Professional Development—Anywhere, Anytime!

Doug Jardine, APS Webinar Acquisitions Editor-in-Chief, jardine@ksu.edu

In the March edition of Phytopathology News, you may have seen a short article encouraging APS members, especially student and early career members, to visit the Professional Development Center (PDC) (formerly CADRE). As stated in the article, the center has excellent resources on building a career with materials prepared for and by successful plant pathologists.

In an effort to provide additional resources to the site, the APS Office of Education has created a new position, the webinar acquisitions editor-in-chief, which I have agreed to fill. The charge to me is to develop a series of webinars that will assist the career development of APS members in areas outside of subject matter expertise. As an example, our first webinar is scheduled for May 24 with the title, "Project Reporting and Writing Impacts: Who Cares? You Should!" It will be presented by Marty Draper, former national program leader with the National Institute of Food and Agriculture (NIFA) and current head of the Department of Plant Pathology at Kansas State University. Impact statements are often required for project reports, annual performance evaluations, and tenure and promotion packets. From personal experience, many of us struggle on how to write a good one. If you have similar experiences, this webinar is for you. Watch for more details on the webinar as they are developed.

While the PDC has some excellent written materials, the webinar format will allow real-time interaction between the audience and the presenter without the expense of traveling to a meeting site. For those unable to participate in the live event, they will be recorded and posted to the APS website for viewing anywhere, anytime!

Some of the webinars will be developed from sessions at the annual meeting. For instance, a session in Tampa, entitled "Fieldside Manner: Serving Plant Pathology’s Stakeholders," had an overflow crowd of 160 people in the room. With that much interest from annual meeting attendees, how much more might there be from those who were unable to attend the meeting or were unable to attend the session due to conflicted schedules or because there was no space for them in the room? I am currently working with the organizers and presenters of that session to develop a two- or three-part webinar series that we hope to air later this year.

Lastly, I want to make a plea for content. The success of this project will depend on creating subject matter content of interest to the membership and finding the people capable of developing the idea into the webinar format. If you have an idea for a professional development webinar topic, please send it to me at jardine@ksu.edu. If you know of someone from either inside or outside of APS that would make a good presenter or organizer for the topic, maybe even yourself, please send me your suggestions. It is our intent that the content will be peer reviewed prior to airing so that it can be included as scholarly material for a curriculum vitae. Working together on this project, we can make ourselves better professionals, whether we work in academia, government, or the private sector.

SAVE THE DATE!
Join APS for the webinar “Project Reporting and Writing Impacts: Who Cares? You Should!” on May 24. Marty Draper, head of the Kansas State University Department of Plant Pathology, will serve as the presenter. Read more about this presentation and register online at www.apsnet.org/publications/webinars.

VOTE!
APS Election Opens Next Month

Voting for the 2017 election opens May 2, 2017. Profiles of the top two candidates for president-elect and councilor-at-large will be published in the May issue of Phytopathology News. You will receive an e-mail on May 2 with a link to the online APS Officer Election. Instructions for voting will be provided within the online ballot. Voting closes on May 31, 2017. (Members without an e-mail address on file will be mailed materials.)
The first new fungicides were developed after serendipitous but prudent observations. For example, brining of grains with salt water was first tried in the mid-1600s after noticing wheat seed retrieved from a sunken ship off the coast of England was free of the smut fungus. Other chemicals eventually as potential seed treatments included hot water, formaldehyde, and organic mercury products.

The elements arsenic, mercury, sulfur, and copper are toxic to all living organisms and have thus played pivotal roles as components of the early fungicides developed and tested for protecting crop plants. Two of the most commonly used elements for plant disease control have been sulfur and copper.

**Bordeaux Mixture**

The Bordeaux (refers to a wine-producing region in France) mixture is a copper-based concoction composed of three inexpensive, easily obtainable ingredients, including copper sulfate, slaked lime, and water, and its use was largely driven by severe epidemics of downy mildew in the European grape industry. Pierre Millardet is generally credited with the discovery of Bordeaux mixture in the early 1880s, despite the fact that numerous individuals had previously identified the role of copper sulfate as an effective fungicide and it had been in widespread use for more than a century. This fallacy of the fungicide’s origin is the rest of the story.

**Copper Sulfate**

The earliest record demonstrating the fungicidal properties of copper was reported as early as 1761 by H. Schultes with the application of bluestone (copper sulfate) as a seed treatment for smut control on cereals. In the early 1800s, Isaac-Benedict Prevost observed copper solutions killing or suppressing spore germination of the bunt fungus in the lab.

The Belgian Charles Morren promoted copper sulfate (as a soil drench) for use in controlling potato late blight during the height of the epidemic in Europe in the mid-1840s. American contemporaries Judge Cheever and James Teschemacher both advocated the use of copper sulfate as a late blight protectant. Cheever was aware of its use in France after reading a translation of Prevost’s work for cereal smuts and postulated that late blight had a similar fungal cause.

Teschemacher was a horticulturalist and chemist who reputedly learned of the benefits of copper sulfate from a translation of Morren’s work and promptly its use combined with lime as both a seed and soil treatment for potatoes. However, he and Morren missed their opportunity for achieving notoriety due to their emphasis on using the product as a seed and soil treatment, delaying the discovery and use of copper-based fungicides on foliage for another 40 years.

**The French Wine Industry and Copper**

Viniculture in France in the mid-1800s produced a common and inexpensive chemical that was familiar to grape growers throughout southern France. Verdigris, or basic copper acetate, was formed as a byproduct after layering sheets of copper with the pressed, fermenting skins of grapes after juice extraction. One of its unique uses was combining with lime water and splattering the sickly blueish-green substance on vines late in the season near roads with the purpose of suppressing the sampling of grapes by passing pedestrians.

Copper sulfate had also routinely been used for decades as a wood preservative for the poles upon which grape vines were trained to protect them from weathering and rotting. As a result of this practice, it was directly observed that mildew was reduced in the vicinity of the treated poles compared to those plants distant from the stakes.
The widespread general usage of copper sulfate with lime made the discernment of its fungicidal characteristics inevitable. Millardet noted these relationships and theorized that the fungus could be managed with the proper chemicals. He then experimented with combinations of elemental salts, table salt, and lime and found that the original mixture of copper sulfate and lime, currently being commonly used in the vineyards throughout France, worked best. He was aware that copper sulfate had been used for more than 100 years for treating wheat seeds, but it had not been tested on foliage. The results from 1883 were promising enough to repeat the next year, but the disease incidence was low and results were inconclusive for 1884.

**Millardet’s Dilemma**

At this time, a number of other viticulture workers utilizing copper sulfate began claiming proprietary ownership for discovering the cure for downy mildew in France’s vineyards. Millardet now was faced with the predicament of either keeping the results secret for another year of testing or report on incomplete data. In order to optimize his opportunity for fame he decided to report his results. After publication, many growers in the region tried the remedy on hundreds of thousands of vines the next season with spectacular results, thereby cementing Millardet’s legacy.

Both E. C. Large and James Horsfall have painted a somewhat unflattering picture of Millardet and his role in the discovery of Bordeaux mixture in their historical accounts. Horsfall thought that Millardet received more accolades for this honor than was warranted, claiming that he was simply a superior and opportunistic salesman. Large was somewhat kinder by stressing that Millardet’s primary contribution was recommending the usage of the fungicide with the novel purpose of applying on green foliage. Now you know the rest of the story.

**REFERENCES**

Horsfall, J. G. 1956. The fight with the fungi or the rusts and rots that rob us, the blasts and the blights that beset us. Am. J. Bot. 43:532-536.


New Paper Published in *Phytobiomes* May Lead to Novel Methods of *Rhizoctonia solani* Control

*Rhizoctonia* species—and *R. solani* specifically—are a complex group of soil fungi with broad host range and worldwide distribution.

In a research paper just published in *Phytobiomes*, APS's new and fully open-access and transdisciplinary journal, University of Florida researcher Ken Obasa and colleagues identified a novel and important biological aspect of *R. solani* while investigating brown patch-infected cool-season turfgrasses. The intriguing observation was that *R. solani* isolated from diseased tissue was persistently associated with bacteria during growth on solid media. This led them to uncover the impact of a bacterium on brown patch disease.

The findings of this study suggest that at least some *Rhizoctonia* species in the anastomosis group 2-2IIIB can harbor intracellular bacteria that affect the biology of their fungal host and, in turn, the way the fungus interacts with plants. Ultimately, this research helps raise the prospects for developing alternative *Rhizoctonia* disease management strategies in plants.

The article, entitled “A Dimorphic and Virulence-Enhancing Endosymbiont Bacterium Discovered in *Rhizoctonia solani,*” offered several interesting findings:

- An endosymbiotic bacterium can influence the disease phenotype of the turfgrass brown patch pathogen, as the disease was greater when the bacterium was present.
- The elimination of the bacterium from its fungal host by antibiotic treatment resulted in a significant decrease in the production of the virulence factor phenylacetic acid (PAA).
- Wild-type *R. solani* and *R. solani* cured of the endosymbiotic bacterium appear genetically identical, with no variation seen in cultural characteristics and DNA profile, which suggests that the changes in PAA production and virulence could be attributed to the loss of the bacterium.

This and similar recent discoveries raise important questions about the distribution and significance of fungal microbiomes to our understanding and management of phytopathogenic fungi.

“This research provides novel insights into fungal-bacterial symbioses and sheds light on the complexity of within-microbiome interactions to enhance fungal virulence and plant disease,” said Carolyn Young, editor-in-chief of *Phytobiomes*. “This research represents phytobiomes in action, fungal-bacterial interactions that enhance the virulence of a plant pathogen. We can now utilize this knowledge to identify better management strategies for the disease.”

View this article at [http://apsjournals.apsnet.org/doi/full/10.1094/PBIOMES-08-16-0005-R](http://apsjournals.apsnet.org/doi/full/10.1094/PBIOMES-08-16-0005-R), which has so far been featured in four science news outlets, 29 tweets, and three Facebook pages. Then visit [www.phytobiomesjournal.org](http://www.phytobiomesjournal.org) to learn more about the scope, intended readership, and other aspects of publishing in this important new journal of our society.

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ICERR Intern Receives Training in Systematics and Diagnostics in One-of-a-Kind Opportunity

Emma Wallace, ICERR Fellow, Emma.Wallace@ars.usda.gov

Who knew systematics influenced so many aspects of plant pathology? From my coursework, I understood it was important, but didn't realize the scope of this discipline and how it seems to be interwoven with many of our scientific community's efforts. This is what I am learning every day as a participant in the Integrated Clinical, Extension, Research, and Regulatory (ICERR) Internship in Systematics and Diagnostics. While earning my master's degree at North Carolina State University, my interest in developing and utilizing tools to evaluate intra-species diversity grew. Through my thesis research and contribution to other projects, I learned how the analysis of pathogen's population genetics can help shape our understanding of how the genetic composition of a population of causal agents behaves and changes over time and space. This information allows us to identify trends that can help us in tailoring management strategies for a specific region or affected commodity. However, I also learned that an accurate diagnosis is the first step in synthesizing the most effective management strategy. Learning and utilizing the theory and elements contributing to an accurate diagnosis is the overarching goal of the ICERR Internship, which I began in October of 2016.

This Farm-Bill-funded program, now in its second cycle, aims to train young scientists in classical morphological identification and molecular approaches to diagnosing fungal and oomycete plant pathogens. Training in concepts, such as taxonomy, nomenclature, and systematics, is accomplished through an ongoing research project through the Systematic Mycology and Microbiology Lab (SMML) at USDA ARS and through in-lab rotations with the U.S. National Fungus Collection, Rutgers University Cooperative Extension, the University of Maryland Plant Diagnostic Clinic, and USDA APHIS. I really enjoy that the research component of the internship and the rotations are interconnected and build upon each other.

ICERR, continued on page 45
As I work on the research component of the internship, which involves revising taxonomy within downy mildew organisms that infect Asteraceae, the lessons and resources from the rotation labs become crucial. I plan to obtain contemporary samples from diverse hosts and locations as I learn about diagnosing diseases and synthesizing disease management strategies in greenhouse and nursery production with Rutgers Cooperative Extension. I will learn about the use of cutting-edge sequencing technologies in the development of molecular markers with USDA APHIS, and see how principles of taxonomy and systematics contribute to an appropriate diagnosis. Working in the University of Maryland Plant Diagnostic Clinic and with USDA APHIS will give me hands-on experience using traditional morphological approaches as well as molecular identification tools.

Finally, the use of herbaria samples through the U.S. National Fungus Collection will allow us to compare a wide range of historic samples that can provide insight on genetic changes over time that will better shape our understanding of a given organism’s evolutionary history and, in turn, its taxonomy. This collection and associated databases are also vital resources to the scientific community, and ongoing curation and continued submission of voucher specimen are essential for capturing genetic diversity, ensuring future scientists have this same resource.

It is exciting to be learning about systematics and diagnostics in this setting. The ICERR internship is a one-of-a-kind opportunity to gain a holistic understanding of these disciplines and how they connect to various career paths within plant pathology. The resources and mentors of each component provide their own objectives and perspectives, and yet they complement each other to provide a broader understanding of the subject. Having that awareness will lead to the most appropriate and effective solutions when providing a taxonomic or diagnostic resource.

I would like to thank my mentors of the ICERR Internship: Jo Anne Crouch (USDA ARS SMML), Ann Gould (Rutgers University), Karen Rane (University of Maryland), Yazmín Rivera (USDA APHIS Molecular Diagnostics), Megan Romberg (USDA APHIS Intercepted Port Materials), and Lisa Castlebury (USDA ARS SMML and the U.S. National Fungus Collection and Databases). ■

Summary of NAS Forum on Genetically Engineered Crops

The purpose of this article is to assure widespread awareness among APS members of an important report on genetically engineered (GE) crops.

Paul Vinicelli, APS Councilor-at-Large, pvinicelli@uky.edu

Last May, the National Academies Press published a report entitled, “Genetically Engineered Crops: Experiences and Prospects” (available at www.nap.edu/download/23395). In December, the National Academy of Sciences (NAS) Board of Agriculture and Natural Resources convened a Forum of Scientific Society Leaders on Genetically Engineered Crops: Experiences and Prospects (http://dels.nas.edu/Upcoming-Event/Forum-Scientific-Society-Leaders/AUTO-5-80-52-G?bname=banr#agenda) to consider future directions suggested by the findings of the report. Invited participants represented a highly diverse body of scientific societies and other organizations with an interest in the science behind the agronomic, health, environmental, and socioeconomic dimensions of GE crops. I was invited to represent our society by APS President Tim Murray.

Participants in the forum generally agreed that the NAS report represents an authoritative, comprehensive, thoughtful review of peer-reviewed literature on highly diverse aspects of the subject of GE crops. Notable quotes from the report include:

- “…no differences have been found that implicate a higher risk to human health safety from these GE foods than from their non-GE counterparts”
- “…no evidence [has been reported] of cause-and-effect relationships between GE crops and environmental problems”
- GE crops have “generally had favorable economic outcomes for producers who have adopted these crops, but there is high heterogeneity in outcomes”
- Whether GE crops “benefit intended stakeholders will depend on the social and economic contexts in which the technology is developed and diffused”
- “…it is the product, not the process, that should be regulated.”

In my prepared comments (https://vimeo.com/album/4310385/video/195866079), I emphasized two aspects of GE in relation to crop diseases:

1. Greater deployment of genetic traits for disease resistance (both GE and conventional) is essential if we are to reduce the use of pesticides for disease control;
2. A wide array of genetic traits for disease resistance is needed in order to sustainably deploy resistance traits (both GE and conventional). This is because having an assortment of diverse genetic traits for disease resistance permits breeders to avoid overreliance on a limited pool of resistance genes. More on this can be found in my review paper in Sustainability (2016) 8(5), 495; doi:10.3390/su8050495.

I also spoke (during the closing discussion) about the importance of interfacing with science teachers. There is no question that we professional scientists must engage the public on important topics, including GE crops, as our schedules, skills, and interests permit. However, ultimately, classroom teachers must be aware of the findings of the NAS report—and they must have appropriate curricular materials on GE crops that help them fulfill important learning objectives—if we hope for the public to be able to consider fundamental scientific findings as part of the broader societal dialogue on GE crops.

The NAS forum provided an excellent opportunity for APS to build professional networks with impressive colleagues representing highly diverse sciences and who possess advanced knowledge relevant to GE crops. As an example, I served on a writing team that drafted a commentary for the journal Nature Biotechnology, which we 14 authors hope to see published soon. Indeed, I anticipate ongoing benefits from APS’s participation in the forum.

The issue of GE crops remains a fundamentally important one for all agricultural scientists, especially with the emergence of CRISPR-based genome editing technologies. I encourage APS members to be generally aware of key findings and recommendations of the NAS report. The full report (nearly 600 pages) is available at the link provide above. An abbreviated file, containing only findings and recommendations, is available at http://nas-sites.org/ge-crops/files/2016/05/All-Findings-and-Recommendations.pdf.

APS members are invited to contact me with questions or concerns about any aspect of the topic of GE crops.
Sometimes around 1970, I acquired my first 35-mm single lens reflex camera, and I was on my way to a lifetime indulgence in photography. I was a yearbook photographer at my high school. I have since traveled around the world on assignments and vacations and eventually amassed a collection of slide and print images that numbered in the thousands; and that was after ruthless editing and discarding all but the very best of the images. Rule number one: never let anyone see the bad ones. It makes everyone think you’re a better photographer than you really are.

The downside is that these superb images are ephemeral. Emulsions fade and images degrade over time even under the best archival conditions. The most practical way to conserve film images is to convert them to digital form. That represents an unthinkable and herculean task for most owners of film-based image collections. The original images will generally require correction and repair: a task best left to highly skilled and trained technicians, with access to some very sophisticated and expensive equipment. Don’t try this at home.

For APS, there is a societal need to manage this task. We maintain one of the largest image databases on plant pathogens and diseases. The APS members with perhaps the greatest trove of images are people like me. They are sitting on a goldmine, but the need to convert those images to digital format is all too easily pushed aside by other seemingly more time-critical tasks. We might not like to think of all those images ending up in a dumpster, but it is an absolute certainty that their time will eventually run out. Grim thoughts, eh? OK, let’s fix this problem.

APS has contracted with Scan Café (www.scancafe.com) to provide image conversion services to all APS members at a substantial discount. Scan Café is a well-established company that provides exceptionally high-quality services. I have personally used them to convert over 5,000 35-mm color slides to high-resolution (10 megapixel) digital format. Their standard services include color correction, as well as dust and scratch removal. I have been completely impressed by the quality, especially considering that some of my original images were captured about 35 years ago when I was a newly admitted graduate student in the diagnostic lab at the University of New Hampshire.

What does it cost? For 35-mm color slides or negatives, the lowest cost option is to submit at least 500 slides in what Scan Café calls a Value Kit (www.scancafe.com/pricing). The nominal price is $0.21 per image. For smaller quantities, APS members will receive a 30% discount off the regular price: about 24 cents per image. Base prices are slightly higher for other services for other media (prints, film, or videotape) or for fewer than 500 slides, but fees for these media are also discounted 30% for all APS members. Members in a common location can always pool their images and submit them under one member’s name to meet the 500-image threshold to obtain the best price. Scan Café offers similarly low-priced options for any number of images, including more intensive image repair for higher-value and unique images. Details on the various services are described very well on their website.

This requires a leap of faith for most people. Those images are irreplaceable if they are lost, and there is a natural reluctance to entrust them to complete strangers in the hope that they will someday return. Think of it this way: Scan Café has converted over 134 million images. The percentage lost in the process is a decimal point followed by many zeros. Now, contrast that infinitesimally small risk of loss to the almost certain annihilation of the images at some future date if they are not converted.

Now, stop worrying and send them off. If you are like me, and are a bit risk averse, you can hedge your bets and send them in multiple shipments.

Once you’ve shipped your materials to Scan Café, you will be notified at each step in the process (arrival at Scan Café, conversion to digital format, and availability for online viewing). You will have the option to review your scanned images online to ensure they are acceptable. You can then complete the transaction online and pay for the service. You can immediately download your images, and your originals will be returned to you, along with a DVD containing the high-resolution scans.

I know what you’re thinking. What if I want to toss in a few images that are not necessarily related to work? That image from your undergrad days perhaps? No problem. The discounted service is offered to APS members, period. Scan Café will apply the 30% member discount equally to any film-based image they receive from you.

Once you get your images back, you’ll want to select the best of the best to submit to the APS Image Database (https://my.apsnet.org/custom/imageDatabase/Search.aspx). This process is easy, and we are in the process of streamlining it to make submission even easier. APS will provide a form needed to record necessary information for each image, such as host, disease, causal agent, and a brief caption. You can submit images to APS, or bring your best images on a USB drive to the annual meeting in San Antonio, where we can help you submit them to the APS Image Database. Stick with us. We’ll make you famous!
Southern African Society of Plant Pathology Celebrates Fiftieth Anniversary

Teresa Coutinho, Past President of SASPP, teresa.coutinho@up.ac.za

The celebratory Southern African Society of Plant Pathology (SASPP) Congress was held at Champagne Sports Resort in the Drakensberg Mountains of South Africa January 15–18, 2017. The occasion was commemorated by a presentation on the history of the society by Frits Rijkenberg and John Mildenhall. There were a number of notable events and the one remembered with much fondness was the congress held in a tent in the Eastern Cape in the early 1990s.

Roland Schulze (professor emeritus, University of KwaZulu/Natal [UKZN]) opened the congress with a discussion of the impact of climate change on the agricultural sector in South Africa. Two past UKZN graduates and eminent members of APS, Lindsey du Toit and Alison Robertson, were invited to present the J. E. Vanderplank Memorial Address and a keynote address, respectively. du Toit discussed spinach seed crop pathology research and extension, while Robertson's address focused on the disease triangle. Another APS member, Carolee Bull, presented the Ethel M. Doidge Memorial address on bacterial taxonomy. Robert Jackson (University of Reading) and Dawn Arnold (University of the West of England) presented keynotes on biological control of aphids using bacteria and the genomic island in Pseudomonas syringae pv. phaseolicola, respectively. In total there were 64 oral and 81 poster presentations.

As at every SASPP Congress, members of the society and guests were encouraged to participate in what is now famously known as the Mildenhall Stakes. The objective of this task is to balance a beer on your forehead and then maneuver your body in such a way that you can then drink the beer without touching it with your hands/arms. No easy task for the not so young!

Members of The American Phytopathological Society congratulate SASPP members on this very successful conference and on reaching the milestone of the Fiftieth Congress of the SASPP.

Delegates at SASPP’s Fiftieth Anniversary Congress in January 2017.
Books for the World Program Awarded Announced

Books for the World is an APS Foundation fund, managed jointly by the foundation and the APS Office of International Programs (OIP). The Books for the World award program was established to provide resources from the APS online bookstore to scientists, extension educators, diagnosticians, instructors, and others in developing countries, with a focus on materials to enhance plant disease diagnostics and integrated pest management.

Sylvester Aigbe at the Ambrose Alli University in Nigeria requested resources for the Phytopathological Society of Nigeria (PSN) library. The resources are meant for the use of Nigerian plant scientists for consultation purposes and to gather information on the most recent plant pathology science.

Learn more about the award at www.apsnet.org/members/foundation/apply/Pages/BooksfortheWorldAward.aspx. The APS Foundation and OIP would like to continue to provide resources through the Books for the World award program with your support. If you are interested in donating to this fund to support future awards, please visit www.apsnet.org/members/foundation/giving/funds.
On February 28, 2017, the College of Agricultural, Human, and Natural Resource Sciences (CAHNRS) at Washington State University (WSU) hosted a Three-Minute Thesis Competition. Joey Deshields, an M.S. student with Kiwamu Tanaka, won second place (runner up) for the master's level. Olga Kohzar, a Ph.D. student with Tobin Peever, was awarded the People's Choice Award. Each of them won prize money and deep admiration.

### Award

The Washington Winegrowers Association organized a poster session at its annual convention held February 7–9, 2017, at Kennewick, WA. Among the several research posters judged by grape and wine industry stakeholders at the annual convention, Naidu Rayapati’s grape virology team received two prizes under the professional category for the following posters. They took home Second Prize for the research poster entitled “The complete genome sequence analysis of Grapevine leafroll-associated virus 1 for practical applications in vineyards” presented by Sridhar Jarugula (post-doctoral associate with co-authors Bhanu Priya Donda and Rayapati) and Third Prize for the research poster entitled “Double whammy: Impacts of grapevine leafroll and red blotch diseases in commercial vineyards” presented by Prashant Swamy (post-doctoral associate) with co-authors Jarugula and Rayapati.

### Student Awards

There is no one in the history of the Department of Plant Pathology at University of California (UC)-Berkeley, founded in 1903, like Arthur Hamilton McCain. He passed away at age 91 on January 17, 2017. Art was a man of many faces and extraordinary abilities. Some of the words trying to describe him are fun loving, objective, provocative, outrageous at times, and highly intelligent. He could be a comedian, party animal, or serious scientist. Former students and staff often comment about the family and fun atmosphere of the department and its high esprit de corps. Art had much to do with this. He organized fishing and abalone trips, family camping outings, departmental parties, poker parties, and often on Fridays after work he presided over a happy hour. He also could be counted on to promote lively conversations at the two coffee breaks attended by staff, students, and faculty, day and night. These were part business as well as social. This was an important highlight for many visitors and afforded the opportunity for students to interact with well-known pathologists from throughout the world. Art had little interest in administration, disliked pretentious pontification, but nevertheless played an important role at faculty meetings. With a sharp wit, he had the knack to bring subjects to fruition. He was not impressed with hierarchy and made everybody feel they had a place in the department’s success. He thought it important that members of the department have a good understanding of the breadth and depth of the field of plant pathology and often took students and staff, including secretaries, on field trips. Frequently after fieldwork on ornamentals, he would bring flowers to employees. Art’s early years and dates are sketchy because he did not have the usual family experience, making his life even more remarkable. His father died when he was age two, leaving his mother to raise three young children ages one to three. He also had an unusual schooling, attending a number of schools: a private school in Los Gatos (charity) and then stints at San Francisco, Oakland, and Davis. He graduated from Jackson Union High School, CA, in 1943 while living with his grandmother. He later graduated from the Southern Branch of the University of Idaho (two-year college) in 1945 while being enrolled in the Navy V-12 College Training Program. He immediately went into the Navy, sailing in such areas as Guam and Panama. He was discharged in June 1946 upon the end of the Second World War. He decided to enter graduate school at UC-Davis. During those years, he amused his plant pathology classmates by building a swimming pool on his mother’s property with borrowed farm equipment. He became an excellent swimmer and outdid all of us in diving for abalone along the central California coast.

Art received his Ph.D. degree in June 1959 and was immediately employed by the UC Division of Agriculture and Natural Resources as an extension specialist in the Department of Plant Pathology, Berkeley. His program responsibilities were in diseases of ornamentals and forest trees. His research interests ranged from foliage and root diseases of ornamental plants, to diseases of forest tree seedlings, to pitch canker of pines. He collaborated extensively with county farm advisors and U.S. Forest Service pathologists. These efforts resulted in numerous publications in California Agriculture, Phytopathology, and several forest service publications. He founded and served as editor of California Plant Pathology. He was widely respected by the ornamental industry and gave many presentations at grower meetings. In addition, Art collaborated closely with faculty and extension personnel at both Berkeley and Davis. A highlight was a joint Berkeley/Davis potato project on diseases at Tulelake, CA, with colleagues enjoying the hunting of migrating geese and ducks in off hours during the harvest season. Art did not care much about recognition and did not keep a detailed resume of his accomplishments. Academic records were lost with the demise of the department in the mid-1990s and many of his contributions are difficult to document. Art continued socializing upon his retirement in 1992 and had a happy hour at his home for his colleagues and friends every Wednesday. His legacy lives on as the Wednesday group still holds weekly get-togethers. Art is survived by his wife Elma Friesen McCain, son Arthur Hamilton McCain, and daughter-in-law Karen Tang McCain.

Prepared by Milton N. Schroth and Albert R. Weinhold, professors emeritus, former Department of Plant Pathology, UC-Berkeley, March 2017.
Assistant Professor of Plant Pathology
This is a 12-month, tenure-track position with 60% extension (Florida Cooperative Extension Service) and 40% research responsibilities. The incumbent will accrue tenure in the Department of Plant Pathology (Florida Agricultural Experiment Station), Institute of Food and Agricultural Sciences (IFAS) at the University of Florida (UF) and will be located at the Tropical Research and Education Center (TREC) in Homestead, FL. The appointee is expected to provide leadership for the Plant Diagnostic Clinic by analyzing plant samples submitted to the clinic, interacting with clientele and research/extension faculty to gather information necessary to accurately diagnose plant diseases/disorders and provide research-based management recommendations, developing new diagnostic methods for plant diseases/disorders, providing in-service training for extension faculty/clientele, participating in the Southern Plant Diagnostic Network through its regional center at UF, and supervising a laboratory technician. The research portion of this position focuses primarily on the diagnosis/management of diseases of ornamental and landscape plants. The successful candidate is expected to seek competitive funding to support research/extension programs. This position requires a Ph.D degree (foreign equivalent acceptable) in plant pathology, plant medicine, or a closely related field and a strong interest or experience in clinical diagnosis of plant diseases. Candidates should have good organizational and managerial abilities and demonstrated verbal and written communication skills, interpersonal relations, and procurement of extramural funding. Apply online at http://explore.jobs.ufl.edu/cew/en-us/job/501403 and submit an application, a cover letter that states applicant’s interest in the position and qualifications relative to the credentials listed above, a CV, contact for four individuals willing to write letters of recommendation, and university transcripts.

Field Crop Plant Pathologist
This assistant/associate professor position is a tenure-track, 12-month appointment with 85% research (Louisiana State University [LSU] AgCenter) and 15% teaching responsibilities (LSU College of Agriculture). The individual will be a faculty member of the LSU AgCenter Department of Plant Pathology and Crop Physiology. The individual should establish a nationally recognized, competitively funded research program in the area of field crop pathology that would include basic/applied components to address diseases of soybean and other Louisiana field crops. The incumbent will develop a research program addressing the most pressing disease problem(s) and conduct translational research to develop best disease management practices. The incumbent will develop their own area of specialization in plant pathology, collaborate with public/private sector scientists in related areas of study, teach introductory plant pathology, and contribute to other courses. The successful candidate also will be expected to fully participate in the departmental graduate program and serve as a major advisor and on advisory committees for Ph.D. and M.S. candidates. Extramural funding to support the research program must be secured. A Ph.D. degree in plant pathology or a closely related field is required. Apply online at https://lswd1.myworkdayjobs.com/LSU by attaching a cover letter with resume, including a statement of research interests/goals, a statement of teaching interests, university transcripts, and three letters of reference. Paper, faxed, or e-mailed application materials will not be accepted, except that in lieu of attaching the reference letters online, they may be sent directly to Christopher A. Clark, Department of Plant Pathology & Crop Physiology, 302 Life Science Building, LSU, Baton Rouge, LA 70803-0106; +1.225.578.1381; http://lsu.edu/ppcp.

Research Manager
Monrovia Nursery has an immediate opening for a self-driven, energetic research manager. Candidate will collect samples and conduct laboratory tests on water, soil, and plant tissues; diagnose and evaluate plant diseases/disorders and recommend preventative and curative treatments; and conduct research trials on all areas of nursery production. This is a great opportunity for a qualified candidate who enjoys conducting research trials related to growing the best woody ornamentals in the industry. Duties and responsibilities: maintain/operate an analytical laboratory for testing water, soil, and plant tissue samples; write/distribute reports of quality control testing; manage our domestic water system for the nursery and ensure compliance with the State of California Department of Health Systems; maintain accurate records and filing system of quality control testing to meet business needs; diagnose plant diseases/disorders and communicate with production personnel; write reports to communicate preventative and corrective recommendations for diagnosed disorders; maintain accurate records and filing systems of plant disorder diagnoses to meet business needs; evaluate and improve laboratory procedures associated with plant pathology to increase effectiveness and reduce laboratory cost; work with company management, production personnel, and others in evaluating current and new plant production processes; plan/conduct research trials related to all aspects of nursery operations that will improve product quality, improve product readiness, or reduce production costs; conduct trials according to generally accepted research protocols; write reports of research findings; train/assist other craftsmen in research duties, such as sample collection, sample preparation, data collection, data entry, research trial set-up and maintenance, and other activities. For additional job requirements and to apply online, please visit www.monrovia.com/about-us/horticulture-careers/for consideration.
Next MPMI Focus Issue Topic Announced

MPMI is now accepting submissions for the next Focus Issue: Effector-triggered Susceptibility. Authors, get the first six pages (plus one figure) free for the first 15 accepted papers. Submissions due June 15, 2017.

**Splicing Up the N Gene:** F. O. Holmes and Tobacco mosaic virus Resistance in Capsicum and Nicotiana Plants
Mark Mazzola and Shiri Freilich

**Isolation of Cultivation-Resistant Oomycetes, First Detected as Amplicon Sequences, from Roots of Herbicide-Terminated Winter Rye**
Matthew G. Bakker, Thomas B. Moorman, Thomas C. Kaspar, and Daniel K. Manter

**Phenazine-1-Carboxylic Acid Production by Pseudomonas fluorescens LBUM636 Alters Phytophthora infestans Growth and Late Blight Development**
Christopher K. Morrison, Tanya Arseneault, Amy Novinscak, and Martin Filion

**Perturbation of H3K27me3-Associated Epigenetic Processes Increases Agrobacterium-Mediated Transformation**
Hidekazu Iwakawa, Benjamin C. Carter, Brett C. Bishop, Joe Ogas, and Stanton B. Gelvin

**Virulence and Stump Colonization Ability of Armillaria borealis on Norway Spruce Seedlings in Comparison to Symptomatic Armillaria Species**
Renate Heinzelmann, Simone Prospero, and Daniel Rigling

**Reaction of Selected Cultivars of Sugar Maple to Anthracnose in North Alabama**

**Phytopathology**
Prospects for Biological Soilborne Disease Control: Application of Indigenous Versus Synthetic Microbiomes

Oomycete Species Associated with Soybean Seedlings in North America—Part I: Identification and Pathogenicity Characterization

Genomic and Transcriptomic Resources for Marker Development in Synchytrium endobioticum, an Elusive but Severe Potato Pathogen

**Plant Disease**
Sensitivity of Fusarium oxysporum f. sp. niveum to Prothioconazole and Thiophanate-Methyl and Gene Mutation Conferring Resistance to Thiophanate-Methyl

First Report of Bacterial Wilt Caused by Ralstonia solanacearum in Ornamental Rosa sp.

Parasitization of the Common Bean (Phaseolus vulgaris) by Meloidogyne ethiopica in Southern Brazil

**MPMI**
Current Understandings of Plant Nonhost Resistance

Type IV Effector Proteins Involved in the Medicago-Sinorhizobium Symbiosis

Rice Leaf Transcriptional Profiling Suggests a Functional Interplay Between Xanthomonas oryzae pv. oryzae Lipopolysaccharide and Extracellular Polysaccharide in Modulation of Defense Responses During Infection

**Plant Health Progress**
Incidence and Pathogenicity of Didymella americana on Table Beet in New York

Evaluation of Chipped Cankers for Management of Eastern Filbert Blight
### Calendar of Events

#### APS-Sponsored Events

**MAY 2017**

- **24** Webinar: Project Reporting and Writing Impact Statements. (11:30 a.m. CDT)  
  [www.apsnet.org/publications/webinars](http://www.apsnet.org/publications/webinars)

**JUNE 2017**

- **14-16** North Central Division Meeting. Champaign, IL.  
  [www.apsnet.org/members/divisions/nc](http://www.apsnet.org/members/divisions/nc)
- **27-29** Pacific Division Meeting. Riverside, CA.  
  [www.apsnet.org/members/divisions/pac](http://www.apsnet.org/members/divisions/pac)

**AUGUST 2017**

- **5-9** APS Annual Meeting. San Antonio, TX.  
  [www.apsnet.org/meet](http://www.apsnet.org/meet)

**OCTOBER 2017**

- **2-5** Caribbean Division Meeting. Termas de Chillán, Region del Biobío, Chile.  
  [www.apsnet.org/members/divisions/carib](http://www.apsnet.org/members/divisions/carib)

**NOVEMBER 2017**

- **1-3** Northeastern Division Meeting. Quebec City, Canada.  
  [www.apsnet.org/members/divisions/ne](http://www.apsnet.org/members/divisions/ne)

**JULY 2018**

- **29-Aug 3** 11th International Congress of Plant Pathology. Boston, MA.  
  [http://icpp2018.org](http://icpp2018.org)

#### Other Upcoming Events

**MAY 2017**

- **7-11** Population Genomics of Fungal and Oomycete Pathogens of Plants and Animals. Monte Verita, Ascona, Switzerland.  

**JUNE 2017**

- **5-9** 24th International Council for the Study of Virus and Other Graft-Transmissible Diseases of Fruit Crops. Thessaloniki, Greece.  
  [www.icvf.net](http://www.icvf.net)
- **18-21** Seventh International Conference on Algal Biomass, Biofuels, and Bioproducts. Miami, FL.  
  [www.algalbbb.com](http://www.algalbbb.com)

**JULY 2017**

- **17-20** Eighth International Workshop on Grapevine Downy and Powdery Mildew. Corvallis, OR.  

**DECEMBER 2017**

- **4-7** miCROPe 2017—Microbe-Assisted Crop Production: Opportunities, Challenges, and Needs. Vienna, Austria.  
  [www.microppe.org](http://www.microppe.org)

**MARCH 2018**

- **19-22** 9th International Integrated Pest Management (IPM) Symposium. Baltimore, MD.  

### Important APS Dates to Remember

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<td>15 Outstanding Volunteer Award nominations due</td>
<td>1 OIP Silent Auction donations due</td>
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<td>JUNE 2017</td>
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**15 MPMI Focus Issue submissions due**