capacity and postharvest decay."

The OSU Insect ID Clinic continues to occupy **James Young's** time with approximately 400 specimens, 250 email inquiries and 180 phone calls during 2008. With support from the College of Agriculture James began offering Honey Bee Diagnostic Services in March and conducted a Honey Bee survey to determine the need for additional services. James will be working with the newly hired Apiculturist, Ramesh Sagili (Dept. of Horticulture), conducting a Honey Bee Pest & Pathogen Census in 2009. James was also an organizer for the Oregon Entomological Society's first ID workshop on Dragonflies. The workshop was held on campus in March and was attended by OSU Faculty, local high school students, and Master Gardeners from as far away as Bend and Coos Bay. James also received approval from the OSU extension service to create ~90 extension fact sheets over the next 5 years on insects and arthropods that are of interest to public and is also preparing a new course (Pollination Biology) that is being offered Spring of 2009.

Don Zobel taught a colloquium for the Honors College about ecology and environmental problems in the Himalaya in Spring 2008, spent a few days refreshing markers on permanent plots near Mount St. Helens, and continued analysis and writing of data already on hand. (Don spends some time in the office most days while he is in Corvallis.) Travels include trips to Morocco and the Caribbean and visits to family.

MEANWHILE DOWN ON THE FARM...

Greetings from the farm,

The 2009 season is coming on fast. With a new season we have a few new changes. At the tail end of the 2008 season we were able, with the help from Energy Trust of Oregon and the DOE, to install a computerized water system for the outside acreage. The system will allow us to monitor pressure and set the pump for night time watering. The new system will greatly benefit those needing disease plots wet for longer periods.

The new chemical storage facility is finally in the works. The new facility will be located on the old footprint of the West screen house adjacent to the wash pad. We have county approval and are waiting for bids to start construction. Our estimated completion date is mid-June. As expected we are excited about facilities that will make our jobs safer and better serve the farm users.

In March we were able to complete an overhaul of the dock (stinky) room. With new walls, lights, floor treatment, and shelving we are able to offer that space for lab/work space instead of storage.

With these economic times, we are very appreciative of the support from Lynda Ciuffetti and the department.

As always we try to serve the users to the best of our ability.

Have a great 2009!

*by Aaron Henderson
Botany and Plant Pathology Field Lab*

FROM A FORMER CHAIRPERSON

It seems quite impossible that it is April again---but by the time this arrives in your mailbox, we will most likely have a new dean appointed in the College of Agricultural Sciences who will replace Dean Thayne R. Dutson who retired in June 2008 and I will be working directly for that individual in my capacity as associate dean. I've had the educational opportunity to serve on the search committee for his replacement and after we interviewed five candidates for three days each (two on and one off campus), I didn't have to wonder what happened to the month of February. It is good to know that Oregon State University is so attractive to senior administrators. And after almost a year of pinch hitting, it will be wonderful to have a full complement in the Deans' office again.

This year marks the official 100 years of the Department of Botany and Plant Pathology. Many of you will be in Portland in August for the 2009 annual meeting of the American Phytopathological Society and may have the opportunity to visit Corvallis after that meeting. Dr. Robert Zeigler (M.S. with Don Zobel) received the OSU College of Agricultural Sciences Alumni Leadership Award last October, but was unable to come at that time. We anticipate that Bob will be joining us in Corvallis either before or after the APS meeting to receive that award.

Our family has had another full year with a mixture of celebration and loss. Our dear family friend, Anita S. Summers, departed our physical lives in July. My children and grandchildren join Jim and I in missing her and my garden feels unattended with her passing. She did, however, live to welcome our third grandchild, Coakley Anna Lewis, born in June to our oldest daughter Sarah and her husband Charles. The unique name was given by Charles who purportedly won the naming rights in some trivial bet. In mid- August, Jim and I had the good fortune to visit Martha in Namibia, Africa for three weeks during a time that she was on winter break from her teaching. She met us in Windhoek and travelled with us for the duration---to a coastal resort town of Swakopmund (German), to a lodge near Cape Cross fur seal colony, inland to a variety of incredible ancient rock strewn areas. Over miles and miles of dusty gravel roads that varied from a safe 60 km/hr to creeping over in gullies. It was late winter when we visited and the country was desolate and reflective of a very dry climate where there are more sand dunes and barren land than anything else. It is hard to imagine it as it is now---with early summer rains, Martha described it as a "green jungle." We have hundreds of pictures to document the travel---a stark and poor country with its own beauty of very friendly and gracious natives. We ended our travels (which included a self-drive safari through Etosha National Park---with thousands of springbok, hundreds of zebras, and dozens of giraffe and many other species) by staying with Martha at the school in Tsintsabis where she

lived and experiencing a real sense of where and how she lived. Remarkable. We had the good fortune to have her return with us to Windhoek (Peace Corps required all the volunteers to come in for periodic "training") and we enjoyed picking up one of her colleagues and his visiting sister as they started their "hike" (= finding a ride, i.e. hitch hiking) from the town that has been Martha's shopping locale each week (requiring a 60 Km hike weekly) towards Windhoek (4 hours away). To everyone's delight, Martha came home to stay on January 6th and we were able to whisk her, her sisters and their families off for a vacation on Maui. We thoroughly enjoyed having the ten of us together for a much needed change of pace.

If you come to campus, please let me know. My office phone remains (541-737-5264) and my e-mail: stella.coakley@oregonstate.edu. Hopefully, I'll have a chance to see many of you in the year ahead. I wish the best to you all during this time of great economic challenges around the globe.

by Stella Melugin Coakley

2009 FOOD DRIVE

The Food Drive at Oregon State University (<http://oregonstate.edu/events/fooddrive/>) has a long tradition of success. Every year during the month of February the University community comes together and plans a wide variety of food and fund-raising activities to help the hungry. This effort is in conjunction with the Governor's State Employees Food Drive. The resources gathered by county Extension offices, Experiment Stations, Cascades Campus and Centers associated with OSU go to their local food banks. Proceeds from the OSU Corvallis campus benefit the non-profit agencies served by Linn-Benton Food Share. These agencies include local food pantries, soup kitchens, emergency shelters, day care centers, shelter homes, and gleaning groups in Linn and Benton counties.

This year Botany and Plant Pathology placed second in our size category at OSU (for 51-100 employees) and 5th among all 69 contributing units at OSU. We collected \$4,086 in direct cash contributions, \$840 in payroll deductions, and 85 lbs of food. Using the conversion of \$1 = 5 lbs of food, this totals to a contribution of 24,715 lbs of food. This boils down to 2.5 times the amount contributed in the previous best year we had a record of for BPP (which was 2007). The most important number, however, is that our contributions will provide about 70 lbs of food for each day of the coming year to those who are struggling to get by.

OSU as a whole also set an all-time record for contributions, raising more than 485,000 pounds of food.

by Chris Mundt and Dianne Simpson (2009 Department Food Drive Coordinators)

UNDERGRADUATE STUDENT NEWS

Congratulations to the following students who received a B.S. in Botany in academic year 2008/2009:

**Caitlin Henden
Morgan Curtis
Pat Caldwell
Sarah Aulerich**

**Heather Cruise
Therese Biboux
Malcolm Anderson**

Congratulations to our Honor Roll Students Spring and/or Fall terms 2008, and/or Winter 2009:

**Malcolm Anderson
Jamie Coggins
Eric Conley
Morgan Curtis
Charity Deatherage
Thomas 'Wade' Holman**

**Katrina Isch
Andrew Johnson
Julia McGonigle
Stephanie Vandruff
Zakariah Weinstein
Christina Wessler**

GRADUATE STUDENT NEWS

The BPP-Graduate Student Association (GSA) Committee would like to thank **Lynda Ciuffetti** and the rest of the BPP department for making 2008 a smoothly running year, despite all of the faculty changes.

The BPP-GSA is a student-run organization that works to strengthen the graduate student community and voice within the University. The BPP-GSA is comprised of all of the BPP graduate students; they meet once a term to discuss upcoming events, concerns and ideas that involve the department. This year's committee members are **Sierra Hartney** (president), **Ebba Peterson** (vice president), **Patti Wallace** (treasurer) and **Clare Elliott** (marketing guru). With their enthusiasm and organization skills they successfully planned the graduate student's beach weekend, Fall Discovery Days, pre-seminar coffees, BPP merchandise, and assisted with the department's recruitment weekend.

BPP Beach Weekend provides incoming and returning graduate students the opportunity to socialize and become acquainted before the term begins. This year's event welcomed over 20 attendees. The students enjoyed beautiful weather allowing for romps on the beach and in the woods. And as always the attendees left with smiles and full bellies as Friday night's potluck and Saturday's feast of fresh mushrooms and crab provided more than enough food for all.

Discovery Days is an essential biannual event put on by the University's science departments. Children of all ages, from public, private



and home taught schools, attend to be engaged by the many realms of science. The BPP booth took up two sides of the room exhibiting aspects of botany, mycology and plant pathology. Many graduate students and faculty took part in this event, volunteering to either create displays or work hour-long shifts. A big thanks to **Jay Pscheidt** (and his apple pickers) for his Apple Scab display and video.

Sierra Hartney and **Ebba Peterson** designed the new BPP logo and **Ryan Kepler** designed the novelty t-shirt, AC/GT—Highway to Gel. Merchandise is currently available in the BPP office with both logos on t-shirts and the BPP logo on tote bags, each item is just \$10. Proceeds from fundraising go towards annual BPP-GSA travel

grants of \$200 each, awarded to individuals who participate in BPP sponsored events. Watch out for the pre-order sale where you can order the BPP logo on hoodies, long sleeve tees and children's clothing. Also coming soon will be pint glasses featuring barley and apple scab.

The BPP recruitment weekend was a success again this year and thanks go to all who volunteered to show the prospective graduate students around. Hopefully we didn't put them off with our ambitious road trip to the elusive "Valley of the Giants" which we never did find!

Recipients of the BPP-GSA 2008 travel grants were: **Olivia Duren**, **Sam Fox**, **Sierra Hartney**, **Cedar Hesse**, **Ryan Kepler**, **Stephen Meyers** and **Pek Wijayratne**.

Don Campanella (Mundt and McEvoy labs) published a paper in Biological Control titled "Interaction effects of two biological control organisms on resistant and susceptible weed biotypes of *Chondrilla juncea* in western North America". He also presented a poster at the Botany 2008: Botany without Borders conference in Vancouver, BC titled "Genetic equilibrium of *Taraxacum*-type apomixes in autonomous triploid lineages".

Olivia Duren (Muir lab) received a travel grant from the Ecological Society of America Applied Ecology Section to present a poster in Milwaukee, WI titled "Chaparral age structure as a clue to disturbance regimes and vegetation community change in Southwest Oregon". She also attended the Association for Fire Ecology meeting held in San Diego.

Sam Fox (Mockler lab) wrote a book chapter about transcriptome sequencing using high throughput sequencing technologies that will be published in March 2009. He also attended the New Phytologist meeting in September.



Mushroom hunting at the beach



Crab feast at the beach

Sierra Hartney (Loper lab) presented a poster at the 2008 American Phytopathological Society centennial meeting titled "Bioinformatic analysis of TonB dependent receptors: the start of the pathway". She received the Anita Summers and the BPP-GSA travel grants to offset the cost of attending.

Ryan Kepler (Spatafora lab) spent July and August collecting *Cordyceps* and related fungi in Japan. During this time he also performed microscopic investigations on these fungi at the National Museum of Nature and Science in Tsukuba, Japan. He is also spotlighted as a co-author on the paper "Systematics and evolution of the genus *Torrubiella* (Hypocreales, Ascomycota)" with BPP alumna **Desire Johnson** in the Journal of Mycological Research.

Heather Lintz (McCune lab) won the Oregon Scholarship Fund Award from the State of Oregon.

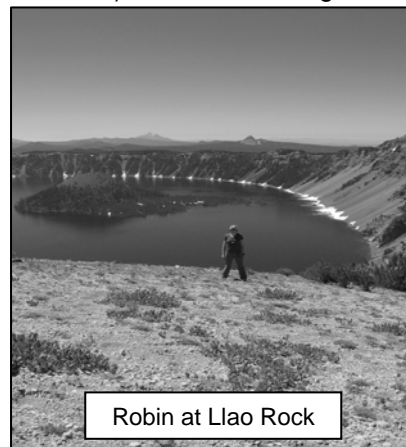
Danielle Martin (Stone lab) gratefully graduated and is now employed at the USDA-ARS-HCRU in Walt Mahaffee's lab where she is working with powdery mildew of grapes. She presented her thesis work on foliar and stem canker of Port Orford cedar at the Western International Forest Disease Work Conference (WIFDWIC) in Missoula, MT; this included a presentation and a poster. Her thesis chapters will be included in the WIFDWIC proceedings.



Cleaning mushrooms at the beach

Robin Mulvey (Hansen lab) will be continuing her research on White pine blister rust and its alternative hosts this year at Crater Lake National Park. We are all jealous of her field work!

Matt Parks (Liston lab) gave an oral



Robin at Llao Rock

presentation on his lab's assembly methodology for Illumina short read sequence data at the Gymnosperm Tree of Life Annual Meeting in Miami, FL. He also gave a talk titled "Phylogenetic Analysis of *Pinus* Based on 33 Chloroplast Genomes" at the Botany 2008: Botany without Borders conference in Vancouver, BC. He presented his poster titled "Applying Multiplexed Solexa Sequencing and a Novel Assembly Protocol to Increase Phylogenetic Resolving Power" at the UCSD Next-Generation Sequencing and Informatics Symposium. This was also presented at the OSU CGRB Fall Conference. He also presented a poster at the recruitment weekend poster symposium titled "Plastid Phylogenomics Using the Illumina 1G Genome Analyzer".

Ian Pfingsten (Kaye and Wilson lab) worked with the Institute for Applied Ecology and the Grant County Public Utility District on a population viability analysis of *Artemisia campestris* var. *wormskioldii* in the Columbia River Basin of Beverly, WA.

Patti Wallace (Mahaffee lab) was granted another year's open call access to the DOE, Pacific Northwest National Laboratory- Environmental Molecular Sciences Laboratory in Richland, WA to use several of their microscopes. She presented her work on bacterial biofilms and biological control at the 2009 Biology Graduate Student Symposium held in Newport, OR and she also attended the 2008 American Phytopathological Society centennial meeting held in Minneapolis, MN.

by Clare Elliot, Sierra Hartney, and Patricia Wallace (GSA Officers)

RECENT THESIS TITLES

Aaron Smith (MS Hansen)

Biology of chlamydospores of *Phytophthora ramorum*.

Amanda Hardman (MS McCune)

Terrestrial lichen and bryophyte communities of the Blue Mountains in northeastern Oregon.

Jason Alexander (PhD Liston)

A taxonomic revision of *Astragalus mokiensis* and allied taxa within the *Astragalus lentiginosus* complex of Section *Diphysi*.

Jessica Brunson (MS Pyke)

Yield responses of invasive grasses to carbon doses.

Ian Silvernail (MS Meinke)

Serpentine and non-serpentine edaphic ecology and the recovery of *Lomatium cookii* (Apiaceae), an endangered endemic of southwest Oregon.

Sunny Lucas (MS Parke)

Susceptibility of coast redwood seedlings to *Phytophthora ramorum*.

Bradley Collins (MS Parke)

The effects of *Phytophthora ramorum* infection on hydraulic conductivity and tylosis formation in Tanoak sapwood.

Brian Knaus (PhD Liston)

A fistful of *Astragalus*: Phenotypic and genotypic basis of the most taxon rich species in the North American flora.

Danielle Martin (MS Stone)

Developing techniques for evaluating the susceptibility of root-disease resistant Port orford cedar to foliar and stem canker diseases.

Yu-Ping Liu (PhD Dolja)

Generation of full length cDNA and functional analysis of leader proteases of grapevine leafroll associated virus-2.

AWARDS, HONORS AND PROMOTIONS**Faculty**

OSU Phi Kappa Phi Emerging Scholar Award – **Todd Mockler**

Carter Award for Outstanding and Inspirational Teaching of Graduate Students (Finalist) – **Dr. Jeff Chang**

College of Science Outstanding Faculty Research Assistant Award - **Viola Manning**

Dr. James Carrington elected to National Academy of Sciences

Fellow of the American Association for the Advancement of Science - **Dr. Joyce Loper**

Students

Charity Deatherage received the 2009 **Thomas C. Moore Memorial Scholarship**

Charity Deatherage received the 2009 **Charles and Helen Fulton Memorial Award**

Malcolm Anderson and **Charity Deatherage** received 2009 **Katherine R. Pamplin Scholarships** from the **Portland Garden Club**

Matthew Groberg received the 2009 **Ernest and Pauline Jaworski Fund for Underserved Undergraduates in Plant Science**

Elizabeth Martin received the 2009 award from the **Moldenke Fund for Plant Systematics** and the **Bonnie C. Templeton Award for Plant Systematics Research**

Robin Mulvey received the 2009 **Hardman Award for Native Plant Research**

Patricia Wallace received the 2009 **Larry Moore Award for Graduate Plant Pathology**

Pallavi Phatale won a **GSA Poster Award** and a **Young Investigator Award** at the 25th Fungal Genetics Conference

Matthew Parks was awarded the April 2009 **Anita S. Summers Graduate Student Travel Award**

Pallavi Phatale was awarded the December 2008 **Anita S. Summers Graduate Student Travel Award**

Steven Meyers received the 2008 award from the **Leslie and Vera Gottlieb Research Fund in Plant Evolutionary Biology**

Brian Knaus received the **George R. Cooley Award** from the **American Society of Plant Taxonomists** at the Botany 2008 Meeting

IN MEMORIUM

Lew Roth from *Phytopathology News* 2009, 43:15

Lewis F. Roth, 94, professor emeritus in the Department of Botany and Plant Pathology at Oregon State University passed away on September 24, 2008, in Albany, OR.

Roth was born in Poplar, MT, on the Sioux-Assiniboine Indian Reservation. His dad was an agricultural advisor for the Bureau of Indian Affairs. The family moved to Oxford, OH, where he attended Miami University, graduating with a B.A. degree in botany. Roth then enrolled at the

University of Wisconsin, where he earned his Ph.D. degree. In 1940, he was hired at Oregon State University as a mycologist and plant pathologist. He



continued there until his retirement in 1979 and remained active in an emeritus role until very recently.

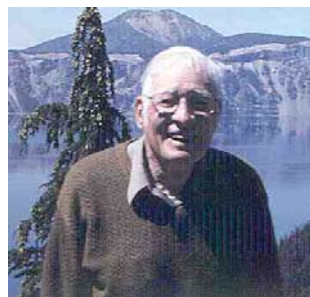
In 1942, he enlisted in the Navy and spent 3 years as division officer and paymaster on the escort aircraft carrier CARD. After release from active duty, he continued with the Office of Naval Research and retired after 22 years with the rank of commander. In 1945, he married Evelyn (Lyn) Swaim. They had two daughters. Swaim became a close colleague in much of Roth's work. He was particularly fond of the memory of Swaim's contributions to his mistletoe research at the Pringle Falls Lewis F. Roth Experimental Forest. They were trying to trap the sticky mistletoe seeds as they were forcibly discharged from the plants, but the seeds just bounced off of the targets Swaim was holding up as traps. The seeds were caught very efficiently in Swaim's hair, however. Not only did the marriage survive the subsequent painful combing, but Roth realized that the resilient needles of trees were the natural landing place for mistletoe seeds, not rigid branches and boles. Roth believed that successful management of disease in the forest relied first and foremost on foresters using the tools of silviculture and forest harvest. Roth's goal in teaching was to instill forestry students and professionals with the necessary knowledge of pathogen biology and ecology, allowing them to establish and maintain healthy, productive forests.

His Ph.D. thesis research, with A. J. Riker, explored the interactions between soil environment, *Pythium* and *Rhizoctonia*, and pine seedlings and led to one of the early demonstrations of effective biological control of damping-off disease. He and his graduate students demonstrated the systemic colonization of ponderosa pine by *Elytroderma*, thus explaining the recurrent nature of pine needle

Anita Summers from *Corvallis Gazette Times* 7/24/2008

Anita S. Summers, 86, of Corvallis died July 22, 2008 at Park Place Assisted Living Residence. Born Aug. 30, 1921, in Eugene, she was the only child of Jasper and Ermine Bonnett Simons. After graduation from the University of Oregon where she earned her bachelor's degree in economics, Anita moved to the Bay Area, where she met and married Herb Summers. The couple moved to Sacramento, where Herb worked in education. A serious automobile accident experienced early in their marriage left both Herb and Anita with many physical challenges. Despite these challenges, Anita was

cast epidemics. They clarified the infection biology and measured the impacts of several tree decay fungi. Roth and his students elucidated the growth and behavior of two invasive *Phytophthora* species and, with Forest Service silviculturalists and university ecologists, established the basis for successful management of cedar root rot. Roth worked with company foresters and graduate students to understand *Armillaria* root rot in ponderosa pine and then applied the information in large-scale



demonstrations of management techniques. Similarly, with his students and Forest Service research silviculturalists, he worked out the dynamics of dwarf mistletoe seed dispersal and

infection of ponderosa pine. This led to one of the first epidemiological models in forest pathology and to practical recommendations for growing pine in the presence of mistletoe.

Roth was elected fellow of The American Phytopathological Society in 1980 and, in 2000, was corecipient of the first Outstanding Achievement Award from the Western International Forest Disease Work Conference (WIFDWC). He was cited for "Pioneering work on *Phytophthora lateralis*, *Armillaria*, and dwarf mistletoe, and for inspiration and leadership of a generation of plant pathology students and colleagues." In 2005, Forest Service colleagues dedicated the Lewis Roth Dwarf Mistletoe Trail on the Deschutes National Forest to commemorate and continue Roth's contributions to public understanding and appreciation of mistletoe.

a staunch supporter of education on all levels, and especially concerned with the education of young people. She was a member of the League of Women Voters and also very involved in women's issues.

When Herb and Anita decided to return to Oregon, they were torn between moving to Corvallis or Eugene as Herb was an OSU alumnus and Anita was a University of Oregon alumna. Ultimately, OSU won out and



Photo by Dennis Wolverton

the couple made their home in Corvallis. Anita had an extremely positive outlook and was very personable. She also possessed a wonderful sense of humor—as evidenced when she accepted an Honorary Alumni Award from Oregon State. In her acceptance speech she said, “I have good news and bad news: the bad news is ... I’m a Duck; the good news is ... I was smart enough to marry a Beaver!”

Preceded in death by her beloved husband, Herb, and her parents. Anita will be remembered by her many friends for her keen intellect and her unwavering support of education and women’s issues.

THANK YOU DONORS

The following individuals and organizations generously supported the Department with donations received between March 2008 and March 2009. Those who wish to remain confidential are not listed.

Edward R Alverson and Angela R. Ruzicka
James and Deanna Anderson
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Ronald J TyrI
Elaine Urban
Joan and George Weir
Susan M. Wick
Barbara L. Wilson
Barry and Ella May Wulff
Stanford and Susan Young

ALUMNI NEWS

Robert Zeigler (MS 1978 with Don Zobel), Director General of the International Rice Research Institute (IRRI) in the Philippines was elected Fellow of the AAAS in 2008.

Joseph D. Gilbuena (BS 2002) received his Doctorate of Optometry at Pacific University, Forest Grove in May 2008

John Thilenius (PhD 1964 with William Chilcote) died May 9, 2008 in Juneau, Alaska at age 77.

SCHOLARSHIPS AND AWARDS MADE POSSIBLE BY OUR ENDOWMENTS

The **Department of Botany and Plant Pathology** is fortunate in the support it receives from alumni, friends, and other organizations. Through the OSU Foundation, we have established named funds and endowments in honor, or, in memory, of friends, alumni, and faculty. The growth of these funds enables us to enhance support for our students and programs.

Botany and Plant Pathology Endowment Fund in Honor and Memory of Alumni and Friends holds smaller endowments that have been established in honor and in memory of particular individuals so we can reach the minimum amount required for an individual fund (as required by the OSU Foundation) more rapidly and benefit from the potential earning power of these gifts. Once a particular fund reaches the endowment level it will be moved into a separate account. The **Donald J. Armstrong Fund, Dallice I. Mills Seminar Fund, Mary L. Powelson Fund, Alfred H. Soeldner Fund, Donald B. Zobel Fund, William Chilcote Memorial Fund, Harold Evans Memorial Fund, MacSwan Memorial Fund, F. McWhorter Memorial Fund, E. Otto Memorial Fund, Mark T. Patterson Fund, Harry K. Phinney Memorial Fund**, and the **James Sandeno Memorial Fund**, are all held within this larger fund. Awards are periodically made in the individual's name for the purpose associated with the original gift.

Charles and Helen Fulton Memorial Endowment provides scholarships for botany majors and undergraduate research projects in botany.

Leslie and Vera Gottlieb Research Fund in Plant Evolutionary Biology provides funds to graduate students to support both laboratory and field research in the evolutionary biology of plants native to western North America: including evolutionary and population genetics, systematics and phylogenetic studies, comparative analyses of development, and physiological and biochemical studies of plant adaptations.

Bonnie Hall Student Activity Fund supports group activities for undergraduate and graduate students.

Hardman Award for Native Plant Research supports graduate student research concerning the native plants of Oregon.

The Ernest and Pauline Jaworski Fund for Summer Research Experiences for Underserved Undergraduates in Plant Science is offered for undergraduate research during summer term. The goal of this program is to increase the level of diversity among students who enter Ph.D. programs to pursue careers in university teaching and research by providing research opportunities to undergraduates that have been underserved.

Bill and LaRea Johnston Endowment supports undergraduate education and is used either to directly support students or their research efforts, or teaching activities on behalf of these students. The ***Outstanding Senior Award*** is also made possible by this endowment.

Georgia Mason Herbarium Fund provides funds for a student worker to participate in the day-to-day operating activities of the Herbarium and its programs.

Moldenke Fund for Plant Systematics supports graduate student travel to herbaria to study preserved plants, and travel to field sites to collect specimens for plant systematics research.

Larry Moore Award for Graduate Education in Plant Pathology supports graduate student education in plant pathology.

Thomas C. Moore Memorial Scholarship assists undergraduate students in botany and plant pathology.

Portland Garden Club Katherine R. Pamplin Fellowships are offered for research in aspects of native plant biology, rare and endangered plant conservation and environmental effects on native plants.

Jean Siddall Memorial Scholarship supports undergraduate students studying rare and endangered plants.

Anita Summers Graduate Student Travel Fund supports travel of graduate students within the area of Botany and Plant Pathology for attendance at professional meetings where the recipient has a specific responsibility such as presenting a poster or paper, or participating in a discussion as an invited participant.

The Dr. Bonnie C. Templeton Endowment supports graduate student research in systematics.



Oregon State
UNIVERSITY

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Thanks are due to **Sue Jepson** for collecting the information, layout, editing and handling the mailing list; **Dianne Simpson** for proof reading; **Tom Allen** for the logo and **Ken Chambers** for the name.



CONTRIBUTIONS may be sent to **The Oregon State University Foundation, 850 SW 35th Street, Corvallis, OR 97333**

I'm making a gift of \$_____ to **Botany and Plant Pathology** and would like to direct it to the following:

- Where need is greatest
- Student support (research and travel)
- Bonnie B. Hall Student Activity Fund
- Bill and LaRea Johnston Fund for Undergraduate Education
- Oregon Flora Endowment
- Bonnie C. Templeton Endowment Fund
- Larry Moore Endowment Fund
- Thomas C. Moore Memorial Endowment
- Posies and Pathogens Newsletter
- Anita Summers Graduate Student Travel Fund
- Leslie and Vera Gottlieb Research Fund in Plant Evolutionary Biology
- Botany and Plant Pathology Endowment in Honor and Memory of Alumni and Friends in name of _____

Name _____

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THANK YOU FOR YOUR SUPPORT