POSIES & PATHOGENS

Department of Botany and Plant Pathology
2082 Cordley Hall, Corvallis, OR 97331-2902 Phone:541-737-3451 Fax: 541-737-3573
http://bpp.oregonstate.edu/

Twenty Fourth Edition December 2015

FROM THE DEPARTMENT HEAD

Dear Alumni and Friends,

With this edition of *"Posies and Pathogens"* we mark the 24th edition of our newsletter for all members of BPP and our extended family. It is a special opportunity to keep in touch with all of you and I hope this correspondence finds you and yours well.

I know you will enjoy the selection of activities and accomplishments provided here. A few highlights include our very special tribute to our long-time leader Dr. Stella Melugin Coakley. Stella retired as Associate Dean of the College of Agricultural Sciences on March 1, 2015, but continues in the Deans Office working on special projects. Dean Arp provided a wonderful dedication highlighting Stella's exceptional contributions. I hope you will enjoy the recognition of Dr. Richard Smiley who retired January 1, 2015, but many will not be surprised that Dick continues to carry on his research under Emeritus status. Our longtime colleague Dr. Joyce Loper has recently accepted the position of Associate Dean in the College of Agricultural Sciences and we are absolutely thrilled that Joyce will move from Professor (Courtesy) to Professor in BPP. Last but certainly not least, I know you will enjoy the overview of the *"Flora of Oregon"*, first to be released in a three-volume series.

We have had the good fortune to welcome Dr. Jared LeBoldus who joined the Department as an Assistant Professor in September 2015. Jared is a forest pathologist with a joint appointment in BPP and Forest Engineering Resources and Management. As a reminder, last year we introduced Dr. Jeff Anderson in anticipation of his arrival to BPP as an Assistant Professor for our new plant-microbe interactions position. We are very pleased to say that Jeff and his family did arrive spring 2015. Please welcome Jared, Jeff, and their families to BPP and OSU.

While we use our newsletter to acknowledge various informational items over the past year it is impossible to share with you all the wonderful accomplishments of our students, faculty, research staff, and office staff. They continue to thrive and make contributions to the success of the department each and every day! It is impossible to express all they do but I hope you take the opportunity to visit our website. To gain a flavor of these accomplishments, I invite you to look regularly at the changing "News" spot on our front page; I just love this component on our website as it continuously reminds me why I am so very proud of and fortunate to serve such a wonderful and talented group individuals. Also please visit "Meet Our Alumni", "Events", and "Award Winners", as I know you will also enjoy these sections and in doing so you will be able to keep up with our department throughout the year.

Sadly, I convey the passing of our dear friends and colleagues Drs. Duane Coyier, Jack Horner, Harold Jensen, and Bob Powelson. Enclosed are personal tributes to each of these very special individuals. Our hearts go out to their families.

As always we are extremely grateful for the gifts of so many and all that is made possible through

these generous donations. We love hearing from our extended family and invite you to visit us when you find the opportunity to do so. I wish all of you a very peaceful Holiday Season with family and friends and a happy and healthy New Year. Warm regards,

Lynda M. Ciuffetti
Professor and Department Head,
ciuffetL@science.oregonstate.edu

WELCOME NEW FACULTY

Jared LeBoldus joined the Department of Botany and Plant Pathology in September as an Assistant Professor in Forest Pathology jointly with Forest Engineering Resources and Management. Dr. LeBoldus is a productive, experienced, and skilled scientist who will not only compliment and develop long-lasting collaborations with forest scientists in the College of Forestry and with the Oregon forest industry but will also add to OSU's growing cohort of faculty with bioinformatics skills. He also has previous extension experience where he developed an outstanding record of outreach to agriculturists, land managers, and the general public. He comes to OSU having previously taught courses in plant pathology, forest pathology and landscape pathology and we have no doubt he will have great success in the classroom.

FACULTY NEWS

Joey Spatafora began his sabbatical in September at the laboratory of Francis Martin at INRA-Nancy. INRA is the French equivalent of the USDA and he is based there just outside of Nancy. Host, Francis Martin, is Head of Lab of Excellence ARBRE UMR "Tree-Microbe Interactions". His lab works on mycorrhizae and fungal-plant interactions and one of the World leaders in comparative and functional genomics of fungi and in particular mycorrhizae. They have collaborated for a few years the big goal for this sabbatical is to produce the first big 1000 Fungal Genomes Project (1KFG) paper. He is also learning some new techniques associated with the setup and design of microcosms for mycorrhizal synthesis and RNA-Seq experiments and looking forward to bringing this technique back to the lab at OSU in April. The photo is of a *Boletus edulis*, or cepes as they are called in France, that was collected for a delicious dinner!

Jay Pscheidt Extension duties continue from the PNW Plant Disease Management Handbook to pest management guides. The research program grows with projects on the overwintering of fruit rot pathogens. Graduate student **Jade Florence,** working on the biology of the mummy berry pathogen, should be finishing up her thesis fall 2015. Postdoctoral Scholar **Lisa Jones** is working on understanding the biology of *Botrytis* sclerotial development in red raspberry canes. New graduate student **Lauri Lutes** will be starting a cherry virus survey in 2016. Faculty research assistants **John Bassinette** and **Stephanie Heckert** make much of the field work happen. John keeps the woody perennials programs (apples, cherries, blueberries, pears, and many ornamentals) moving well at the Botany and Plant Pathology farm. Stephanie has major projects with hazelnuts from eastern filbert blight to kernel mold. Numerous projects keeps them both very busy but their hard work is very much appreciated.

Two recent M.S. recipients in **Bruce McCune's** lab, **Nijmah Ali** and **Kaleigh Spickerman**, completed their degrees and have taken jobs, Nijmah teaching at Butte College in California and Kaleigh doing field

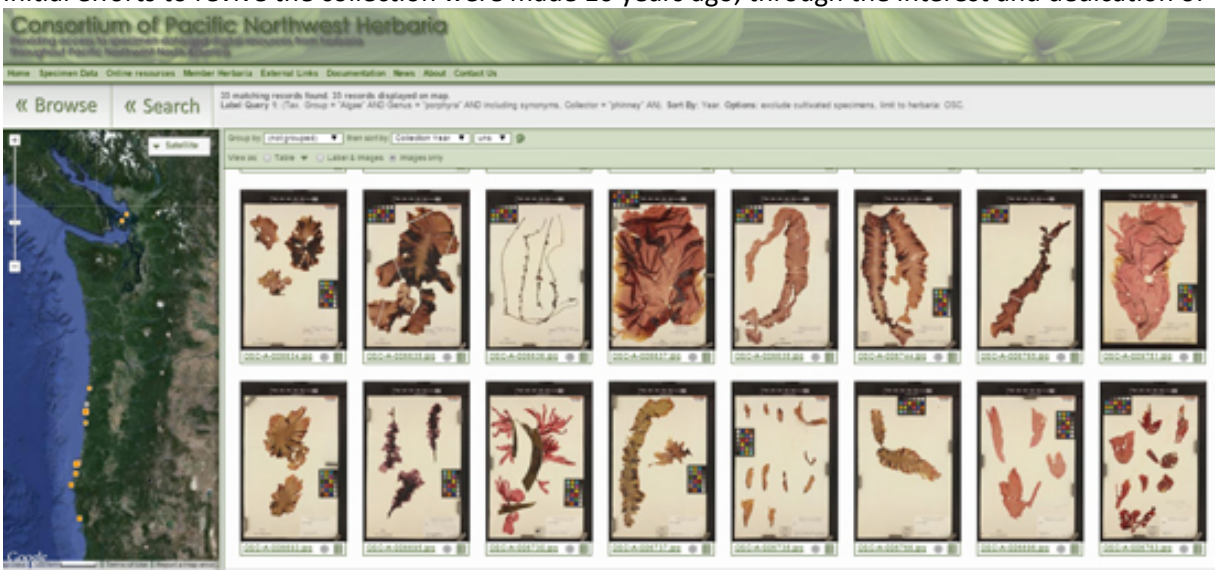
botany for the BLM out of Klamath Falls. Both worked on ecological projects with lichens in Alaska. New student **Abby Glauser** is leading a data entry team for an NSF-funded project to enhance our lichen herbarium. Specifically, we are incorporating over 100,000 specimens collected as part of the Forest Service's Forest Inventory and Analysis Program across all western states. The collections will be available in a newly expanded herbarium, as well as an online database. This project is led by Aaron Liston, with Bruce McCune and Joey Spatafora as co-PIs, with Ben Legler from University of Washington taking a critical role as database guru. Current PhD student **Rob Smith** continues our studies of lichen and bryophyte distribution in relation to climate in the Pacific NW and Minnesota. This is an exciting Year 1 for a unique climate change experiment in northern Minnesota (see photo). OSU, with support from the Forest Service, under an organization led by the Oak Ridge National Laboratories, is contributing lichen studies to the massive experimental installation of controlled climate chambers and bog heaters. We hope to learn how many components of the ecosystem will respond to increased temperatures and CO_2 (see [story in Nature at http://www.nature.com/news/minnesota-bog-study-turns-up-the-heat-on-peat-1.18235](http://www.nature.com/news/minnesota-bog-study-turns-up-the-heat-on-peat-1.18235)).

Photo: Oblique aerial view of the Marcel SPRUCE project in northern Minnesota, April 2015. Each enclosure is 12 meters in diameter, 8 meters tall, and extends about 2 meters below the peatland surface. Photo courtesy of Oak Ridge National Labs.

The **Dolja** and **Fowler labs** have recently collaborated on research that has enabled them to discover the mechanism behind cytoplasmic streaming in plants. **Valera Peremyslov, Rex Cole, John Fowler** and **Valerian Dolja** are the first to identify the machinery that runs this process. This prominent feature of plant cell biology, a textbook staple, has been described over 200 years ago, but it was not clear how the process works. Cytoplasmic streaming is known in other organisms, such as animals and fungi but this group is the first to uncover the process in plants.

Aaron Liston, Director of the Oregon State University Herbarium has had recent support from the National Science Foundation enabling thousands of seaweed specimens to be viewed online. Seaweeds are often beautiful organisms, and now 12,000 specimens from the Oregon State University Herbarium algae collection are viewable online, with the support of the National Science Foundation. The OSU collection comprises approximately 15,000 specimens of marine and freshwater algae. The marine algae (seaweeds) are mounted on sheets, and most of these have been imaged and databased. The freshwater algae are stored in packets, and these will be databased in the coming year. The OSU collection includes 1800 specimens recently transferred from the Portland State University Herbarium, and imaged as part of this project.

Specimens in the collection date from 1871 to 2004. However, the majority of the collections were made between 1947-1980 by **Harry K. Phinney**, his wife **Grace Scharf Phinney**, and many of his students. After Phinney's retirement in 1983, the collection was infrequently used and mostly forgotten. Initial efforts to revive the collection were made 10 years ago, through the interest and dedication of



Talia Sanfilippo, an OSU student. In 2012, the OSU Herbarium joined 48 other collections to create a national Macroalgal Herbarium Consortium Portal. This effort was awarded an NSF grant in 2013, and over 300,000 algal specimens from 35 institutions are now available at macroalgae.org. The OSU algae imaging and databasing has been conducted over the past year by two talented and hard-working undergraduates, Heaven Roberts and Kali Woodard, with bioinformatics and technical support from Ben Legler at the University of Washington Herbarium and Burke Museum. The OSU specimen data is also available via the Consortium of Pacific Northwest Herbaria www.pnwherbaria.org/data/search.php.

Cindy Ocamb has been concerned about the continuing spread of black leg disease of brassicas. With severe infections last year in crucifer seed crops, she finds that infected crop residues were a source for persistence and subsequent spread in the Willamette Valley. As reported in the *Capital Press* and the *Plant Disease Management Handbook*, the causal fungus can infect a range of cruciferous crops including broccoli, cabbage, canola, mustard, and radish. Black leg will start its appearance in brassicas in the late fall: canola, cabbage, kale, and turnip are all very susceptible. Organically-produced crucifer crops are especially vulnerable. Disease is spread by wind-blown ascospores releasing from infectious crop residues on the soil surface that can infect volunteer brassicas. Sustained rain events result in widespread ascospore release that will cause leaf spots during November. Symptoms include roundish, gray spots on cotyledons, leaves, stems or petioles, with black dots (pycnidia) on the surface, stem lesions, and root

rot. Seed crops can become infected from inoculum splashed onto seed pods. During rainy weather infection can spread very rapidly in a few weeks. Even with good management, it may take some time to get this disease under control.

The Gramene project (www.gramene.org) (supported by NSF) team associated with **Pankaj Jaiswal's** lab is pleased to announce its release #48b highlighting the new version of Plant Reactome database (supported by the Human Reactome award, Ontario Research Fund and EBI Industry Programme) (http://plantreactome.gramene.org/). In this release the Plant Reactome database has expanded gene homology-based pathway projections to 58 plant species. Notable newly projected species include wild ancestors of peanut, common bean (*Phaseolus*), chickpea, pigeonpea, cacao, *Brassica oleracea*, capsicum pepper, sweet orange, coffee, cotton, grape, date palm, *Triticum turgidum* (wheat BB), basal angiosperm *Amborella*, the gymnosperms Norway spruce and Loblolly pine, lower plants *Physcomitrella* and *Selaginella*, and green algae *Chlamydomonas*, to name a few. In addition, they have added two new hormone signaling pathways from rice for salicylic acid and jasmonic acid and revised three previously curated pathways for salicylic acid biosynthesis, Brassinosteroid signaling and Strigolactone signaling. The Plant Reactome database continues to provide a tutorial, search and browse pathways, reactions, compounds and gene products, data analysis tools, advanced search features and programmatic access to data.

It has just been announced that **Joyce Loper** will be the next Associate Dean in the College of Agricultural Sciences. Joyce currently serves as research plant pathologist at the USDA ARS Horticultural Crops Research Unit (HCRU) in Corvallis. Joyce's many leadership positions have included Research Leader at the HCRU, Research Leader (Acting) at the USDA ARS Forage Seed and Cereal Research Unit in Corvallis and Assistant Director (Acting) for the Pacific West Area, USDA-ARS unit in Albany, CA. Joyce is a Professor (Courtesy) in the Department of Botany and Plant Pathology. Her research interests include genomics of plant-associated bacteria, microbial ecology, biological control of plant disease and secondary metabolism. Joyce has a distinguished record of service and scholarship and has published over 100 peer-reviewed publications. She will begin her duties in the College on May 2, 2016, replacing Associate Dean Larry Curtis who is retiring.

The Oregon Flora Project

The Oregon Flora Project (www.oregonflora.org) is pleased to announce that the illustrated Volume 1 of the *Flora of Oregon* is now available! Volume 1 of the 3-volume set covers the ferns and fern allies, gymnosperms, and monocots--23% (1,054 taxa) of all native and naturalized vascular plants of our state. Each taxon description is accompanied by a distribution dot map, and there are pen and ink

illustrations of 521 taxa, including 86 new works by artist John Myers.

There are five introductory chapters. The "Ecology of Oregon" chapter describes the state's 11 ecoregions and predominant habitats. A complementary chapter describes 50 sites--organized by ecoregion--to explore; these are accompanied by 73 beautiful color photographs. Additional chapters address Oregon's botanical history, the history of the Oregon Flora Project, and conventions used within the *Flora of Oregon* series. Appendices emphasize plant taxa of interest to conservationists: rare and endangered species, endemics, taxa limited to a single ecoregion, and those not collected during the previous 50 years.

Valuable to ecologists, land managers, native plant gardeners, and explorers of all stripes, this beautiful book is the first flora for our state in over 50 years.

Specifications: 7.5" x 10.5" hardback, 608 pp., 520+ b/w illustrations, 1000+ distribution maps, 73 natural landscape color photos. $75. Order online at shop.brit.org; copies also available for purchase in 1048 Cordley.

Linda Hardison

RETIREMENTS

Stella Melugin Coakley

How much of an impact can one person have? If

that person is Stella Coakley, the impact can be huge. It's difficult to capture all that Stella has done for the University, the College of Agricultural Sciences, and the Department of Botany and Plant Pathology over the past three decades. But a good place to start is to look at the current group of professors in Botany and Plant Pathology. Stella has had a hand in hiring most of the group, either in her role as Department Head or as the Associate Dean with responsibility for the Department. That group of faculty has propelled the Department to one of the consistently most productive departments on campus from the standpoint of research productivity. Stella understood the importance of hiring quality people as a starting place. But she also understood that you need to create an environment where those faculty can be successful. Throughout her career, she remained a champion for improvements in faculty lives. Her mantra, "What can we add that will make your jobs better, and what roadblocks can we remove?" That support of people was of course by no means limited to faculty. She also showed strong support of the graduate and undergraduate students, research and office staff, and others who made up the BPP community.

Stella has also been a remarkable champion for infrastructure improvements over the past three decades. It's easy to focus on the 'needs' of Cordley Hall, and while those needs remain significant, they would be even greater without Stella's constant attention over the years. Some of my colleagues will remember the re-plumbing project that improved water pipes in the department. Many more laboratories now have air-conditioning because of Stella's commitment. And each of those faculty members hired under Stella's watch has a remodeled laboratory to work in. Stella has been equally effective at the college level, building partnerships to accomplish projects that many thought were just not possible. (I don't think 'impossible' is in Stella's vocabulary. 'Improbable' perhaps, but improbable projects just provided encouragement for Stella!)

Stella has always understood that a successful department is not a siloed department. She recognized the importance of BPP having a teaching role in the Biology program. She encouraged her faculty to participate in interdisciplinary programs. And she fostered collaborative research projects across department and college boundaries. Stella also reached beyond the University to engage friends and stakeholders of BPP and the College. Students are the primary beneficiaries of her outreach through the scholarships those friends of BPP have made available.

If one looks to shared governance at OSU, you see another world in which Stella has had a huge impact. For one who has spent her entire career at OSU in administrative roles, she nonetheless understood the importance of the faculty voice in helping to steer the University. Most apparent in shared governance was her stint as Faculty Senate President. Less obvious was her constant and (sometimes) behind the scenes encouragement of others to get involved in shared governance.

These are a few examples of the impact Stella has had during her three decades at OSU. She has made an indelible mark on BPP, the College, and the University. Indeed, one person can have an amazing impact!

By Dan Arp

Richard Smiley

After serving the State of Oregon and Oregon State University as a Professor of Plant Pathology, Dr. Richard W. Smiley retired effective January 1, 2015.

Dick Smiley grew up on dryland wheat and barley farms in California. He earned a B.S. degree in soil science at California State Polytechnic University (1965), an M.S. degree in soils (1969), and a Ph. D. degree in plant pathology (1972) at Washington State University. He was an assistant research soil scientist in the USDA/ARS at Pullman from 1966 to 1969.

One of Dick's first publications, "Use and Abuse of the Soil pH Measurement," greatly influenced the way that plant pathologists measure soil pH. His early studies established the principal that soilborne pathogens favored by ammonium are the same as those favored by acid soils and that those favored by nitrate are the same as those favored by alkaline soils.

As a NATO postdoctoral fellow and research officer with CSIRO-Soils Division at Adelaide, Australia, Dick studied the influence of rhizosphere pH on the ecology of fluorescent pseudomonads (a group of bacteria often associated with biological control of plant pathogens) antagonistic to the root-pathogenic fungus responsible for take-all decline in cereals (*Gaeumannomyces graminis* var, *tritici*). His work demonstrated that the suppressive effect of the slight acidification of the rhizosphere in response to ammonium uptake by roots was due to biological suppression by the antibiotic producing fluorescent pseudomonads. This research provided the first clear evidence for the potential of fluorescent pseudomonads as biocontrol agents of root pathogens in the rhizosphere.

Dick served as a research associate (1973-74) in plant pathology for Cornell University at Long Island and as an assistant professor (1975-80) and associate professor (1980-85) in plant pathology at Cornell in Ithaca. There he researched the etiology and control of root-infecting pathogens of turfgrasses and wheat. His contributions led to the discovery of two pathogens.

Dick joined Oregon State University in 1985 as a Professor in the Department of Botany and Plant Pathology and as the superintendent (until 2000) of the university's Columbia Basin Agricultural Research Center near Pendleton. Since arriving in Oregon his research has encompassed the etiology and control of field crop diseases, with emphasis on integration of applied management strategies to reduce damage from wheat and barley diseases caused by soilborne plant-pathogenic fungi and plant-parasitic nematodes. He has also maintained a robust Extension program, keeping growers informed of the latest research on cereal disease and their management. Major outcomes from his program include the following.

Rhizoctonia root rot causes extensive damage to wheat and barley planted annually. Growers killed weeds and volunteers by applying a herbicide several days before planting the next crop. The herbicides weaken plants making them more susceptible to infection by the pathogen. Dick discovered that extending the time interval between herbicide application and planting date could result in as much as a doubling of grain yield. This principal became known as the "Green Bridge".

A disease known as physiological leaf spot causes foliar symptoms very similar to symptoms caused by fungi in the genera *Septoria* and *Pyrenophora*. Dick demonstrated that fungicides were ineffective against physiological leaf spot and that misdiagnosis of the disease in the field resulted in ineffective applications of fungicides on very large tracts of land. He also documented

that crop losses could be avoided by applying chloride fertilizer to soil or plants. Growers now apply chloride to improve grain yield and the disease name was recently changed to "chloride-deficient leaf spot".

Fusarium crown rot is a chronic disease of winter wheat in the Pacific Northwest. Early research focused upon the role of *Fusarium culmorum* but Dick noted that *F. pseudograminearum* and *Bipolaris sorokiniana* were also common in Oregon. He surveyed wheat fields in Oregon and Washington and found that the dominant pathogen region-wide was *F. pseudograminearum*. The dominant pathogen in individual fields varied across years as well as geographic regions. He also reported that spring wheat planted into conservation farming systems was also heavily damaged. His lab has used DNA-based technologies to distinguish among the pathogenic species and they have screened international collections of wheat and barley to identify germplasm with improved genetic resistance. They have crossed locally adapted wheat varieties with imported wheat lines carrying genes for resistance to improve genetic resistance.

Until 1999, nematodes were not thought to affect yields of broad-acre rainfed small grain crops, particularly in semiarid regions where most of these crops are produced. Dick and others surveyed Oregon and Washington fields and found that 60% contained high populations of root-lesion nematodes. They also found that grain yield could be doubled by applying a nematicide (not registered for commercial use) and could be improved by planting tolerant varieties identified by Dick's research program. This research led to the estimate that lesion nematodes reduce wheat yield in the Pacific Northwest by as much as 5% annually (361,000 metric tons, or $51 million). His program screened international wheat collections to identify germplasm with genetic resistance and crossed these gene donors with locally adapted varieties. His lab is developing molecular markers to identify seedlings that carry resistance genes, and molecular diagnostic procedures to enable commercial soil testing labs to quickly and accurately identify and quantify lesion nematode species. Parallel research has been performed with cereal cyst nematodes, leading to the discovery and reporting of a species previously not reported in North America. Dick's influence is leading to development of varieties that exhibit improved genetic resistance and production efficiency in fields infested by lesion and/or cyst nematodes.

Throughout his career Dick has been a prolific writer completing over 550 publications including journal papers, books, book chapters, other technical and extension articles, and 87 meeting abstracts. He was the senior author on the majority of these publications. He produced the first edition of the *Compendium of Turfgrass Diseases,* was coeditor of the second edition, and contributed to the corn, barley, and wheat compendia.

Dick has served extensively as a reviewer of professional manuscripts for several journals, research proposals for competitive grants, departmental review panels and faculty tenure and/or promotion reviews. He also was a member on several Oregon State University committees.

In addition to his activities at university Dick was very active in the American Phytopathological Society (APS), the International Society for Plant Pathology (ISSP), and the American Society of Agronomy, and was a member of several other professional organizations. He served on numerous committees, and was senior editor and editor-in-chief of APS Press. He served as APS Council representative to ISPP and was selected to serve as APS Pacific Division councilor.

Through his career Dick received several honors and awards including the Briskey Award for Faculty Excellence in the OSU-College of Agricultural Sciences, and Fellow of the American Phytopathological Society.

Dick has been an active participant in the community since moving to Oregon, serving as a member and officer of several community committees.

By Russ Ingham and Chris Mundt

FROM A FORMER CHAIRPERSON/DEPARTMENT HEAD

Where has the year flown to this time? It has been an amazing year of transition for me. All of it good, but also at times, surprising. My transition to retirement has gone well---I passed my associate dean position on to W. Daniel Edge on February 1. Since Edge was a long-term department head in Fisheries and Wildlife (one of my assigned units), it was an easy transition because of his familiarity with our college and our culture. My official retirement date was March 1 and since that time, I've had the luxury of not worrying about personnel and budget matters and it has been a wonderful surprise to not miss being in the thick of such matters. I've had quite a few different special projects since I assumed a ½ time appointment. It has been great to work with our newer faculty and to help them launch their careers at OSU.

This year has allowed me much more time with family and the high point of travel was likely the 2500 mile car trip with our oldest daughter Sarah and her three (almost 3, 5, and 7) to San Diego and back. That was a surprisingly easy trip (books on tape helped) with lots of family visits along the way. Very nice to be able to spend two weeks without worrying about the work piling up at home.

In September, the College's offices moved back to seismically retrofitted Strand Agriculture Hall. They did a great job of rendering a very old building into a quite useful space. I would be happy to tour anyone around the building and point out some of the special features added. One nice touch has been the furniture and paneling that was made out of the redwood tree that was removed in 2012 from outside of Strand due to disease. The building also has a new portico on the Memorial Union side of the building; originally in the design, it was never built. It is now a nice meeting area as well as providing easy accessibility to the building. The building has many pieces from the Art About Agriculture collection which were enlarged and framed to line the walls on first floor. It is fascinating to consider how dramatic some very small pieces have become in their much larger sizes! That was a surprising outcome of the project. My new office is tucked into the 200 Strand Suite (which also houses the Agriculture in the Classroom Foundation). If you come to campus, please let me know ahead if possible---my office phone remains 541-737-5264 and my e-mail: stella.coakley@oregonstate.edu . I enjoy your visits and calls. Wishing you the best for the year ahead.

By Stella Melugin Coakley

UNDERGRADUATE STUDENT NEWS
BPP CLUB

The Botany Club's officer team has worked diligently to provide a wide array of activities for its members. We have expanded our outreach activities, working with elementary school children at Science Nights and in classrooms, as well as fellow college students across campus during times such as Agricultural Day, to teach everyone about the wonders of plants. Outreach activities connect members to our local community, and allow members to share the excitement of one of their favorite subjects through education.

Throughout the year, we take various field trips. This past year, we explored the Mt. Pisgah Mushroom Festival (see photo) and the Glide Wildflower Show. We also visited Opal Creek Ancient Forest Center for an overnight trip, where members stayed in the Jawbone Flats main cabin and toured the area with a guide, taking in the beauty of the majestic Pacific Northwest landscape and examining field specimens in a private classroom. For Spring Break, we explored the flora of Bend, OR, and the surrounding area.

Around campus, Botany Club offers members activities directed towards many interests. Each year, we invite graduate students to present their research to expose members to the wide array of botanical fields, and talk to members about graduate school. We host an annual Fall tree walk with Dr. Aaron Liston, and will be adding a Winter lichen walk with Dr. Bruce McCune, where we explore the diverse flora of our campus with expert faculty members. This year, we will also be using lichens to dye fabric. A Fall tradition that we continue to host is our Apple-Pressing event at the BPP Field Lab. Dr. Ken Johnson

and Todd Temple continue to kindly supply us with a large supply of fresh apples to press and make several gallons of cider with! All of these activities allow our members to connect with each other and their faculty, and experience Botany outside of a classroom setting.

We have been gearing up for our spring Plant and Lip Balm fundraiser event. For this event, we make our own natural lip balm with essential oils and grow plants from seeds and cuttings. Members learn how to propagate and grow horticultural crops. Proceeds support our educational activities around the Pacific Northwest.

As a Club we continue to grow and evolve in an effort to create the most meaningful and engaging experience possible for our members.

By Jeannie Klein, BPP Club President and officers of the BPP Club

CONGRATULATIONS TO THE FOLLOWING STUDENTS WHO RECEIVED A B.S. IN BOTANY 2015:

Emma Buczkowki William Magnus III William Matthews

GRADUATE STUDENT NEWS

The BPP Graduate Student Association is happy to celebrate a hugely successful year, with many academic and extracurricular achievements to report.

By hosting a silent auction at the department's Fall BBQ, the GSA has raised $575 to help fund three grants sponsoring student travel to professional conferences.

This October, we enjoyed our annual Fall Beach Weekend as over 30 graduate students and friends gathered to socialize and appreciate the Oregon coast, becoming better acquainted over live music and a bountiful mushroom hunt.

Outreach

This year, **Andrew Esterson** has led our BUDS program, a graduate student group designed to bolster undergraduate development and success by offering professional workshops and personal mentorships for our BPP underclassmen.

Once again, **Lindsey Theissen** has helped organize BPP participation in Discovery Days, a scientific outreach program offered to students from Corvallis elementary schools.

In November, **Zolton Bair, Dabao Lu,** and **Hannah Rivedal** were invited to lead an educational mushroom hunt at Beazell Memorial Forest. The foray was organized by the Peak Adventure Club, a Corvallis-based group that organizes enriching learning opportunities for elementary school-aged children.

Intramural Participation

For the second year, BPP graduate students have teamed up to represent the department in OSU's intramural volleyball league. Team members **Zolton Bair, Briana Claassen, Kristen Finch, Duncan Kroese, Megan O'Malley, Hannah Rivedal, Tyler Schappe,** and **Javier Tabima** hope to remain undefeated as they compete for the Co-Ed league championship this fall.

This Halloween, **Patrick Bennett** won 1st prize in the "Best Beer" category for his grapefruit-infused Cascadian Dark Ale at the Civil War Brew-Off, an annual brewing competition that is hosted by our Coalition of Graduate Employees.

Academic Achievements

Zolton Bair (major prof Jeff Stone) received a Student Travel Award from the Western International Forest Disease Work Conference to present his research on blister rust resistance in whitebark pine at the 2015 meeting in Newport, OR. Additionally, Zolton travelled to Ashland, OR to present at the 2015 meeting of the Whitebark Pine Ecosystem Foundation.

Patrick Bennett (major prof Jeff Stone) received the Anita Summers Travel Award and a Graduate Student Travel Award, funding travel to present at the 2015 International Union of Forestry Research Organization meeting in Uppsala, Sweden. He also received a student travel award to present at the 2015 WIFDWC meeting in Newport, OR.

Alfredo Diaz Lara (major prof Bob Martin) was awarded an Anita Summers Graduate Student Travel Grant and the 2015 APS Pacific Division Graduate Student Travel Award for his oral presentation on identification of a novel virus involved in raspberry leaf curl disease at the APS Annual Meeting in Pasadena, CA.

Andrew Esterson (major prof Tom Kaye) was awarded the 2015 Katherine Pamplin Scholarship from the Portland Garden Club for his research on plant-soil feedback by an invasive grass, *Brachypodium sylvaticum,* in Douglas-Fir forests. He also received the 2015 Garden Club of America Fellowship in Ecological Restoration for his work investigating the role plant-soil feedback has on invasion success of *Brachypodium sylvativum*. Andrew travelled to the 2015 Cascadia Prairie-Oak Partnership Conference in Tacoma, WA to present his work.

Kristen Finch (major prof Andy Jones) received the department's Hardman Native Plant Research Grant, sponsoring her travel to Ashland, OR to work with the US Fish and Wildlife Service Forensic Lab. There, she used the Direct Analysis in Real Time Mass Spectrometer for spatial analysis of Douglas-fir wood chemistry across its distribution in Oregon.

Christina Hagerty (major prof Chris Mundt) received an OSU Graduate Student Travel Award which she used to travel to England for the "Resistance 2015" meeting organized by Rothamsted Research. There, she presented a poster titled, "Temporal dynamics of *Z. tritici* fungicide resistance in the Willamette Valley, USA" and enjoyed many fruitful discussions with leaders in the pesticide resistance field.

Ricardo Miranda-Gonzalez (major prof Bruce McCune) attended the 86th annual meeting of the Northwest Scientific Association in Pasco, WA where he presented his poster, "190 years later: the rediscovery of *Polypyrenula albissima*, an enigmatic fungus previously believed to be extinct." Ricardo was also invited to the 12th Meeting of the Latin-American Group of Lichenologists in Ecuador, where he will present a talk entitled "Lichens and invertebrates interactions of tropical dry forests: from taxonomy to ecosystem processes."

Madison Olson (major prof Peter McEvoy) was awarded the NSF Graduate Research Fellowship, Portland Garden Club Katherine R. Pamplin scholarship, and a Native Plant Society of Oregon research grant.

Javier Tabima (major prof Nik Grünwald) was invited to be an instructor at Virginia Tech's

2015 Oomycete Bioinformatics Workshop to teach gene calling, annotation and genomic evolution. He also received an APS Foundation Travel Award, APS Pacific Division Travel Award, and the 1st prize on the Student Oral Presentation Competition for the Pacific Division at the 2015 APS conference in Pasadena, CA with his presentation on Genomic signatures of host jumping onto raspberry and strawberry in two *Phytophthora* sister taxa.

Lindsey Theissen (major prof Walt Mahaffee) received the Pacific Division APS Student Travel Award, the William Moller Student Travel Award from APS Foundation, and the Anita Summers travel award. At the 2015 APS meeting, Lindsey won 2nd place in the Student Oral Presentation Competition for the Pacific Division.

Kevin Weitemier (major prof Aaron Liston) is working toward characterizing the nuclear genome of the common milkweed, *Asclepias syriaca*, with the goal of creating a resource useful for anyone studying this ecologically and evolutionarily important group of plants. He published a paper on ribosomal repeats in *Asclepias* in the online, open-access journal PeerJ (Weitemier *et al.* 2015) and presented that work through an oral presentation at the international Botany conference in Edmonton, Alberta. Also in Edmonton, Kevin co-led a workshop to introduce and train fellow botanists in high-throughput sequencing methods. Kevin received the Anita S. Summers Graduate Student Travel Award to attend the Botany meeting, and received the Portland Garden Club Katherine R. Pamplin Scholarship to pursue work on population genomics in the Oregon native *Asclepias cryptoceras*.

By Zoltan Bair and officers of the GSA

RECENT THESIS TITLES BOTANY AND PLANT PATHOLOGY

Spickerman, Kaleigh	MS	McCune	9/4/2015	Lichen Functional Trait Variation Along an East-West Climatic Gradient in Oregon and Among Habitats in Katmai National Park, Alaska
Mujic, Alija	PhD	Spatafora	6/13/2015	Symbiosis in the Pacific Ring of Fire: Ecology, Evolutionary Biology, and Systematics of *Rhizopogon* Subgenus *Villosuli* as Ectomycorrhizal Mutualists of *Pseudotsuga* Species
Ali, Nijmah	MS	McCune	6/13/2015	When humans fail to tell the story, let the lichens and plants tell it for us: Dating pre-historic cairns in southeast Alaska
Celis, Jessica	MS	Jones	6/13/2015	The role of intraspecific functional trait

				variation in the differential decline of meadow species following conifer encroachment
Theis, Susan	MS	Milligan	3/20/2015	Mitigating harmful Cyanobacterial Blooms: the Role of Plant Humics
Eck, Emily	MS	Gent	3/20/2015	Emergence and Characterization of Virulent Strains of the Hop Powdery Mildew Fungus: Strategies for Short and Long-Term Management
Lawrence, Caitlin	MS	Kaye, Muir	3/20/2015	Responses of Pacific Northwest prairies to soil nutrient manipulations: Implications for restoration of *Castilleja levisecta* and control of invasive species
Colby, Samantha	MS	Moldenke	3/20/2015	Seasonality as a driving factor of decomposition pathways in both meadows and forests: an exploration across a gradient of climate in Oregon

AWARDS, HONORS AND PROMOTIONS

Faculty and Staff

2015 American Phytopathological Society Ruth Allen Award - **Nik Grunwald**

Students

- ***Undergraduates***

Jeannie Klein and **Michelle Reers,** Botany majors**,** were awarded Merrill Family Scholarships for 2015
Katilyn Furnish was awarded the CAS Wayne and Joann Chambers Scholarship for 2015
Cesar Juarez, BioResource Research major, was awarded the 2015 Ernest and Pauline Jaworski Scholarship for Summer Research Experiences for Underserved Undergraduates in Plant Science to work with Dr. John Fowler
Kevin Mason, Botany/Pre-Education major, has received a Jean Siddall Memorial Scholarship for 2015
Luis Martinez-Salinas, Botany major, has received a Jean Siddall Memorial Scholarship for 2015
Jeannie Klein, Botany/Microbiology/Honors major, has received the Bill and LaRea Outstanding Senior Award for 2015,and the Thomas C. Moore Memorial Scholarship for 2015
Tabitha Pearson, Botany/Honors College major, has received the Charles and Helen Fulton Memorial Scholarship for 2015
Megan Seymour, Botany major, has received the Thomas C. Moore Memorial Scholarship for 2015
Carly Allen, Botany/Fisheries & Wildlife major, has received the Thomas C. Moore Memorial Scholarship for 2015
Kaitlyn Furnish, Botany major, has received the Thomas C. Moore Memorial Scholarship for 2015
Shelby Porter, Botany major, has received the Thomas C. Moore Memorial Scholarship for 2015
Lauren Pittis, Botany/Honors College major, has received the Charles and Helen Fulton Memorial Scholarship for 2015
Michelle Reers, Botany/Honors Associate major, has received the Charles and Helen Fulton Memorial Scholarship for 2015

- ***Graduates***

Christina Hagerty in the **Mundt** lab was awarded a Graduate School Travel Award
Matthew Brown in the **Behrenfeld** lab was awarded a NASA Graduate Fellowship
Madison Olson in the **McEvoy** lab was awarded a NSF Graduate Research Fellowship
Jade Florence in the **Pscheidt** lab was awarded an Oregon Lottery Graduate Scholarship

Robert Smith in the **McCune** lab was awarded an Oregon Lottery Graduate Scholarship
Jade Florence in the **Pscheidt** lab received the APS Foundation Individual Plant Pathology Experiential Award
Javier Tabima in the **Grunwald** lab received APS Foundation Elsie J. and Robert Aycock Student Travel Award
Lindsey Thiessen in the **Mahaffee** lab received the APS Foundation William Moller Student Travel Award
Duncan Kroese in the **Zasada** lab received the APS Foundation Janell M. Stevens Johnk Student Travel Award
Lindsey Thiessen in the **Mahaffee** lab was awarded an Anita Summers Graduate Student Travel award for the APS Annual Meeting in August 2015
Kevin Weitemier in the **Liston** lab was awarded an Anita Summers Graduate Student Travel award for the Botany 2015 meeting in July 2015
Kristen Finch in the **Jones lab** was awarded the 2015 Hardman Award for Native Plant Research
Madison Olson in the **McEvoy** lab was awarded the 2015 Katherine Pamplin Scholarship from the Portland Garden Club
Andrew Esterson in the **Kaye** lab was awarded the 2015 Katherine Pamplin Scholarship from the Portland Garden Club
Kevin Weitemier in the **Liston** lab was awarded the 2015 Katherine Pamplin Scholarship from the Portland Garden Club

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IN MEMORIUM

Harold Jensen, 1921-2015

Dr. Harold James Jensen, 93, passed away on May 21, 2015 at his home in Corvallis, Oregon. He joined the faculty of the Department of Botany and Plant Pathology at Oregon State University in 1950, where he spent 33 active and productive years advancing the science of nematology until his retirement in December 1983.

Harold pioneered the development of nematology in the Pacific Northwest. He was involved in all facets of nematology from classroom instruction and directing the research of some 21 graduate students to conducting applied and basic research himself. He was co-founder of the nematode testing service in the Oregon State University Plant Clinic. His applied research was directed toward nematode diseases and their control on alfalfa, cane and strawberries, cereals, potato, mint, onion, other vegetables, and grass seed crops. He brought soil fumigation in Oregon from its infancy to a recognized requirement which resulted in its becoming a standard practice for several crops. He developed a nematode control program for Oregon's major bulb industry which involved crop rotation, heat treatment, soil fumigation, and chemical dips. The cereal cyst nematode was first discovered in the U.S. in Oregon, and Harold initiated and directed studies on this pest. Other investigations included nematode interactions with other plant-parasitic nematodes and plant pathogens, including viruses. He was also involved in basic research and published a range of taxonomic papers that included descriptions of new species of plant-parasitic nematodes affecting Oregon crops and systematic investigations into the Mononchidae (a group of nematodes that are predators of other nematodes), including a definitive monograph of the Mononchidae of Oregon with the Canadian nematologist Roland H. Mulvey.

Harold was one of the first graduate students of Professor Merlin Allen, whose taxonomic interests whetted those same interests in Harold. He had a basic premise that all nematologists should be thoroughly familiar with the systematics of nematodes and have an appreciation for the controversies of the subject. He emphasized also the importance of being able to identify the large groups of free-living nematodes. Harold was of the opinion, following the philosophy of Gerald Thorne, that any scientist who was to work as a nematologist

had to be able to identify the animals correctly before they could do any other research on them. His emphasis on collecting is reflected in the vast collection he developed of Oregon fauna and marine nematodes from the coastal waters of the Pacific Northwest, Hawaii, and Alaska. Specimens from these collections are permanently mounted and are on deposit in the Nematode Collection at the University of California, Davis.

A major interest that Harold pursued in the years immediately preceding retirement was the potential relationship of “saprozoic nematodes" to animal and plant diseases. After observing algae, bacteria, bacterial and fungal spores, and protozoa in the alimentary tracts of these nematodes, he and his students conducted numerous experiments on survival of ingested organisms.

He was an excellent teacher, utilizing many techniques to motivate and stimulate the individuals working with him. He set aside a specific time each day in the laboratory, the "show and tell session”, with unknowns available for identification. It was a contest among the students, and the loser bought the refreshments in the Student Commons. Many graduate students paid and profited by this teaching method, and now they are leading nematologists throughout the United States. Harold was a central participant in the Western Regional Project in Nematology, and participated in many statewide grower activities. He was never too busy to talk or to consult on agricultural interests. He truly deserved the title "Mr. Nema”, in Oregon. However, his interests took him further afield through invitations to serve as consultant to the Hawaiian Sugar Planters Association, and as a reviewer of nematology programs at the International Potato Center (GIP) in Lima, Peru.

He was one of the few scientists of his day that saw the need for a society to represent nematologists throughout the world. As one of the founding .members of the Society of Nematologists, he organized the first meeting. This was held at Corvallis in 1962. He later served the Society as Vice-President and President (1971-72). His professional wisdom benefitted many committees of the Society of Nematologists and the American Phytopathological Society. Indeed, he not only gave sound advice to the committees, but took great pleasure in the achievements of its members. His selfless attitude contributed greatly to the success of others.

In recognition of his scientific achievements, Harold was elected a Fellow of the Society of Nematologists at the first awards ceremony for this honor, in 1981. He also received the title of Honorary Member in 1991 for his many outstanding contributions. This is the highest honor the Society of Nematologists can bestow. No more than one person can be awarded with this title in any year and the number of living honorary members cannot exceed 2% of the total membership.

In his leisure time, Harold enjoyed wood carving and wood working, oil painting, competitive horseshoeing, fishing, crabbing, gardening, golf, and bowling.

By Russ Ingham

Robert Powelson, 1929-2015

Bob Powelson, fly fisherman extraordinaire, plant pathologist, passionate gardener, boatman, loving husband, and caring father died at his home in Corvallis, Oregon, on March 9, 2015. He lived a full and rich life of more than 84 years.

Robert Loran Powelson was born in Salt Lake City, Utah, to Loran George and Mabel Eliza Powelson on September 23, 1929. Bob graduated from Utah State University in 1951 with a B.S. in Botany and Plant Pathology. He was in the ROTC program and was commissioned as a 2nd Lieutenant upon graduation. From 1951 to 1955, he served in the U.S. Air Force, both at Frances E. Warren Air Force Base in Cheyenne, Wyoming, and in Germany at the Bitburg and Fürstenfeldbruck Air Force Bases, where he was the chief supply officer. Following his honorable discharge from the Air Force, he returned to Utah State University, where he earned a M. S. in plant pathology in 1956. He then moved to Corvallis

to attend Oregon State University (OSU), where he completed his Ph.D. in plant pathology in 1959.

Bob joined the faculty of the Department of Botany and Plant Pathology at OSU in 1959, where he led a research team focused on the epidemiology and management of wheat diseases. In the early years of his faculty position, he taught an undergraduate plant pathology course. Later, he taught a graduate-level course in epidemiology and disease control. Bob specialized in cereal diseases, doing his research primarily in the semi-arid wheat lands of eastern Oregon. His research centered on survival and dispersal of wheat pathogens, particularly stripe rust, and several soilborne diseases. Bob was an excellent advisor and mentor for his graduate students, taking a close interest in their work and their personal lives as well. He taught them the importance of maintaining an appropriate balance between career responsibilities and other life activities. Many of Bob's PhD students went on to have successful careers of their own in plant pathology, including Ralph Byther, Greg Shaner, Randy Rowe, Gary Beaver, Mark Halsey, and Mary McCoy, who later became his wife.

In December 1984, Bob retired from OSU and spent the next 30 years pursuing his many interests, including fly-fishing, camping with friends, clamming on the Oregon Coast, and creating a world-class vegetable, fruit, and flower garden. He and his wife Mary fostered life-long friendships with Plant Pathology colleagues near and far, sharing dinners with their colleagues at OSU each month for more than 40 years, and hosting many memorable outings and gatherings with colleagues from around the globe.

Bob is survived by his wife, Mary Powelson; his sister, Judy Folsom of Salt Lake City; his daughters, Jan Day (Michael Day) of Salem and Jo Lynn Moniz (Lawrence Moniz) of Seattle; stepson Mark McCoy of Kenai, Alaska; four grandchildren, Stephanie Colletta (nee Moniz), Brandon Day, Catherine Moniz and Jennifer Day; and a step-grandson, Hunter McCoy.

By Joyce Loper and Randy Rowe

C.E."Jack" Horner, 1925-2015

Chester Ellsworth "Jack" Horner, 90, passed Saturday, June 27, 2015, at the Ami Care Foster Home.

Born March 2, 1925, and raised in East Salem, Marion County, he enlisted at the young age of 18 and served in the U.S. Navy during World War II in the South Pacific. After returning home, he graduated from Walla Walla University in Washington with a Bachelors of Science in Biological Sciences. In 1954 he received his PhD in Plant Pathology from Oregon State University, joining the faculty as assistant professor in botany and plant pathology with responsibilities for both extension and research. From 1959 to 1968 he had a divided position between OSU and the USDA Agricultural Research Service. He then assumed a full-time position as leader for hops and mint, becoming research leader for the Field Crops Breeding and Production program and leader for Corvallis ARS laboratory, until his retirement in 1980.

Dr. Horner is credited with development of the Cascade Hop, widely used both domestically and internationally for beer production. He was honored as an OSU Diamond Pioneer for Agricultural Career Achievement in 2000.

After retirement from OSU and the USDA, Dr. Horner worked as a consultant for the hops industry and a United Kingdom-based candy company overseeing mint quality.

An avid hunter and fly fisherman, Dr. Horner was a longtime member of the Izaak Walton League. He also enjoyed camping, hiking, snow and water skiing; along with playing bridge and pinochle with his colleagues from OSU.

Extracted from the Corvallis Gazette Times

Duane Coyier, 1926-2015

Corvallis resident Duane Coyier passed away on Tuesday, Feb. 10, at the age of 88.

He was born in Aurora, Illinois, to Lee Orin and Edna Elizabeth Coyier.

His alma mater was Rewey High School, Rewey, Wisconsin. Upon graduation, he joined

the U.S. Navy and became a radio technician. He served aboard the USS LCS 117 during World War II and returned home to Madison, Wisconsin, where he began studies at the university. Duane met Shirley Mae Peterson and the couple married on June 28, 1947, at which time Duane had completed one year of studies at the University of Wisconsin.

He received a Bachelor of Science degree in horticulture in 1951, and after a brief experience with the nursery business in Santa Maria, California, returned to Madison to finish his doctorate in plant pathology in 1961. Their first daughter was born in 1949, followed by a son and another daughter. The family moved to Hood River, where Duane did research for the U.S. Department of Agriculture in the tree fruit industry at the Experiment Station there.

In the mid-1970s he was transferred to Oregon State University, where he worked on ornamental crop diseases and taught graduate student classes until his retirement in 1986. Duane and Shirley then started Coyier's Roses, specializing in miniature roses. He was active in the Corvallis and Albany rose societies, serving as a consulting rosarian. He also volunteered many hours at the Avery Park Rose Garden. His devotion to volunteering was continued with service to the Masonic Lodge and the Demolay youth program, as well as with animal and gardening projects with 4-H.

Duane was an avid sailor and Commodore of the NW Catalina 22 fleet, winning many racing trophies and awards throughout the years. He also had a passion for backpacking, fishing and skiing, and taught ski school. He was one of the visionaries who scouted site locations for Mt. Hood Meadows.

Extracted from the Albany Democratic Herald

THANK YOU DONORS

The following individuals and organizations generously supported the Department (not including those who donate solely to the Oregon Flora Project) with donations received between December 2014 and November 2015. Those who wish to remain confidential are not listed.

John and Cathleen Alden
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Tara Sechler	Luise Walker
Denise Seliskar	Donald and Priscilla Zobel

ALUMNI NEWS

Cathy Macdonald (MS McEvoy)

A recent OPB radio talk show episode highlighted the debate about the intrinsic value of nature versus the value of nature for humans. The segment features Dr. Michael Nelson, an OSU professor of philosophy and environmental ethics and Cathy Macdonald, the Oregon Director of Conservation Programs for the Nature Conservancy. For more information about Cathy's work see http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/oregon/catherine-macdonald-bio.xml

Hiram Larew (MS Rickson, PhD McEvoy)

After 31 years of federal service, Dr. Hiram Larew, who holds a courtesy position in BPP, has retired from his position as Director of NIFA's Center for International Programs. Dr. Larew was recognized in 2010 with the College of Agricultural Sciences Legacy Award.

In lieu of a retirement gift, if anyone would like to make a donation, please support the Oregon State University College of Agricultural Science's Global Experience Fund that Hiram helped to establish and is committed to support during its first five years. Info on the Fund is at http://agsci.oregonstate.edu/international/global-agriculture/about.

Paul Hessburg (PhD Hansen)

Paul Hessburg is now a research ecologist with the Pacific Northwest Research Station, Wenatchee, WA. His research focuses on the landscape and disturbance ecology of historical , current and future western forests; resilience mechanisms of large landscapes; decision support for environmental analysis and planning; and research and development to support landscape restoration.

Keith Reynolds (MS Hansen)

Keith Reynolds is a research forester with Pacific Northwest Research Station, Corvallis, OR. His research focuses on providing decision support for environmental analysis and planning. He is currently developing applications using the Ecosystem Management Decision Support System for a wide array of problem areas.

Tom Kaye (MS Chambers, PhD Pyke/Muir)

Tom Kaye, Director of the Institute for Applied Ecology in Corvallis, OR and courtesy faculty member with BPP, was recently featured on Oregon Public Broadcasting radio news promoting the Institute's fun take on the invasive species problem by featuring them in delicious dishes annual feast and cooking competition called "Eradication by Mastication." They even put out a cookbook of invasive species recipes called "They're Cooked." See more at http://www.opb.org/news/article/invasive-species-menu/

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, William C. Denison Memorail 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, James Sandeno Memorial Fund,** and the **Roy A. Young 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.

Department of Botany and Plant Pathology
2082 Cordley Hall
Corvallis, OR 97331-2902

ADDRESS SERVICE REQUESTED

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
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