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Phytopathology News

April 2021 Volume 55 • Number 4

APS Committee Renamed Committee for Diversity, Equity, and Inclusion

Breanne Kisselstein, Co-chair Committee for Diversity, Equity, and Inclusion

The Committee for Diversity and Equality (CDE) has been renamed the Committee for Diversity, Equity, and Inclusion (CDEI). Members and leaders of this committee voted for this change simply because the terms "diversity" and "equality" do not accurately describe the work that our committee is doing and is committed to doing in the future. Equality is defined by giving everyone equal resources and access, while equity is defined by giving everyone proportional resources and access according to their needs. As a simple example, although every member has equal access to hear a speaker at a meeting there may not be equitable access for deaf and hard-of-hearing individuals in the audience who cannot hear the speaker and need closed captioning or ASL (American Sign Language) interpreters. Furthermore, diversity is about representation, while inclusion is about involvement or having a seat at the table. A common but imperfect quote used to describe the differences between these two terms is, "Diversity is being invited to the party; Inclusion is being asked to dance."

CDEI is a very active committee that continually seeks to increase the diversity, equity, and inclusion of all members and APS leadership roles, and we are proud to change our name to demonstrate our commitment to these goals. We also hope to enhance the active enrollment and participation of members in our group, either as professionals from minoritized backgrounds or as our greatest allies. Please email **Breanne Kisselstein** with any questions, fill out an interest form to join our committee, and follow us on Facebook and Twitter! ■

Plant Health 2021 Online Preview: A Conversation with Keynote Speaker Professor Sheng-Yang He

Jim Bradeen, APS Internal Communications Officer

It started in a lab meeting one day. Mem bers of **Prof. Sheng-Yang He's** lab reported inconsistent results in seemingly replicated disease resistance assays in Arabidopsis. Dig ging more deeply, the variation was traced to the use of different growth chambers that varied in humidity control, raising the question, "Could variation in humidity result in such dramatic differences in disease resistance?" Meanwhile, a student interested in how light impacts plant disease resistance pivoted when she accidently observed that small changes in temperature can alter defense responses. (This student's project spawned a line of research in the He lab that demonstrated the vulnerability of salicylic acid-dependent defense responses to temperature fluctuations.) Collectively, these fortuitous findings caused Sheng-Yang to reflect anew on the "disease triangle" he learned about in his introductory plant pathology class. Taken to a global scale, Sheng-Yang began to wonder about how the environment, and especially climate change, impacts plant health and what this means for global agriculture.

Sheng-Yang will have a lot to say about climate change, plant health, and the future of agriculture during his Keynote Address, "Plant-Pathogen Warfare under Changing Climate Conditions," at Plant Health 2021 Online on Monday, August 2.

I asked Sheng-Yang how he got started in plant pathology. He shared that he grew up

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In This Issue

Phytopathology News

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PLANT PATHOLOGY'S PERPLEXING PAST: THE REST OF THE STORY

Bacterial Wilt of Alfalfa

Robert M. Harveson, University of Nebraska, Panhandle REC, Scottsbluff

Last month I shared the story of "wet rot" root disease of sugar beets; based on my research in the literature, it was the first example on the list of Gram-positive bacterial pathogens that seemingly originate in Nebraska agricultural production. Two University of Nebraska graduate students (**George Hedgcock** and **Haven Metcalf**) first discovered and characterized this disease in the early 20th century. This month's article concerns a different disease, bacterial wilt of alfalfa, caused by another Gram-positive bacterial pathogen, and its tale is the rest of the story.

Alfalfa Wilt

Alfalfa wilt, caused by *Clavibacter michiganensis* subsp. *insidiosus*, was first noted in the mid-1920s from the river valleys of Nebraska and Kansas and from fields in southern Wisconsin and northern Illinois as a distinct disease. However, it had likely been present, although unnoticed, in the United States for many years prior to that. By 1926, it had been reported from every major alfalfa-producing state.

Alfalfa plant (foreground) severely infected by bacterial wilt.

Symptoms and Conditions Favoring Disease

Alfalfa wilt is favored by cool, wet conditions, with an optimal pathogen growth temperature of 23°C, and surprisingly, disease will still progress at temperatures as low as 9°C. Infection often aggressively kills plants so rapidly that alfalfa crops become unprofitable 2–3 years following infection, and the disease rarely appears in stands under 3 years of age. Although infected plants normally die after the second year of infection, necrosis from annual growth rings showed that some infections had occurred at least 17 years prior to examination.

Irrigation also favors and increases infection, while fields cultivated under dryland conditions are seldom affected. The bacterium readily survives in infested plant material within soil, hay, or seed for several years and is most common in low, poorly drained areas of fields. Furthermore, the pathogen spreads throughout fields after injury to the crop, such as winter damage (freezing and thawing), insect feeding, or mowing and bailing hay.

Alfalfa's Origin and Introduction into North America

Alfalfa is the world's most important forage crop and is thought to have risen from two distinct centers of origin. One of these is the mountainous highlands of Transcaucasia and adjacent areas of northwestern Iran; a second, independent origin is believed to be Turkestan and other parts of central Asia. Alfalfa was likely brought to the southwestern United States (Texas, California, New Mexico, and Arizona) via Mexico by Spanish missionaries in the 1500s after previously being introduced into Central and South America by Spanish explorers. It became very successful in the western United States, but not in the northeast or midwest, likely due to its lack of winter hardiness (or disease resistance).

Research Begins

Through the 1920s, alfalfa acreages in Nebraska decreased dramatically. Experiment station plant pathologist **George L. Peltier** was one of the first plant pathologists to study the disease and concluded that wilt was the primary factor responsible for this sudden decline in alfalfa production. In fact, there was enough concern that the Nebraska Legislature created a special appropriation of $25,000 for conducting research (equaling more than $350,000 today).

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in China and witnessed firsthand how devastating challenges like rice blast and cotton boll weevil can be for plants, farmers, and those who rely on healthy crops. In graduate school, he studied plant pathology at Cornell University. He has built a successful and celebrated career working on Arabidopsis, its interactions with pathogens (especially bacterial pathogens), and molecular mechanisms in both plant and pathogen. However, he has never forgotten his agricultural roots or the importance of his research for solving plant health problems.

Now at Duke University, Sheng-Yang and his lab group are exploring how environmental variation—in humidity and temperature, as well as in nutrition and CO_2 levels—impacts plant health, plant defense responses, and pathogen biology. In an increasingly volatile global environment, this is a field ripe for research. Sheng-Yang indicates that all we have learned as a scientific community in recent decades about both host and pathogen means we can now tackle environmental variation, the third side of the disease triangle, with renewed research vigor.

I asked Sheng-Yang for his advice for those just starting out in plant pathology. He indicated that one of the strengths of our discipline is the diverse perspectives it brings. Given his fortuitous foray into his current line of research, it should be no surprise that he encourages students and early-career professionals to focus on the big picture and to think about how our research impacts the real world. Sheng-Yang offered, "Plant pathology is a fascinating field. Once people begin to see the breadth and depth of the field, they are excited," and he sees a future for our discipline that intersects with other fields of study, from chemistry to engineering to informatics.

So, what can we expect from Sheng-Yang's Keynote Address? It's going to be exciting! We will hear about some recent and ongoing research from his program. We will be challenged to think about our own research and how it fits into the future of agriculture; how genome editing can be leveraged for plant health; the importance of crop wild relatives to sustainable agriculture; and new strategies for disease management. You won't want to miss this one! Tune in on Monday, August 2, for Prof. Sheng-Yang He's Plant Health 2021 Keynote Address, "Plant-Pathogen Warfare under Changing Climate Conditions."

Learn more about Sheng-Yang He and other Keynote and Plenary presenters. ■

Annual Financial Report

Annual Audited Summary of APS Finances for Fiscal Year 2020

Lawrence Datnoff, APS Treasurer, ldatnoff@agcenter.lsu.edu

The Financial Advisory Committee (FAC) and APS staff meet routinely to review financial matters related to the operation of the society and to refine the APS strategic financial plan. FAC, staff, and the leaders of APS business centers (e.g., APS PRESS, APS Journals) update and revise the strategic financial plan annually to ensure that funds are available to support all activities of the society. APS Council and the officers regularly analyze the external environment and make progress toward developing and executing strategies to attain the goals of the plan. Having a strategic financial plan helps us provide a focus for our resources and a prioritization of activities. Identifying strategic targets informs everyone as to what is expected from their programs several years in advance, so they can build and execute strategies over several budget cycles. The role of FAC in this process is not to be involved directly in program-specific strategy building, that is council's responsibility, but rather to develop financial goals, build business plans to meet those goals, and monitor progress toward each goal. FAC continually asks the difficult questions, such as which programs should break even and which are expected to generate a surplus to invest in the scientific programs and professional services that best benefit our members. These dovetailed strategic plans continue to work for the society, allowing us to envision and invest in our future.

At times, FAC and council must make decisions that protect the financial well-being of our society. The outbreak of COVID-19 impacted organizations around the world, and APS was no exception. Although APS was able to leverage its position of strength and reserves that were generated from its consistent financial performance, the pandemic brought uncertainty to projections for our revenue streams and led us to reevaluate the financial strategies that were in place. As a consequence, APS staff, along with FAC and council, carefully evaluated the paycheck protection program (PPP) (a business loan program established in 2020 as part of the U.S. Coronavirus Aid, Relief, and Economic Security Act to help qualifying businesses) as a means

Financial Report, continued on page 4

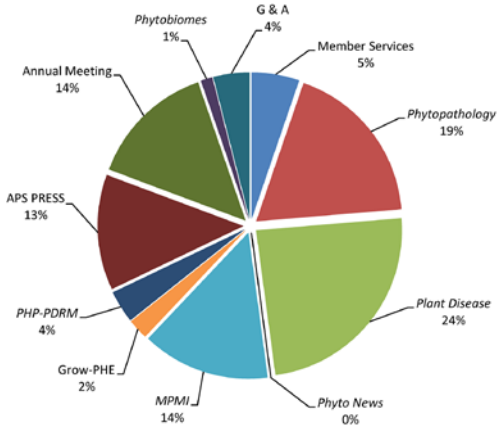

Fig. 1. *Audited Income—6/30/20.*

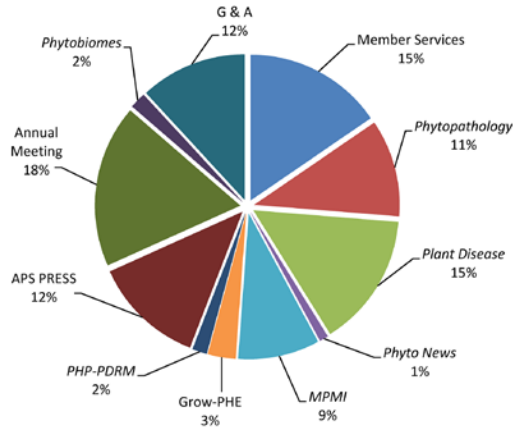

Fig. 2. *Audited Expenses—6/30/20.*

Financial Report, continued from page 3

to weather the potential financial storm brought on by COVID-19 and successfully obtained a forgivable loan in April 2020. The PPP loan allowed us to cover a set portion of staff and building expenses. The amount of the loan was $821,300; this benefited not only APS but also our Scientific Societies cooperative partners. APS received a proportionate share of the loan in the amount of $310,000. In August, staff applied for loan forgiveness, and this was granted in November 2020. Council, FAC, and APS staff will continue to evaluate programs and strategies and pivot when appropriate to support the financial health of our society.

To help APS continue to invest in the future (e.g., start-up costs for new journals that allow increased opportunities for member publication), as well as maintain established non-revenue-generating programs (e.g., advocacy and outreach), the society maintains an operating reserve that will cover one year of operating expenses. Keeping a strong operating reserve allows us to weather financial downturns and economic shifts, as previously mentioned, by providing a cushion against unexpected events, losses of income, and any large unbudgeted expenses. The financial reserve also gives us the ability to invest in ourselves as opportunities present themselves or member needs change. The interest revenue generated from the reserves is utilized to innovate and create new member value.

Fiscal year 2020 (FY20) (excluding investments) was concluded with an operational surplus of $317,807. The FY20 income and expense categories for the society are detailed in Table 1. Total income of $5,629,985 was derived from 11 sources, as indicated in Figure 1, and total operating expenses ($5,312,178) were partitioned as indicated in Figure 2. APS income and expenses for the most recent 11 fiscal years are presented in Table 2. The total assets of the society as of June 30, 2020 (including restricted funds), were $9.9 million, and liabilities totaled $2.2 million. This resulted in total net assets of $7.7 million. ■

Table 2. Comparison of APS FYs 2010–2020 Before Reserve Allocation

Fiscal Year	Net from Operations	Net Income/(Loss)
FY10	$544,187	$255,244
FY11	($209,289)	$546,859
FY12	$457,305	($1,125,124)
FY13	$269,385	$744,885
FY14	$605,307	$1,323,776
FY15	$54,497	$930,286
FY16	$557,417	($1,019,504)
FY17	$426,789	$1,617,466
FY18	$370,228	$1,183,334
FY19	$860,528	$1,035,060
FY20	$317,805	$452,077

Table 1. Audited Summary of Income and Expenses—6/30/20 (12 Months)

	Income		Expenses		Net Before Overhead	Net After Overhead
Member Services	296,783	5%	821,990	15%	(525,207)	(617,362)
Phytopathology	1,036,318	18%	573,092	11%	463,226	417,913
Plant Disease	1,362,106	24%	790,559	15%	571,547	505,825
Phyto News	120	0%	51,382	1%	(51,262)	(59,930)
MPMI	798,678	14%	480,998	9%	317,680	267,655
Grow-PHE	127,296	2%	164,042	3%	(36,746)	(54,741)
PHP-PDRM	201,856	4%	86,676	2%	115,180	103,860
APS PRESS	719,278	13%	658,026	12%	61,252	15,582
Annual Meeting	790,150	14%	959,246	18%	(169,096)	(225,468)
Phytobiomes	71,930	1%	95,014	2%	(23,084)	(35,527)
G & A	225,470	4%	631,153	12%	(405,683)	0
Total	**5,629,985**		**5,312,178**		**317,807**	**317,807**
Surplus (Loss)	317,807					

Call for Volunteers

Make things happen, engage in APS!

Several leadership opportunities are available within APS. Visit the APS website to learn more about these open positions. ■

Graduate Students: Apply to be Featured in *Phytopathology News*!

For each issue of *Phytopathology News*, the APS Graduate Student Committee chooses a graduate student to be featured in a spotlight article. Applicants are chosen based on their involvement in APS as student members and their expected graduation dates. The committee strives to integrate students into society affairs and activities and recommends ways to address student concerns. Submit your application for consideration on the submission webpage. ■

Perplexing Past, continued from page 2

In 1930, Peltier published the first comprehensive report on alfalfa wilt in *Nebraska Agricultural Experiment Station Bulletin 240*. He stated that the disease was identified in mature plants from fields containing alfalfa stands that were at least 35 years of age, suggesting that it was not a new disease in the state but only recently recognized in the 1920s. He also concluded that previous losses from wilt were very likely attributed falsely to winter injury. He further determined that the disease caused the greatest damage in the irrigated valley fields grown for hay and those where productive stands were needed for extended, indefinite periods. Lastly, Peltier asserted that the disease occurred in virtually every irrigated field in Nebraska over 2 years of age.

Registration Certificate

IMPROVED CROP VARIETIES

Alfalfa

Ranger developed by the Nebraska Agricultural Experiment Station and the United States Department of Agriculture

Accepted by the Committee on Varietal Standardization and Registration this 15th day of December, 1944, under Registration Number 1

American Society of Agronomy — Committee member

U.S. Bureau of Plant Industry, Soils, and Agricultural Engineering — In charge of registry

Certificate of registration for alfalfa variety 'Ranger' developed by the Nebraska Agricultural Experiment Station and the USDA.

Breeding and Development of Disease-Resistant Cultivars

By 1930 bacterial wilt was recognized as the most significant problem in alfalfa production in the United States, revealing the immediate need to identify new methods for control of this emerging disease. The U.S. Department of Agriculture (USDA) and several state agricultural experiment stations began work evaluating multiple methodologies. Genetic resistance was concluded to be the only practical method available to solve the problem rapidly.

None of the domesticated cultivars being used at that time possessed disease resistance. Thus, USDA plant explorers searched over much of the world, looking for alfalfa sources with resistance. Fortunately, disease-resistant alfalfa germplasm was found in Turkestan, and breeders successfully combined it with desired agronomic properties. George Peltier, partnered with **H. S. Tysdal** of the USDA and the University of Nebraska Department of Agronomy, developed the first winter-hardy, wilt-resistant variety, 'Ranger', and it was released for commercial production after 1940. It was the first alfalfa cultivar that utilized a specific gene derived from a foreign source for disease resistance and winter hardiness, and it served as an industry standard for decades.

Yield of alfalfa variety 'Ranger' (left) compared with a different cultivar (right)

Conclusions

Development of resistant varieties through breeding has effectively neutralized the alfalfa wilt pathogen and has almost completely eliminated the disease as a threat to production. This resistance has continued to persist even as new cultivars have been developed more than 80 years after the development of 'Ranger'. Now you know *the rest of the story*.

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plant health 2021 online

Seismic Shifts in Disease Risk

August 2–6, 2021

Submit Your Abstract to Plant Health 2021 Online

Share your research with plant pathologists from all over the world at this year's annual meeting!

Your abstract should clearly describe the importance of your work to plant pathology, your objectives, methods, and results. Find more details regarding virtual presentation formats at planthealth2021.org.

Abstract submission closes April 15.

planthealth2021.org

OPRO Meets Alyssa Koehler

Alyssa Koehler is an assistant professor and plant pathology extension specialist from the Department of Plant and Soil Sciences within the University of Delaware.

***Science outreach activity*:** Plant Pathology Private Eye.

Type of event: Workshop.

***Intended audience*:** K-12 students. The level of difficulty can be adjusted as needed.

***Description of the activity*:** This activity was originally created for a STEM outreach event for 6th- to 8th-grade girls. Students were split into groups and received a clue describing a type of crop. Once they figured out their host, they went to the appropriate station to pick up their "case file," which included relevant pictures, workbooks, a fungal culture and infected plant, and the answer to their DNA band-size mystery in a sealed envelope. The activity booklet introduced the mystery, guided them through using a wooden microscope to look at some aspect of their pathogen (hyphae, sclerotia, etc.), and provided instructions on PCR and loading a gel to find out the DNA size of their organism. After practicing loading a gel, they opened their sealed envelope to find a preprinted gel image that they then matched to an image on a large poster to officially "solve" their mystery.

Case files and the workbooks within. Each student received a workbook. We developed materials for watermelon, corn, wheat, and lima bean so that each small group had a different mystery. The groups all shared their findings with the larger group at the end of the activity.

Materials within one case file.

***Materials needed for this activity*:**

- Each case file included:
  - Host booklets (created for watermelon, corn, lima bean, and wheat).
  - Petri dish, flask, or inoculated plant (something to offer a visual of the disease).
  - Pictures of symptoms and diagnostic features.
  - Sealed envelope with gel-band picture.
- DNA Database poster with flip-style images, so participants can match the picture in their sealed envelope with the correct pathogen gel band.
- Optional: Cardboard cutouts of hosts to have as the "home base" of the stations.
- Optional (depending on budget): Each microscope package included:
  - Echo wooden microscope (cost $10 per scope; these come as a flat sheet, and students assemble their own microscope; a cell phone camera was used to take photos. In this activity, the microscope was a "goody" that the students were able to take home).
  - Slides.
  - Cover slips.
  - Dropper bottle of water.
  - Probe or forceps.

Case file and DNA Database poster. The gel images flipped up and revealed "Sorry not correct" or "Congratulations" messages and information about the disease.

- For practicing loading a gel:
  - Premade gel in a plastic storage container filled with water.
  - Loading dye.
  - Pipette.
  - Tips.
  - Container with water for gels or nearby sink.
  - Paper towels.

***For information regarding this event*:** The materials for this activity are available upon request from Alyssa Koehler.

How will you modify or improve future offerings? The event went smoothly. The main challenge for hosting this event additional times has been COVID-related restrictions.

How many times has this activity been hosted? Once.

In total, how many participants have been in attendance? 65 students.

To have your science outreach activity or event featured in the "OPRO meets…" article series, please complete this survey. ■

Early Career Internship Applications Are Now Being Accepted by PPB

The APS Public Policy Board (PPB) is committed to developing future leaders to engage in science policy that relates generally to agricultural science and specifically to matters of interest to APS. Through the PPB Early Career internship program, interns experience many sides of policy making, including helping to identify advocacy issues and learning how scientific societies, nongovernmental organizations, executive branch agencies (e.g., USDA, NSF, EPA), and the legislative branch interact in crafting public policy. Some of the benefits of the internship are honing communication and leadership skills and building connections with scientists and administrators from academia, industry, and government.

This internship is open to APS early career members, which includes current graduate students, postdoctoral associates, and junior professionals. The PPB early career intern will participate in PPB activities from August 2021 to August 2023. In the first year of the internship, the intern will be expected to participate in monthly PPB calls and in the preparation of newsletter items and policy white papers. At the end of the internship, the intern will prepare a written and/or oral report on the experience for delivery to PPB and the APS membership. Other activities may include, but are not limited to, meetings to establish the PPB policy agenda-setting; development, tracking, and analysis of policy issues; planning Capitol Hill and agency briefings; and updating and presenting the PPB booth at the APS Annual Meeting.

Application materials and a further description are available online. Completed application materials must be received by **May 15, 2021**, and should be sent to **Rick Bennett**, PPB chair. ■

Application Deadlines Approaching for APS Foundation Awards

Applications are being accepted through **April 15, 2021**, for the following awards:

International Travel Award

Provides support for early- to mid-career international APS members to participate at Plant Health 2021 Online or at an APS 2021 virtual workshop.

Named Student Travel Awards

Provides support to APS student members who submit an abstract and give an oral or poster presentation at Plant Health 2021 Online.

John and Ann Niederhauser Endowment Award (JANE)

Supports international cooperation on a project between a person or institution in the United States and a person or institution outside the United States.

OIP Global Experience Award

Helps APS plant pathologists working with scientists and extension personnel in developing countries in training and outreach efforts. For 2021, funds will be used for virtual workshops.

Give to the APS Foundation
apsnet.org/GIVE

Ensure a bright future. Through your donations, the APS Foundation provides support to students and scientists and helps underwrite special programs and projects in plant pathology. ■

Technology and Tools Webinar Series—Call for Topics!

In an effort to help professionals remain abreast of ever-evolving technologies available for research, the Mid-Career Task Force will host a series of webinars. We are seeking speaker nominations, either yourself or someone else, whose research techniques are on the forefront of science. We also welcome submissions for technologies that you'd like to learn about but for which you have no presenter in mind.

We are interested in tools or technologies that are pioneering how research is conducted in either applied or molecular plant pathology—or from a related field that can be leveraged into plant pathology.

The webinar format is flexible, allowing for video tours of equipment or live demonstrations of techniques (if desired).

Topic submissions were due April 5, but we welcome any last minute ideas by **Friday, April 9**. Contact apshq@scisoc.org if you have any questions about this initiative or you are interested in joining the Mid-Career Task Force. ■

plant health 2021 online

August 2–6, 2021

Seismic Shifts in Disease Risk

Live and On Demand

Save the Date!

Join plant pathologists from around the world to explore major changes in bacterial, viral, nematode, and fungal pathosystems that help us anticipate and deflect future shifts in disease risk.

Registration Opens in Early May

APS Members receive a discount on registration! | planthealth2021.org

PDMR, Volume 15, Now Available with 382 New Efficacy Reports

PDMR
Plant Disease Management Reports

The biannual APS publication *Plant Disease Management Reports* (*PDMR*) facilitates the rapid dissemination and archiving of information on cultural, chemical, and biological control of plant diseases. The latest volume, now complete, includes 382 reports. The reports are divided into seven sections:

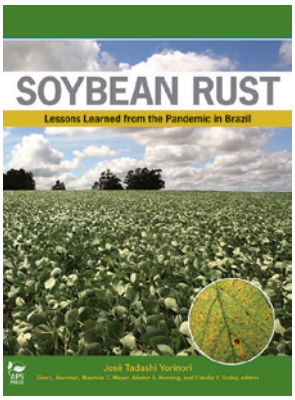
Tropical, Vegetable, and Miscellaneous Crops
Field, Cereal, and Forage Crops
Nematicides (all crops)
Ornamentals and Trees
Pome Fruits, Citrus, Small Fruits, Stone Fruits, and Nuts
Seed Treatments (all crops)
Turfgrass

Search reports by section or search all Volume 15 reports.

Submit to the Next Issue of Volume 15!

Learn about the submission process and review a sample report. Then submit your own report when the next submission period opens on April 12, 2021. ■

The Life and Research of José Tadashi Yorinori, the "Father of Soybean Pathology in Brazil"



New APS Book Highlights the Importance of Plant Pathology Worldwide

Soybean rust—perhaps the most feared and studied of all soybean diseases—was first reported in Japan in 1902. It spread slowly, initially impacting only countries in the Eastern Hemisphere, from Japan south to Australia and west to China and India. In the 1990s, the disease was reported in Hawaii and many African countries. Next, it moved to the Americas: to Paraguay in 2001, to Brazil in 2002, and, finally, to the continental United States in 2004.

If left unchecked, soybean rust can cause yield reductions of up to 80%, according to **Glen Hartman**, a USDA–ARS research plant pathologist at the University of Illinois at Urbana–Champaign who focuses on soybean diseases and pests. He describes the development of soybean rust as "explosive under the right conditions—in just a week or two after the first diagnosis of soybean rust in a field, it can become an epidemic nightmare, producing billions upon billions of aerial-dispersed spores."

Hartman is one of the editors of *Soybean Rust: Lessons Learned from the Pandemic in Brazil*, the newest title from APS PRESS. This book was written by the late **José Tadashi Yorinori**, a pioneering researcher who "had the foresight to study rust before it was a problem in Brazil," according to Hartman, and then spent 10 years struggling to bring the disease under control. Yorinori's research and collaborations provided growers with "on-the-spot information about how to diagnose, manage, and reduce the impact of soybean rust," in Hartman's words. This important work "laid the foundation for rust management in Brazil and other countries."

Known to many as the "father of soybean pathology in Brazil," Yorinori found his way to plant pathology through the course of his life experiences. The fourth of seven children, he spent his childhood on his family's farm and small coffee plantation near Londrina in Paraná State, Brazil. As a youth, he biked to the cinema to see films

about the Wild West, which led to his growing fascination with the United States.

In 1967, Yorinori began studying agronomic engineering at Paraná Federal University. He saw an opportunity to realize his dream of attending school in the United States when he came across a poster announcing a study program that included a scholarship. When Yorinori arrived in the United States, he was surprised to find that instead of being accepted into an internship program, he actually had been accepted into a master's course in phytopathology at Cornell University. After completing his master's degree, he dedicated his professional life to the study of plant diseases.

In 1970, Yorinori began his career at the Meridional Agricultural Research Institute in Brazil, where he conducted his first studies on soybean diseases in Paraná State. From 1973 to 1976, he worked at the Paraná Agronomic Institute (IAPAR) as a research scientist and coordinator of the Paraná State Soybean Research Program, and he helped establish the Soybean National Research Center (CNPSo), now known as Embrapa Soja. Eager to improve his professional skills, Yorinori returned to the United States in 1977 to complete a Ph.D. degree in plant pathology at the University of Illinois at

Soybean Rust, continued on page 11

Soybean Rust, continued from page 10

Urbana–Champaign. He also continued to work with researchers at CNPSo/Embrapa to study the chemical control of soybean diseases and the development of resistant cultivars.

The research that Yorinori conducted across 30-plus years provided critical training materials for technical staff and farmers on the management of soybean diseases both in Brazil and worldwide. Yorinori published more than 1,000 technical reports and papers and oversaw exchange programs with technicians from South America, Mexico, and the United States. He also participated in several technical committees of the World Soybean Research Conference and other organizations.

Yorinori's most significant contribution to the management of soybean rust was the development and implementation of a program called the *vazio sanitário* (sanitary void), which requires farmers to maintain a 90-day period free of soybeans before the next summer planting, thereby reducing the overseason production of spores by the causal fungus. First applied in Mato Grosso State, Brazil, in 2006, this program is currently adopted by all the soybean-producing regions in Brazil and allows much greater efficiency in soybean rust control.

After retiring from Embrapa Soja in 2007, Yorinori started a consulting business and served as a technical–scientific advisor for a range of research institutions, producers' associations, and agrochemical companies. He also worked on a book about soybean rust, drawing on his many years of consistent notetaking, persistent documentation of facts and activities, ongoing communication with the greater community, and skillful photography. He had nearly completed the book when he died in 2016 after falling at home.

Dedicated to having his book published, Yorinori's family contacted his former colleague **Don Huber**, emeritus professor at Purdue University. Huber brought the project to APS PRESS, and a final round of edits and updates was completed by Glen Hartman and Embrapa researchers **Maurício Meyer**, **Ademir Henning**, and **Cláudia Godoy**.

When asked how Yorinori's work in Brazil translates to the greater world, Hartman responded, "His work provides insights into soybean production in Brazil and the unfolding of the soybean rust pandemic. He also documents the story of a 10-year struggle to get soybean rust under control, including his struggle to understand soybean rust and his success to overcome barriers brought about by lack of knowledge. The lesson for the 'greater world' is based on Dr. Yorinori's persistence to educate as many people as possible for the greater good of all."

Soybean Rust: Lessons Learned from the Pandemic in Brazil is now available in the APS PRESS bookstore. Hartman recommends it as "a good read" for both experienced and novice plant pathologists interested in one of the greatest epidemics ever documented. ■

APS Foundation

Donors of Distinction

Give to the APS Foundation
apsnet.org/GIVE

Meet some of the amazing people who support APS Foundation. Learn more about who they are and why they give their time and resources to support others.

Erica Goss

APS has been my professional community for nearly 15 years, and I am happy to support the APS Foundation, as I do organizations in my local community. I began giving to the APS Foundation because it has supported me and my students through multiple awards. The value of APS Foundation support and recognition has only become more apparent to me over the course of my 10 years as a faculty member. Like many, I re-evaluated my priorities in 2020 and looked to specifically support equity, diversity, and inclusion initiatives that aim to strengthen my communities. I was happy to see the recent announcement of the Lafayette Frederick Diversity in Mentoring Award, and I am excited to contribute to its success.

***Erica Goss** is an associate professor of plant pathology at the University of Florida.*

R. James Cook

When I think of the good the APS Foundation has done for APS and APS members, the ever larger group of graduate students at the annual meeting supported by named student travel funds comes immediately to mind. Created in 1995, the establishment of a student travel fund named after a mentor, deceased colleague, or other person of imporance to the donor was, and remains, the foundation's most popular fundraiser. I started a student travel fund named after **K. F. Baker**, my mentor and coauthor of our two books on biological control of plant pathogens. I later doubled the fund and renamed it the Baker-Cook Student Travel Fund. The most rewarding part is the thank you letters I get from students supported by this fund telling me about themselves, their thesis research, and their future plans.

Donors, continued on page 12

Donors, continued from page 11

My other reflection, now as an emeritus member of APS, is the unlimited opportunity I had to develop leadership skills and meet and work with outstanding plant pathologists. During the second or third year in my job with USDA–ARS at Washington State University, Pullman (1967 or 1968), I was appointed as one of seven APS members, each just starting our career, to the APS ad hoc New Ideas Committee. Presumably, we were appointed to this committee because we were relatively new to APS and, therefore, could be expected to take a fresh look at the society. Three of us—**Wiley Garrett**, **Paul Williams**, and I—would go on to serve as president of APS.

Our charge was to come up with ideas on how to strengthen APS as a professional scientific society representing plant pathology specifically and the food and agriculture sciences more generally. I recall two main recommendations: start a second journal for applied plant pathology and establish a presence in Washington, DC. Ten years later, in June 1978, I would find myself chair of a committee to design and launch *Plant Disease* as the replacement for *Plant Disease Reporter*. One year later, in July 1979, under the able guidance of **Miles Wimer**, director of APS Publications, the inaugural issue, dated January 1980, containing feature articles, original research reports, and more, was widely distributed to potential subscribers six months early to make sure APS had a startup list of subscribers when January 1980 rolled around.

The other recommendation of the New Ideas Committee was to establish a presence in Washington, DC. This recommendation would start to take shape in 1991 when **President George Agrios** appointed **Arthur Kelman**, **Anne Vidaver**, **Sue Tolin**, **Luis Sequeira**, **Cliff Gabriel**, and me to the new National Plant Pathology Board (NPPB). Our charge was to introduce offices and committees of the executive and legislative branches of the federal government to APS and the information and services the members of our society could provide if requested. The NPPB would become the Public Policy Board, with Eversole Associates employed for a short time as a consulting service. As a result, APS has become one of the best known and most effective sources of information to the executive and legislative branches of government of the scientific societies representing food and agriculture.

In 1982, **Ray Tarleton**, APS executive vice president, acquired the publication rights to Ken Baker's and my first book, *Biological Control of Plant Pathogens*, which the publisher, W. H. Freeman and Co., San Francisco, CA, had allowed to go out of print. This led Ken Baker and me to submit our second book, *The Nature and Practice of Biological Control of Plant Pathogens*, for publication by APS. As it was pre-APS PRESS, our book was handled by the APS Books Committee, one of several committees that made up the APS Publications Committee. Finding the review process for our manuscript lacking, I shared my concerns with Ray Tarleton and **Steve Nelson** while on our way by car to the 75th APS Annual Meeting in Ames, IA. I was president elect at that meeting, which meant my first meeting as president was to chair the final meeting of APS Council. My first order of business was to share the discussion that Tarleton, Nelson, and I had about the need to reorganize the APS Publications Committee and possibly have its own editor-in-chief. I appointed **Al Weinhold** to chair an ad hoc committee and come to the next meeting with a recommendation on reorganizing the process by which to handle nonjournal publications of APS. This led to approval by council of the formation of APS PRESS at the 76th APS Annual Meeting in Guelph, ON, Canada.

My latest service with more great memories was, after I retired, two 3-year terms on the Board of Directors of the APS Foundation, from August 2009 to August 2015, under the able chairmanships of long-time friends **George Abawi**, **Ray Martyn**, and **Bill Dolezal**, respectively. The highlight of my time on that board was to chair selection of the annual recipient of the Raymond J. Tarleton Student Fellowship. Ray was a good friend, and it was an honor to represent him in selecting receipts of this fellowship.

I cannot complete "My Story" without remembering the scores of APS members with whom I had the pleasure of working and who became my friends and my wife's friends. Representing more than 60 years since I became an APS member as a graduate student, and more than 50 years since I served on my first APS committee, many of these colleagues sadly are now gone, but by no means are they forgotten. ■

People

Degrees

Alexandra Feltmeyer received her M.S. degree in plant pathology from the University of Minnesota in October 2020. Her thesis was titled, "Characterization of Injection Wound Damage Associated with Propiconazole Treatment of Northern Pin Oak." Her research revealed a significant difference in tree host response based on application methodology used to deliver the systemic fungicide to the functional xylem. In contrast to a macroinfusion method, the microinjection technique resulted in significantly longer external cracks and lower percent injection wound closure 25 months after treatment. However, efficacy of disease suppression did not differ by injection method over the same period. Feltmeyer's committee included her coadvisors **Jennifer Juzwik** and **Brett Arenz**, as well as **Gary Johnson**. Born and raised in Wisconsin, Feltmeyer obtained her B.S. degree in urban forestry from the University of Wisconsin–Stevens Point. She accepted a forest health specialist position with the Wisconsin Department of Natural Resources in October 2018. In addition, Feltmeyer enlisted in the Wisconsin Army National Guard in February 2020 and is attending Officer School to become a commissioned officer in October 2021.

Zachary Noel received his Ph.D. degree in plant pathology and evolutionary ecology biology and behavior from Michigan State University. During his Ph.D. studies, he worked under **Martin Chilvers**, researching the effect of soybean seed treatments on oomycete diversity and evolution. This research was aimed at understanding fungicide-resistance evolution and species selection in oomycete communities associated with soybean. This research improved knowledge on the breadth of soybean seed treatment activity against soybean-associated oomycetes and moving toward prescription seed treatments. Noel then joined **Drs. Gregory Bonito** and **Frances Trail** at Michigan State University to perform postdoctoral research. In these mycology labs, Noel's research focused on the long-term impacts of crop management combined with fungicides

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on the corn, soy, and wheat microbiomes. In October 2020, Noel joined the Entomology and Plant Pathology Department at Auburn University as an assistant professor of plant health and microbiomes. At Auburn University, his lab focuses on the assembly of seed and seedling microbiomes, with and without pathogen pressure, and understanding how agricultural management strategies alter the complexity and resiliency of microbial communities.

Despite restrictions to research due to the COVID-19 pandemic, seven graduate students were able to complete the requirements for their respective degree programs in the Department of Plant Pathology at the University of Georgia in 2020.

Amelia Lovelace completed her Ph.D. degree, under the direction of **Brian Kvitko**, with a dissertation titled "Genome-wide Bacterial Response to Plant Innate Immunity." While pursuing her degree, she was awarded the Kenneth E. Papa Outstanding PhD Student Award and was the recipient of a USDA–NIFA Pre-Doctoral Fellowship. She also served as the chair of the APS Graduate Student Committee. Currently, Lovelace is a postdoctoral associate in the lab of **Wenbo Ma** at the Sainsbury Laboratory at Norwich Research Park in the United Kingdom.

Bennett Harrelson defended his M.S. thesis, "Assessment of Quinone Outside Inhibitor Sensitivity and Frogeye Leaf Spot Race of *Cercospora sojina* in Georgia Soybean," with **James Buck**. Harrelson won first place in the Graduate Student Paper competition of the Southern Soybean Workers Annual Meeting in 2020.

Kasmita Karki graduated with an M.S. degree under the direction of **Bhabesh Dutta** and **Abolfazl Hajihassani**. Her thesis focused on "Management of *Fusarium oxysporum* f. sp. *niveum* and *Meloidogyne incognita* in Watermelon." Karki was awarded a Corteva Travel Award to attend the Society of Nematologists Annual Meeting in 2019.

Nicole Crenshaw completed her M.S. thesis, "Host-Induced Gene Silencing of the Fungal Cytochrome p450 Lanosterol c-14a-Demethylase (*cyp51*) Could Confer Resistance to *Fusarium verticillioides* in Maize," under the direction of **Scott Gold** and **Anthony Glenn**. She is now employed as a microbiologist for the USDA Food Safety Inspection Service (FSIS).

The Masters of Plant Protection and Pest Management (MPPPM) is a comprehensive interdisciplinary nonthesis degree program in plant protection. Three students in the plant pathology graduate program successfully completed the requirements for the MPPPM degree in 2020. Graduates **Chelsea Matewe**, **Seth McAllister**, and **Patrick Triana** were advised by **Jonathan Oliver**, **Bob Kemerait**, and **Sudeep Bag**, respectively.

New Position

Devanshi Khokhani joined the Department of Plant Pathology, University of Minnesota–St. Paul, August 31, 2020, as a tenure-track assistant professor specializing in plant-associated bacteria, with research and teaching responsibilities. Khokhani received her Ph.D. degree in microbiology from the University of Wisconsin–Milwaukee, where she studied the effects of plant phenolic compounds on the type three secretion system in *Erwinia amylovora* and *Dickeya dadantii*. She has also studied the role of quorum sensing in differentially regulating virulence factors of *Ralstonia solanacearum* as a research associate in the Department of Plant Pathology at the University of Wisconsin–Madison. Apart from pathogenic bacteria, she studied multitrophic interactions involving nitrogen-fixing bacteria, mycorrhizal fungi, and crop plants as an assistant scientist in the Department of Bacteriology at the same university. Her research at the University of Minnesota will focus on bacterial pathogens important to Minnesota agriculture, such as *Clavibacter michiganensis* subsp. *nebraskensis*, the cause of Goss's wilt and blight of corn. She is interested in understanding how this Gram-positive bacterium makes it to the xylem vessels of corn and determining the key nutrients that the pathogen thrives on inside the plant. Her long-term research goals are to enhance plant health and develop sustainable strategies for increasing crop yield.

Obituaries

Dr. Kenneth L. Deahl, USDA–ARS research plant pathologist, who retired from the Genetic Improvement of Fruits and Vegetables Laboratory, Beltsville, MD, in 2013, passed away on January 27, 2021.

Ken was born in Pikeville, KY, in 1943 and grew up in Fairmount, WV, where, at an early age, he developed a love of plants, as well as of hunting and fishing. He graduated with honors in biology and animal science from Fairmount State College, Fairmount, WV, in 1965. Ken continued his education at West Virginia University, where he received his master's degree in plant pathology and plant biochemistry and went on to carry out research under the supervision of **Mannon Gallegly** for which he was awarded a Ph.D. degree in 1971 for his dissertation, "Laboratory Testing of Potato Tubers for Multigenic Resistance to Late Blight." During this research, he developed techniques to quantify the glycoalkaloid content of potato tubers, later adopted as part of the process of evaluating clones from breeding programs for their suitability for commercial production.

This led Ken to be recruited to join the USDA–ARS, Vegetable Crops Laboratory at Beltsville, MD, in 1971, where his research emphasized the role of glycoalkaloids in resistance to *Phytophthora infestans* in tubers of both commercial potato varieties and wild *Solanum* species; he also investigated leptins, which confer resistance to Colorado potato beetle. Subsequently, his research was redirected to develop methods for controlling mushroom diseases, and Ken became an authority on mushroom viruses. In 1988, Ken returned to research on potato late blight. Among his many significant con-

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tributions were the first identification in 1991 of the A2 mating type of *P. infestans* in the United States; the detection of metalaxyl resistance in *P. infestans* in the United States for the first time in 1993; characterization and tracking of new genotypes of *P. infestans*; and studies on the role of seed tuber infection in late blight epidemiology. Ken led international research on potato late blight, collaborating with scientists in Mexico, Costa Rica, Russia, the United Kingdom, Ireland, Uruguay, and Taiwan, and served as the research leader of the Vegetable Crops Laboratory for 3 years.

Ken was very active in the APS Potomac Division, serving on many committees and being elected as vice president in 1992 and president in 1993. While president, he presided at the Potomac Division's very successful Golden Jubilee meeting. Ken served as the Potomac Division's representative to the Washington Academy of Science for 6 years and was elected a national Fellow of the Academy. He received the Potomac Division's Distinguished Service Award in 1999 and the Alumnus of Achievement award from Fairmont State College in 2011.

Ken's wife **Rebecca** predeceased him in November 2020. He is held in loving memory by his brother **Paul**, sons **Dennis** and **Erik**, and his daughter **Charisse** and by his grandchildren, great-granddaughter, and all his extended family. He is remembered with great affection by his many scientific colleagues across the world.

A titan of the wheat world succumbed to COVID-19 on February 17, 2021. **Sanjaya Rajaram**, aged 78, passed away in Cuidad Obregon, Sonora, Mexico. "Raj," as he was called by those who knew him, carried the mantle of his grand mentors, **Norman Borlaug** and **Glenn Anderson**, the driving forces of the wheat revolution of the 20th century. He took over CIMMYT's bread wheat program in the early 1970s and proceeded to lead a second Green Revolution in wheat production into the early 2000s that continues through today.

Rajaram was born and raised in Raipur, a small Indian farming village near the city of Varanasi, Uttar Pradesh. The family was of modest means, and Raj was one of the few in the village who went to school. He was a good student and ultimately received a scholarship to study agriculture at the college in Gorakhpur, close to his home. Once finished, he went on to IARI, New Delhi, for his M.S. degree under the guidance of **M. S. Swaminathan** and **N. L. Dhawan** and was then awarded a Ph.D. scholarship to the University of Sydney, where he studied plant pathology and breeding under **I. A. Watson** and **N. Derera**. Upon his return to India, Anderson offered him a postdoctoral fellowship in India, and after 6 months, he asked Raj to go to CIMMYT in Mexico.

In Mexico, Rajaram impressed Borlaug and Anderson and went from postdoctoral fellow in 1969–1971 to geneticist in 1971–1972 and became head of CIMMYT's Bread Wheat Breeding Program in 1972. In 1996 he was appointed as director, International Wheat Program. Borlaug and Anderson saw Raj's ability to "feel" the plants; he also had deep empathy for, and worked well with, the young national scientists training in the program. Both Borlaug and Anderson knew how critical it was to have open-minded, young scientists to change the old system and accept new technology. Raj also had a photographic memory for wheat varieties and people. Furthermore, his grasp of handling large numbers of crosses and management of the populations and nurseries was unparalleled.

During Raj's leadership of the CIMMYT Wheat Program, 481 cultivars were released in 51 countries. These cultivars, grown on around 60 million ha, had increased yield stability and potential, broad agronomic adaptation, more efficient input utilization, and improved disease resistance. This increased global wheat production by more than 200 million tons during his lifetime across most wheat regions in the world.

Other significant achievements included increased rust resistance based on slow rusting genes and reduced use of race-specific resistance followed by significant advances in identification of these genes; increased genetic variability via spring × winter crosses and use of synthetic wheat; development of wheat lines tolerant to acidic soils; increased exchange of information via the international nursery system, which ultimately led to the International Wheat Information System; increased reliability of data and analysis over time and space; an expanded global testing system to identify lines with the highest yield potential, disease resistance, and abiotic stress tolerance; and structuring of the program according to mega-environments. None of this happened in a vacuum and required outstanding leadership and teamwork from scientists, students, and national staff working in Mexico and cooperating countries.

Human resource development was a critical component in the success of the worldwide wheat effort. Raj interacted with and mentored more than 700 young scientists from around the world. These interactions opened minds and doors that never could have been opened otherwise. He also supported many advanced projects in the wheat program with universities worldwide. In his efforts with colleagues and students, he published more than 419 publications, 119 of which were in refereed journals.

In honor of his lifetime dedication and success in increasing food production and helping to reduce world hunger, Rajaram was awarded the World Food Prize in 2014. Over his career he received numerous honorary degrees and awards, including the Pravasi Bharatiya Samman Award, the highest honor conferred on Indians overseas, and the Padmi Shri Award, India; Fellow, IAAS; Presidential Award, Fellow, and International Service in Agronomy by ASA and CSSA; the Rank Award, United Kingdom; the Friendship Award, China; the Crawford Fund Derek Tribe Award, Australia; the Khwarizmi International Award, Iran; Order of Quetzal Award, Guatemala.

After his retirement from CIMMYT, Rajaram served as director of the Integrated Gene Management Program at the International Center for Agricultural Research in the Dry Areas (ICARDA) before formally retiring in 2008. In his retirement, he continued as a special scientific advisor to CIMMYT and ICARDA.

In addition to his successful career as a plant scientist, Rajaram launched and operated Resource Seeds International, a company created to develop and market the seed of improved wheat varieties. In recent years, Raj was president of Fundacion Ambiental del Valle del Yaqui, A.C., a nonprofit foundation supporting environmental improvement in Sonora through afforestation and reforestation with native trees.

The world has lost one of the greatest "Hunger Fighters" of our time. Rest in peace friend and mentor. Deep condolences are sent to the Rajaram family. ■

Graduate Student Spotlight: David Strickland

What type of degree program are you enrolled in?

Ph.D., Cornell University.

What year are you in graduate school?

I am currently a fourth-year student, with an expected graduation date of spring 2023.

What is your academic department/section called at your institution?

Section of Plant Pathology and Plant-Microbe Biology.

Who is your major professor?

Dr. Kerik D. Cox.

Are you an APS member?

Yes.

How have you been involved in the APS organization?

I attended the Northeast–Potomac Joint Division Meeting this March, and I look forward to getting more involved with APS through committees and the national annual meetings.

Please provide a brief description of your research.

My research is focused on evaluating applied chemical management solutions for apple powdery mildew (*Podosphaera leucotricha*). My molecular work focuses on evaluation of *P. leucotricha* populations for resistance to commonly used single-site fungicides. I also have a sideline in fruit finish disorders (apple scarf skin) and postharvest studies (bitter rot, black rot); projects that were prompted by problems New York State growers are experiencing in their orchards.

What's something interesting most people don't know about you?

I write sci-fi short fiction in my free time. To date, I have one work published!

What are some of your interests outside of science?

Cooking, board and card games, and personal finance.

What is your hometown?

Penn Yan, NY, USA.

What is your favorite pathogen/plant disease?

I've really enjoyed studying *P. leucotricha* (apple powdery mildew).

If you know you are pursuing a specific career sector, what is it?

I am interested in exploring careers in agribusiness industries.

How did you become interested in the field of plant pathology?

My prior experiences providing technical support in **Drs. Gennaro Fazio**, **Steve Reiners**, and **Sarah Pethybridge's** research programs at Cornell AgriTech provided me a lot of exposure to the field over the past 10 years. That, as well as my youth spent in the family orchard and being a part of 4-H, really solidified my interest in agriculture. The applied aspects of the plant pathology discipline interest me most because I enjoy helping people solve problems that have an immediate need, such as the preservation of our society's food supply.

Do you have any social media handles that you want to share?

E-mail: das574@cornell.edu
Twitter: @dstrickland64 ■

Learn more about the APS Graduate Student Committee initiatives and student opportunities. Connect with the committee on Twitter @plantpathgrads and Facebook.

Classifieds

Post-Doctoral Research Associate (Fungicide Resistance and Fungal Population Genomics)

University of Georgia (Tifton, Georgia)

A postdoctoral researcher position is available in **Dr. Bhabesh Dutta's** Vegetable Extension Pathology Program at the University of Georgia, Tifton, GA. The Post-doctoral Research Associate will conduct research on detecting and understanding mechanisms of fungicide resistance in *Alternaria* sp. in brassica and *Colletotrichum* sp. and *Fusarium* sp. in cucurbits. The candidate is expected to utilize techniques not limited to classical mycology, including fungicide sensitivity assays, genomics, and bioinformatics. The candidate is also expected to utilize field- and greenhouse-based assays to test hypotheses. In addition to conducting research, the incumbent is expected to work closely with an interdisciplinary team across multiple states to evaluate the cultural practices that reduce *Alternaria* losses in broccoli. The incumbent is expected to take a leadership role in data collection, data analysis, and compiling manuscripts for publication in appropriate journals. The successful candidate may be expected to work closely with different key industry stakeholders and could be involved in supervising undergraduates. The incumbent will also be expected to present results at local and national conferences. The candidate is also expected to assist PI in writing and preparing federal proposals for submission.

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Ph.D. degree in plant pathology or plant sciences or a related area is required. The candidate should have a working understanding of and experience in projects related to fungicide resistance and published articles on related subject matter. Experience with fungicide sensitivity assay, genomics, and bioinformatics is preferred.

Interested candidates should apply here.

Scientist (Postharvest/Plant Physiology)

Mori (Boston, Massachusetts)

Company Background

Mori (formerly known as Cambridge Crops) is a fast-moving, venture-backed, B2B start-up focused on innovations in the food, agriculture, and packaging industries. We leverage the unique properties of a naturally derived protein found in silk to extend the shelf life of perishable foods, including whole and cut produce, meat, and seafood.

Our mission is simple, "*More Food, Less Waste*." Our company goals are to reduce food waste, improve supply chain efficiencies, and increase food access.

Job Description

In this role, you will join the Product team and collaborate with Mori's scientists, engineers, and research associates to design experiments and conduct research on silk mechanisms of action related to plant physiology of fruits and vegetables. As part of our dynamic team, who are driven to bring exciting new products to market that prevent food waste, you will be tasked with leveraging information to support development of products that extend shelf life throughout the food chain. Your responsibilities will include:

- Conducting applied research on a wide range of postharvest produce items, including leafy greens.
- Designing studies that further understanding of silk coverage and adhesion on produce.
- Developing mechanistic studies to define product limits of performance based on plant physiology metrics and various postharvest handling and storage scenarios.
- Identifying and defining new opportunities for our products on produce that are valuable to customers.
- Developing appropriate model systems for new product testing to enable efficient discovery and early-phase product testing.
- Acting as a thought partner to leadership and team members on technical feasibility of product pipeline.
- Mentoring junior team members and helping the team develop new skills.
- Working flexible hours when needed, including the occasional evening and weekend.

This is a brand-new role on our team and comes with the opportunity and flexibility to shape it to make it your own.

Qualifications

Ideal candidates will have the following qualifications:

- Ph.D. in plant science/horticulture or related discipline with 2+ years post-Ph.D. research and/or industry experience preferred, or a master's degree in these fields with 5+ years experience.
- Demonstrated postharvest and plant physiology experience with annual and biennial crops and experience working with leafy greens preferred.
- Research focus in postharvest disease or spoilage and strong interest in food waste reduction.
- Collaborative team player.
- Excellent written and oral communication skills for a wide range of technical backgrounds.
- Question-driven, curious, experienced scientist with demonstrated ability to work independently.
- Experienced in data analysis and data-driven decision making.
- Passion for Mori's mission and values and enthusiasm for working in a multi-faceted, start-up environment.

Start date June 1, 2021 or sooner

Team culture

Our tight-knit team has spent their careers developing and commercializing technology. Our company values are:

- Think big, start small
- Embrace complexity
- See it through
- Operate with care
- Keep perspective

Benefits

- Employees enjoy a generous and flexible paid time-off policy.
- Unlimited paid sick time.
- Physical and mental health benefits.
- For new parents, paid maternity and paternity leave.
- Other fun perks like endless coffee/tea and snacks!

Mori is an Equal Opportunity Employer and complies with the Americans with Disabilities Act of 1990 (ADA), as amended by the ADA Amendments Act of 2008, and all applicable state and local fair employment practices laws. Employment opportunities at Mori are based upon one's qualifications and capabilities to perform the essential functions of a particular job. All employment opportunities are provided without regard to race, religion, sex, pregnancy, childbirth or related medical conditions, national origin, age, veteran status, disability, genetic information, or any other characteristic protected by law.

If interested in applying to the Mori team, please email your resume and a brief cover letter explaining your relevant experience and interest to Recruiting@mori.com by April 15, 2021. ■

FIND THE LATEST JOBS IN PLANT PATHOLOGY

Search online for new job opportunities in the field of plant pathology using the APS Job Center. Visit the APS Job Center.

Calendar

APS-SPONSORED EVENTS

APRIL 2021

OPRO Sponsored Lunch and Learn with Scientific Communication Experts—Carlyn Buckler and Matthew Kasson

JUNE 2021

APS Pacific Division Meeting

APS North Central Division Meeting

AUGUST 2021

Plant Health 2021 Online

SEPTEMBER 2021

APS Caribbean Division Meeting

Research Notebook

SPOTLIGHT

Pathogen Spotlight: *Botrytis* Gray Mold

Botrytis is a necrotrophic fungal pathogen that infects thousands of plant species and causes significant economic loss. Unsurprisingly, *B. cinerea*, the causal agent of gray mold, was ranked as the second most important fungal pathogen by the plant pathology community. These spotlight articles in the March issue of *Phytopathology* present many breakthroughs in paramount and urgent issues with diseases caused by *Botrytis*.

Be Included in the Next *MPMI* Focus Issue!

In response to the Top 10 Unanswered Questions in MPMI, the 2022 *MPMI* Focus Issue will address the role of the abiotic environment on interactions between plants and microbes. Focus Issue Editors **Jacquie Bede**, **Kenichi Tsuda**, and **Jeanne Harris** will be accepting submissions through July 24, 2021.

Call for Papers on *Candidatus* Liberibacter Pathosystems

Phytopathology Focus Issue Editors **Elizabeth (Betsy) Pierson**, **Jaime Cubero**, **Judith K. Brown**, **Caroline Roper**, and **Nian Wang** have selected *Candidatus* Liberibacter pathosystems as the topic for the January 2022 Focus Issue. Submit your research by June 15, 2021.

Floral Probiotics Reduce Apple Disease

In a paper recently published in *Phytobiomes Journal*, researchers found that treating apple flowers with a probiotic spray reduced the incidence of fire blight. Flowers may be a particularly promising system in which growers can actively influence microbiomes—compared to roots and leaves, flowers are short-lived, which could make reshaping their microbiomes both more technically feasible and biologically impactful. ■

TRENDING

Phytopathology

Rpg7: A New Gene for Stem Rust Resistance from *Hordeum vulgare* ssp. *spontaneum*
E. Henningsen, A. H. Sallam, O. Matny, T. Szinyei, M. Figueroa, and B. J. Steffenson

Peeling the Onion: Towards a Better Understanding of *Botrytis* Diseases of Onion
M. B. F. Steentjes, O. E. Scholten, and J. A. L. van Kan

Advances in Understanding Fungicide Resistance in *Botrytis cinerea* in China
W. Shao, Y. Zhao, and Z. Ma

Plant Disease

Evolution of Disease Severity and Susceptibility in the Asteraceae to the Powdery Mildew *Golovinomyces latisporus*: Major Phylogenetic Structure Coupled With Highly Variable Disease Severity at Fine Scales
M. Bradshaw, E. Goolsby, C. Mason, and P. C. Tobin

Graft-Transmissible Diseases of *Ribes*—Pathogens, Impact, and Control
J. Špak, I. Koloniuk, and I. E. Tzanetakis

Dollar Spot Suppression on Creeping Bentgrass in Response to Repeated Foliar Nitrogen Applications
R. Townsend, M. D. Millican, D. Smith, E. Nangle, K. Hockemeyer, D. Soldat, and P. L. Koch

MPMI

A Novel Role of Salt- and Drought-Induced RING 1 Protein in Modulating Plant Defense Against Hemibiotrophic and Necrotrophic Pathogens
V. S. Ramu, S. Oh, H.-K. Lee, R. S. Nandety, Y. Oh, S. Lee, et al.

Chitin in Strawberry Cultivation: Foliar Growth and Defense Response Promotion, but Reduced Fruit Yield and Disease Resistance by Nutrient Imbalances
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