

2017

APS Annual Meeting

AUGUST 5–9 • SAN ANTONIO, TEXAS



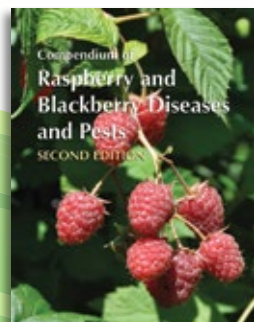
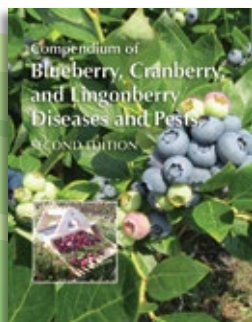
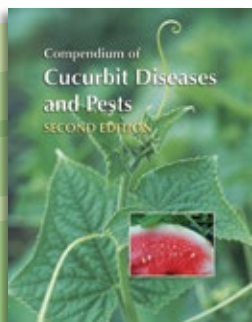
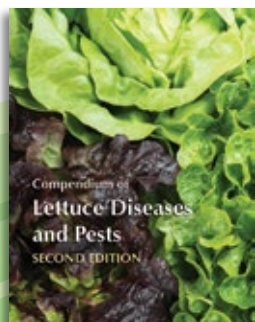
PROGRAM BOOK

Changing Landscapes of Plant Pathology

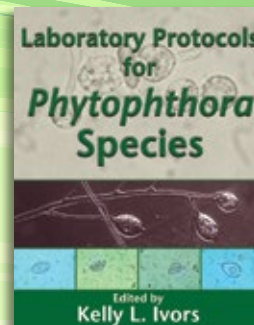
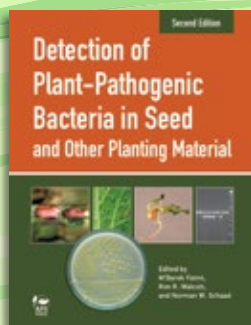
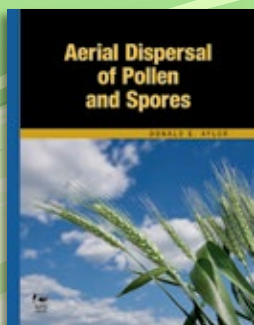
The American Phytopathological Society

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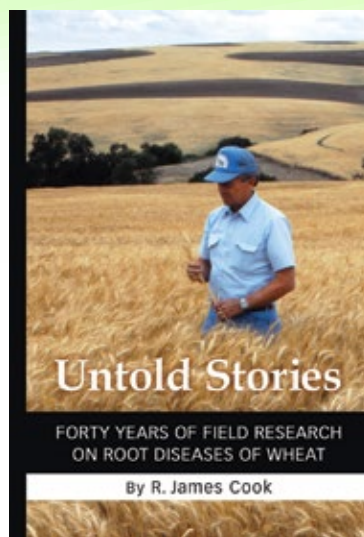
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SPECIAL EVENT!
Book Signing

Sunday, August 6; 4:30 – 6:00 p.m.
AND
Monday, August 7; 2:30 – 4:00 p.m.
APS PRESS Bookstore, Exhibit Hall



Dr. R. James Cook –
*Untold Stories: Forty
Years of Field Research
on Root Diseases of
Wheat*



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WELCOME

to the 2017 APS Annual Meeting



On behalf of The American Phytopathological Society, welcome to San Antonio for the 2017 Annual Meeting! This year's theme "Changing Landscapes of Plant Pathology" highlights two factors that will have a profound impact on the science and practice of plant pathology: new technologies and the next generation of plant pathologists who will employ them in their pursuit of solutions to plant health problems. During the next few days, we will explore the latest and greatest discoveries in plant pathology and related disciplines. New this year is a change for the Awards Ceremony, with Fellows presented on Sunday and Excellence and Named Awards on Monday. Sunday takes on the addition of keynote speaker Jack Bobo discussing agriculture and the future of our planet. The Plenary Session on Monday will feature our Excellence and Named Award winners, as well as three scientists discussing some exciting new technologies and their applications to plant pathology. The General Session on Wednesday morning will leave you with some thought-provoking highlights from the previous few days. This year's scientific program will include our familiar special, technical, and poster sessions, as well as workshops and field trips. Several new activities have been planned for this year's meeting, including some family-friendly additions to the meeting, making it easier for our members with families to connect. Please take advantage of the many social gatherings and networking opportunities available to renew old friendships, make new ones, and engage with colleagues from all over the world.

We're happy to see you at the 2017 APS Annual Meeting!

Timothy D. Murray, APS President



A warm welcome to San Antonio and the 2017 APS Annual Meeting. I'm very excited about the program that we—and that is we "writ large!"—have put together for you this year. Back by popular demand, you will again have the opportunity to hear from four Phytopathologists of Distinction (PoDs) and learn about their life stories as plant pathologists. We have more than 50 concurrent and technical sessions and 700 posters that will highlight the latest research advances and solutions. A number of the sessions will be a prelude to the 2018 International Congress of Plant Pathology, where similar topics will be addressed in an international context.

This year you have a number of Hot Topic sessions in which to participate, including "Navigating Contentious Conversations," "Science as Story and Story as Science: Telling Plant Pathology Research Stories," "Next Generation of Plant Pathologists Exploiting Sequencing Strategies to Further our Understanding of Plant Virus-insect Vector Interactions," a participatory panel discussion on "Seed-borne versus Seed-transmitted Diseases: What Is the Difference?" and "Highs and Lows of Cannabis Pathology." There is something for everyone and, as is often the case, it will be difficult to choose among the many possible sessions!

And of course, there will be ample opportunities to network at the various socials, between sessions, and in interactive sessions such as the Idea Cafés. Idea Cafés will be held at two times during this meeting: on Monday afternoon during poster viewing and on Wednesday morning, when you can enjoy coffee and pastries while you engage in Idea Cafés or with poster authors.

Welcome—and enjoy!

Mary E. Palm, APS Program Chair and President-Elect

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Connect at the Meeting and All Year Long— Get Social!



Follow and join our social media groups so you can connect now and after the meeting.

- **On Twitter? Use #APS2017 and #PlantPathology** throughout the meeting and follow @plantdisease.
- Like The American Phytopathological Society on **Facebook**.
- Join The American Phytopathological Society group on **LinkedIn**.

CALLING ALL SNAPSHOT USERS! Share your #APS2017 experience with our unique geofilter!

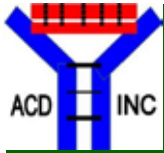


The American Phytopathological Society (APS)

APS is a vibrant community of exciting and committed plant health scientists and practitioners from around the world. APS members from more than 100 practice areas have access to significant cutting-edge research to drive the science of plant pathology and their professional development. Members also contribute their expertise to a variety of volunteer positions and gain valuable experience to propel their careers.

U.S. Food Waste Challenge

On June 4, 2013, the U.S. Department of Agriculture (USDA), in collaboration with the U.S. Environmental Protection Agency (EPA) launched the U.S. Food Waste Challenge, calling on others across the food chain—including producer groups, processors, manufacturers, retailers, communities, and other government agencies—to join the effort to reduce, recover, and recycle food waste. APS supports this effort by working with the hotels and convention centers to donate food from APS meetings to food shelves in the local area.



AC Diagnostics, Inc.

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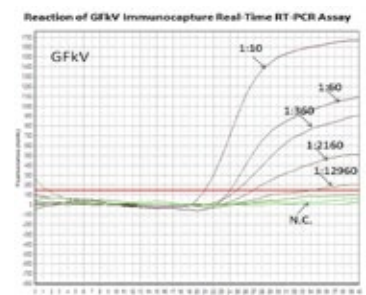
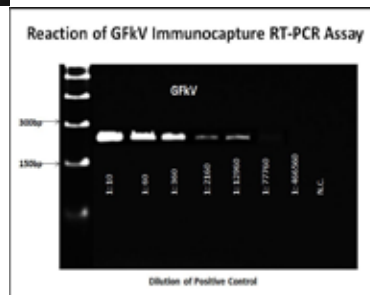
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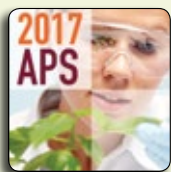
VISIT BOOTH #20

1131 W. Cato Springs Road, Fayetteville, AR 72701

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App In! The Meeting at Your Fingertips!



Why use the app? More content than the Program Book + features connecting you with other attendees and the latest updates.....and it is **FREE!**

Here are the best features:

- **Browse** the program schedule, exhibitor list, posters, and general information
- **Customize** your schedule and add appointments
- **Access** session information, including full abstracts
- **Add** exhibitors to your to-do list
- **Connect** with other attendees: send messages and make appointments
- **Connect** with your iPad-specific version
- **Schedule Posters by Appointment** by connecting with poster authors to make appointments to meet and discuss poster content (in addition to the poster author time)

Get the app...it's **FREE!**

Available for iOS (iPhone and iPad) and Android devices; Blackberry and Windows phone users have access to a mobile website that will offer the same functionality. Go to mobileapp.apsnet.org to find links to your mobile app store or search APS Meeting in your app store.

Registration Hours

Hall 1 Registration, Convention Center

Saturday, August 5	12:00 – 6:00 p.m.
Sunday, August 6	7:00 a.m. – 6:00 p.m.
Monday, August 7	7:30 a.m. – 6:00 p.m.
Tuesday, August 8	7:30 a.m. – 5:30 p.m.
Wednesday, August 9	7:30 a.m. – 2:00 p.m.

Exhibit and Poster Hours

Exhibit Hall 1, Convention Center

Sunday, August 6

8:00 a.m. – 2:00 p.m.....	Exhibit Set-Up
12:00 – 2:00 p.m.	Poster Set-Up
4:00 – 6:00 p.m.	Social Gathering with Exhibition and Posters
4:00 – 6:00 p.m.	Poster Viewing

Monday, August 7

8:00 a.m. – 6:00 p.m.	Poster Viewing
11:30 a.m. – 6:00 p.m.....	Exhibits Open
11:30 a.m. – 6:00 p.m.....	OIP Silent Auction
2:30 – 3:00 p.m.	Poster Huddles – see page 47 for a list of topics
3:00 – 5:00 p.m.	Poster Viewing with Authors Present
	3:00 – 4:00 p.m. Posters 1 – 320 (even-numbered posters)
	4:00 – 5:00 p.m. Posters 321 – 465 (even-numbered posters)
	If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.

Tuesday, August 8

8:00 a.m. – 6:00 p.m.....	Poster Viewing
10:00 a.m. – 6:00 p.m.....	Exhibits Open
2:30 – 3:00 p.m.	Poster Huddles – see page 47 for a list of topics
2:30 – 5:00 p.m.	Career Fair
3:00 – 5:00 p.m.	Poster Viewing with Authors Present
	3:00 – 4:00 p.m. Posters 1 – 320 (odd-numbered posters)
	4:00 – 5:00 p.m. Posters 321 – 465 (odd-numbered posters)
	If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.

Wednesday, August 9

8:00 – 10:30 a.m.	Exhibits Open
9:00 – 10:30 a.m.	Poster Viewing
9:00 – 10:30 a.m.	PhytoCafe (with coffee and light breakfast items)
	9:00 – 9:30 a.m. Poster Huddles
	9:30 – 10:30 a.m. Idea Cafes
	9:30 – 10:30 a.m. One-to-One (1:1) Conversation with an Expert
10:30 – 11:00 a.m.	Poster Take-Down
10:45 a.m. – 12:30 p.m.	Exhibit Take-Down

Looking for Breakfast, Lunch, Beverage, or a Snack?

If you are looking for a quick snack or a nice dining experience you do not have to go far. We welcome you to sit and relax in between events or sessions at one of the three onsite dining locations throughout the Henry B. González Convention Center. The Market Café is conveniently located in the Main Lobby near the Registration desk. Stop here to get coffee, snacks and meals on your way into the Exhibit Hall.



Open Meeting Room

A small meeting room for up to 20 people is available for use during the meeting at the Henry B. González Convention Center. To check availability and reserve a room, stop by the Registration Desk.

Speaker Ready Room

Room 223, Convention Center

APS will again be recording scientific session presentations with author approval. The Speaker Ready Room is available for presenters to do the final loading of presentations and make any last-minute changes to presentations.

Saturday, August 5	4:00 – 8:00 p.m.
Sunday, August 6	9:00 a.m. – 5:00 p.m.
Monday, August 7	7:00 a.m. – 4:00 p.m.
Tuesday, August 8	7:00 a.m. – 4:00 p.m.
Wednesday, August 9	7:00 a.m. – 12:00 p.m.

New! Networking Event: Pitch120 Training and Practice

Sponsored by the Office of Public Relations & Outreach (OPRO), the Pitch120 Training & Practice Session is a free workshop, available to all meeting attendees. Held Sunday, August 6, from 7:00 to 9:00 p.m. in Room Travis AB, Hyatt, OPRO board members will provide training to attendees on how to “pitch” your research in under two minutes using straight-forward, clear, and interesting approaches. Then, armed with these new skills, attendees will show off their own Pitch120. The goal is to equip attendees with the skills they need to quickly and effectively communicate their science to a wide audience.

Give and Help Grow with the APS Foundation

Visit the APS Foundation booth—located near the Registration— desk to discover how your donations create opportunities for new leaders in plant pathology. Learn about the 2017 Foundation awardees and new funding initiatives. Students donating at least \$20 will be entered into a drawing to win a \$500 travel grant to next year’s annual meeting! The foundation will also collect donations for the ICPP2018 Bursary Fund to be used for travel support for early- and mid-career plant pathologists and related plant health scientists working in developing countries who otherwise would not be able to participate in the congress. Donate today and make a difference tomorrow.



OIP Silent Auction

The Office of International Programs (OIP) invites you to this year’s silent auction! Proceeds will support scientists traveling to ICPP2018 from developing economies. Bid on an item to support this exciting event! The auction will take place Monday, August 7, from 11:30 a.m. to 6 p.m. in the Exhibit Hall.



Photo Release

Photographs will be taken during the meeting. By registering for this meeting, you agree to allow APS to use your photo in any of their publications or on their website and membership materials.

Dress

The official dress for the meeting is business casual.

Meeting Facilities

Henry B. González Convention Center

900 E. Market Street
San Antonio, Texas 78205
+1.210.207.8500

Grand Hyatt San Antonio

600 East Market Street
San Antonio, Texas 78205
+1.210.224.1234

La Quinta Inn & Suite (San Antonio Riverwalk)

San Antonio Riverwalk
303 Blum St.
San Antonio, TX 78205-3303
+1.210.222.9181

Menger Hotel

204 Alamo Plaza
San Antonio, TX 78205
+1.210.223.4361

Offsite Venues

Industry & Extension Networking Event

Monday, August 7, 6:30 – 9:00 p.m.
Sunset Station (*located a short walk from the convention center, maps available at the registration desk*)
The Depot Room
1174 East Commerce Street

LGBTQ Social and Networking Hour

Tuesday, August 8, 6:30 – 7:30 p.m.
Veranda Room, Casa Rio Restaurant (*located on the Riverwalk, a short walk from the convention center*)
430 E. Commerce Street • Phone: 210.225.6718

Committee for Diversity and Equality presents “STRIDE for the Future” Workshop

Tuesday, August 8, 7:30 – 9:30 p.m.
Veranda Room, Casa Rio Restaurant (*located on the Riverwalk, a short walk from the convention center*)
430 E. Commerce Street • Phone: 210.225.6718

Thank You, APS Members!

APS members represent a multitude of specialties and play an important role in shaping the future of our profession.

We are excited to have you continue to grow with us; thank you for helping APS reach its goals.



Helping Future Plant Pathologists Succeed

With your donations at this year's annual meeting we can support plant pathology's up-and-coming talent.

The Foundation will also collect donations for the ICPP2018 Bursary Fund to be used for travel support for early- and mid-career plant pathologists and related plant health scientists working in developing countries who otherwise would not be able to participate in the Congress.

Students—Donate \$20 or more and enter a drawing for a \$500 student travel award for the **2018**

International Congress of Plant Pathology!



Safety Tips

Do not travel alone—stay in groups and travel in well-lit areas.

Remove name badges when outside the hotel or convention center unless you are participating in a meeting event.

- Do not give your room number out to anyone you do not know and avoid giving out your room number in conversations where strangers may hear you talking.
- Bolt your hotel room door and only open it when you know who is on the other side. (Note: Hotel personnel wear uniforms and have identification badges. If in doubt, call hotel security to verify an employee's identity.)
- Do not leave your door ajar if you are going down the hall for ice. Someone may enter when you are not looking.
- Know where the stairs are located in case of a fire (do not use elevators). Also count the number of doors to the nearest exit in case you cannot see in a smoke-filled hallway.
- Valuables, airline tickets, and money should be kept in a hotel safety deposit box or in a room safe, if available.

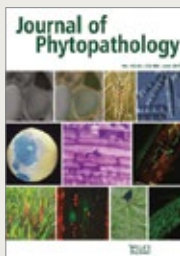
Procedures in Case of a Fire

- Try to leave the hotel as quickly as possible. If you cannot, stay in your room and call the operator or security to let them know you are in your room.
- Put your hand on the room door to see if it is hot before opening it. If it is, do not open it quickly. Open it just a crack to see what is on the other side and be prepared to slam it shut quickly if necessary.
- If you leave the room, take your room key with you! Shut your room door to keep smoke out. You may have to return if the exit is blocked. Remember the way back to your room as you go to the exit in case you need to return.
- If necessary, drop to your knees to avoid smoke. Tie a wet towel around your nose and mouth to act as a smoke filter. Fold it into a triangle and put the corner in your mouth.
- Do not take the elevator when you smell smoke or if you know that there is a fire in the building.

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Molecular Plant Pathology
Impact Factor: 4.697
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Plant Pathology
Impact Factor: 2.425
Published in association with the British Society for Plant Pathology



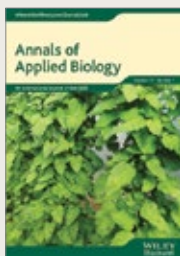
Phytotherapy Research
Impact Factor: 3.092



Pest Management Science
Impact Factor: 3.253
Published by the Society of Chemical Industry



Forest Pathology
Impact Factor: 1.547



Annals of Applied Biology
Impact Factor: 2.046
Published on behalf of the Association of Applied Biologists



Plant Breeding
Impact Factor: 1.335



Journal of Plant Nutrition and Soil Science
Impact Factor: 2.102
Published in association with the German Soil Science Society and the German Society for Plant Nutrition



The Plant Journal
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Published in association with the Society for Experimental Biology



Plant Biotechnology Journal
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Plant Direct
Published in association with the Society for Experimental Biology and the American Association of Plant Biologists

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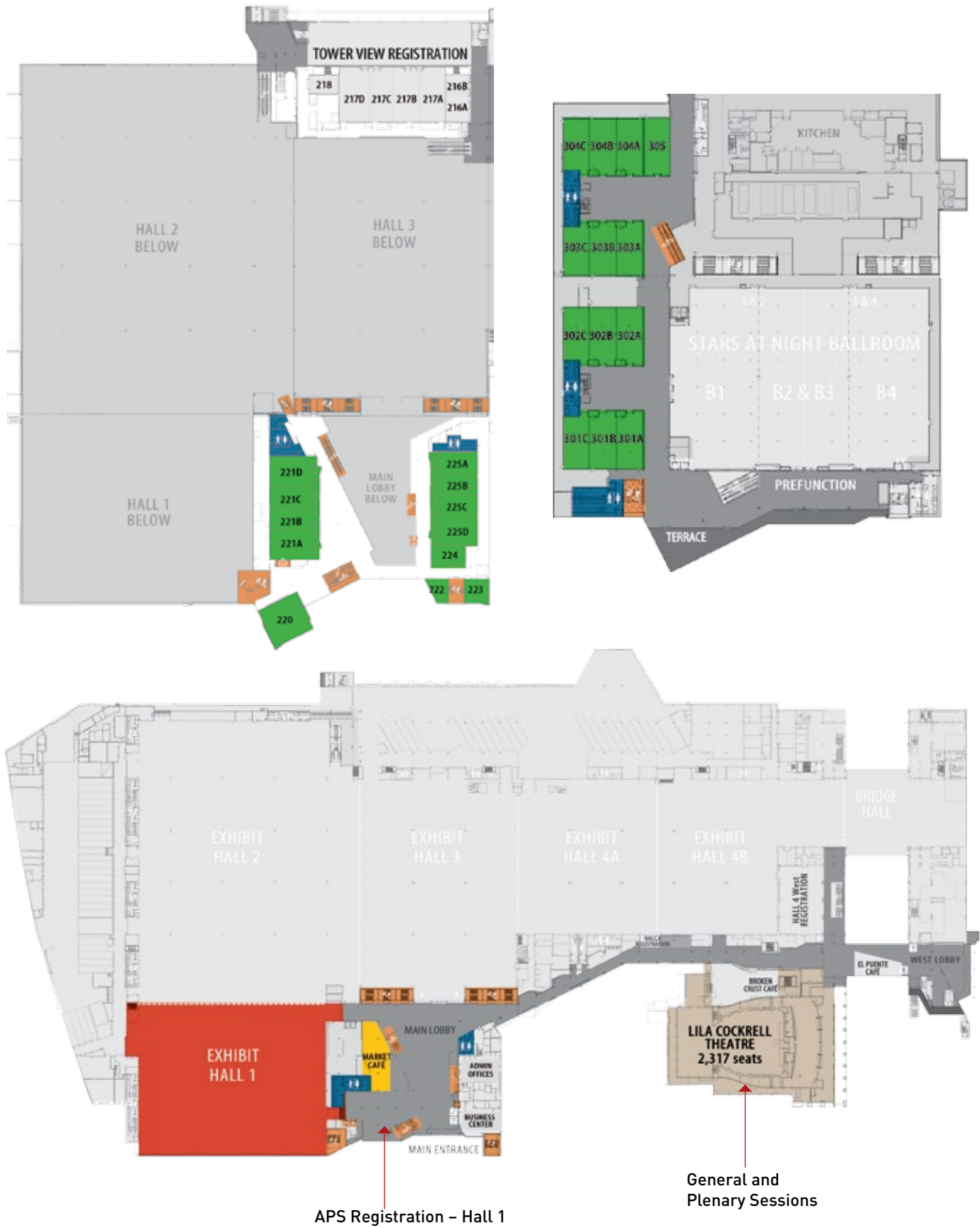


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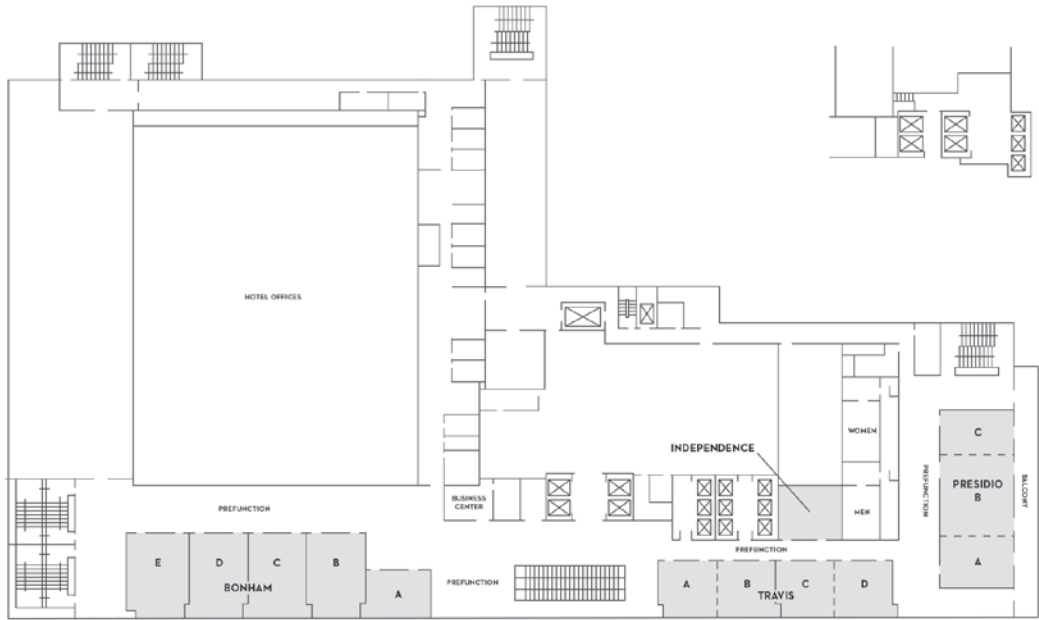
Henry B. Gonzalez Convention Center



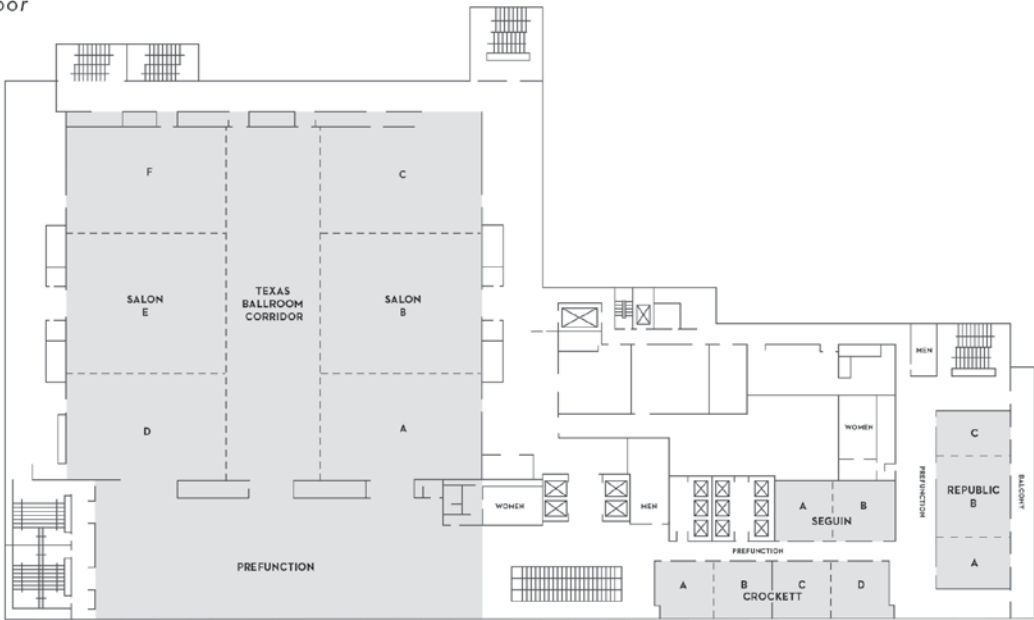


Grand Hyatt San Antonio

FLOOR PLAN Third Floor



Fourth Floor



Live Streaming Sessions—APS Reaches Out with Global Connections

Check out the live streaming sessions during the APS annual meeting on the APS website. Share the session times with your colleagues who are not attending the meeting and encourage them to join in. Times listed are Central Daylight Time.

- **Opening General Session and Awarding of Fellows, followed by Keynote Speaker Jack Bobo;** Sunday, August 6, 10:30 a.m. – 12:00 p.m.
- **Special Session:** Show Me the Money! Assessing the Value of Disease Control in a Changing Landscape; Sunday, August 6, 1:00 – 4:00 p.m.
- **Special Session:** Best Practices in Diagnostic Test Development and Deployment; Monday, August 7, 8:00 – 9:15 a.m.
- **Plenary Session:** Changing Landscapes of Plant Pathology and Awards; Monday, August 7, 9:30 – 11:30 a.m.
- **Special Session:** A Bridge Over Troubled Ecosystems: How Host Cultivation Creates Novel Pathogens; Monday, August 7, 1:00 – 2:15 p.m.
- **Special Session:** The Rise and Management Challenges of Multi-Fungicide-Resistant Pathogens; Tuesday, August 8, 8:30 – 11:30 a.m.
- **Special Session:** The Socioeconomic Impact of New and Re-emerging Bacterial Diseases: A National Perspective; Tuesday, August 8, 1:00 – 2:15 p.m.
- **General Session with Speaker Jeff Hurt:** “Making the Science of Plant Pathology Work for You: What Now? What Next?”; Wednesday, August 9, 10:45 a.m. – 12:00 p.m.
- **Special Session:** Adapt, Change, and Improve: How to Control Diseases as the Climate Is Changing; Wednesday, August 9, 1:00 – 4:00 p.m.



UNIQUE APPROACHES TO THE EXCHANGE OF SCIENCE

PhytoView Session

Seedborne vs. Seed-Transmitted Plant Pathogens: The Curious Case of *Phomopsis* spp. on Spinach Seed

Sunday, August 6, 2:45 – 4:00 p.m.; Room 221B, Convention Center

Engage in facilitated conversations that explore questions/issues relevant to plant pathology as we explore all points of view. For more information, see page 21 of the Program Book.

Hot Topics

Sunday through Tuesday

Catch the latest topics that are trending in plant pathology with information from experts in the know. Hot Topics take place during the scientific sessions; check the daily program schedule for Hot Topic sessions held throughout the meeting.

Idea Cafés

New days and times! Tuesday, August 8, 5:00 – 6:00 p.m., and Wednesday, August 9, 9:30 – 10:30 a.m.; Exhibit Hall, Convention Center

Seeking solutions to an existing problem, a conversation on a specific issue or concern, or innovative ideas in your area of research or outreach? Check out our list of topics! Idea Cafés gather great minds in plant pathology in an informal setting (one round table of 10 assigned to each topic) to converse on an area of interest to you! For a complete listing of table topics, see page 23 of the Program Book.

Back by Popular Demand!

PODs—Conversations with Phytopathologists of Distinction

Sunday, August 6, 2:45 – 4:00 p.m.; Room 224, Convention Center

Monday, August 7, 1:00 – 2:15 p.m.; Room 224, Convention Center

Based on the well-known and popular TED talks (Technology, Entertainment, Design), conversations with Phytopathologists of Distinction (PODs) offer meeting attendees in all stages of their career an opportunity to connect with APS fellows in an informal setting as they discuss their career journey. Join in as they share “their story,” insights, and life experiences in the world of plant pathology. For a complete listing of PODs, see page 19 of the Program Book.

New for 2017!

One-to-One (1:1): Conversation with an Expert

Monday, August 7, 2:30 – 4:00 p.m., and Wednesday, August 9, 9:30 – 10:30 a.m.; Exhibit Hall, Convention Center

This is your opportunity to gain access to a selection of our most knowledgeable experts in plant pathology. These experts have the desire to share their knowledge, skills, and experiences in a variety of scientific and professional areas. These informal 15-minute meetings can be used to get answers to your questions, generate new research ideas, and obtain advice on your professional goals/career. Spaces are limited, sign-up is available during the meeting, watch for signs in the Registration Area and Exhibit Hall.

NEW FORMAT!

OPENING GENERAL SESSION AND AWARDING OF FELLOWS, FOLLOWED BY KEYNOTE SPEAKER JACK BOBO

Sunday, August 6, 10:30 a.m. – 12:00 p.m.; Lila Cockrell Theatre, Convention Center (*live-streamed session*)

New this year! The Opening General Session takes on a new feature with the addition of keynote speaker Jack Bobo. The Awards Ceremony also takes on a new format with the APS Fellow Awards presented during the Opening General Session with the Excellence and Named Awards presented during Monday's Plenary Session.



Can Agriculture Save the Planet Before It Destroys It?

Jack A. Bobo, Senior Vice President,
Chief Communications Officer, Intrexon

In a hot, flat, hyper-connected world, public perception of risk may determine if agriculture saves the planet by 2050

or destroys it. Science and technology may hold the key to addressing the world's biggest problems related to hunger, sustainability, and climate change, but if media experience with pink slime and GMOs are any indication, we may be in for a bumpy ride. This presentation examines global trends in food and agriculture, the interplay between science and public perception of risk, and how organizations, farmers, and scientists build trust to navigate these trends.

NEW FORMAT! MONDAY PLENARY SESSION AND EXCELLENCE AND NAMED AWARDS

Monday's Plenary Session includes the recognition of the Excellence and Named Award recipients, in addition to the plenary presentations.

Changing Landscapes of Plant Pathology

Monday, August 7, 9:30 – 11:30 a.m.; Lila Cockrell Theatre, Convention Center (*live-streamed session*)

Introduction—Tim Murray, APS President



RNA-Based Applications for Agricultural Productivity

Greg Heck, Science Strategy Operations
Manager, Monsanto

RNA-based technologies can be applied to a wide range of agricultural improvement objectives. These applications range from the modification

of harvestable plant components to crop protection scenarios. Extant examples are present in current agricultural production for virus control while additional applications, such as plant-produced dsRNA targeting insect predators, are advancing pending regulatory approvals for commercial release. Numerous considerations need to be taken into account as applications mature. Components of successful utilization include efficacy, robustness, specificity, and safety of dsRNA as an active agent. A historical perspective, advanced examples, and prospects will be presented.

distribution of plant pathogens and increases pathogen genetic diversity. Changes in the genetic make-up of existing pathogen populations can disrupt disease control strategies and research programs as much as the emergence of new pathogens. This presentation will include how population genetics and genomics can help identify pathways of movement, genetic shifts in local pathogen populations, and ultimately changes in disease observed by pathologists in the field.



State-of-the-Art on Sensing Technologies for Plant Disease Detection

Lav Khot, Assistant Professor,
Department of Biological Systems
Engineering, IAREC, Washington State
University

Site-specific disease detection is one of the key aspects of effective crop (loss) management. Recent advances in detectors (optical, chemical) have improved the feasibility of development and use of rapid noncontact/nondestructive sensing techniques in plant disease detection. Advances in versatile ground-aerial platforms and internet of things (IOT)-enabled data acquisition, in-field on-board processing, and near-real-time delivery techniques have also helped in easing logical concerns, about time and labor, of field-level crop scouting. This presentation will focus on state-of-the art in the field of chemical and optical sensors, platforms, and IOT-based technologies that could aid in rapid disease detection. Through case studies in specialty crops, this talk will discuss feasibility of the technology in field-level disease detection as well as challenges that need further research before its commercial use.



Global Movement, Local Consequences: Using Population Genomics to Understand the Changing Landscape of Plant Pathogens

Erica Goss, Assistant Professor, Plant
Pathology and Emerging Pathogens
Institute, University of Florida

Plants and their associated microbes are crossing oceans and international borders at unprecedented rates. Consequently, plant pathologists are dealing with a barrage of introduced plant pathogens. Long-distance movement changes the global

NEW SESSION AND FORMAT! WEDNESDAY GENERAL SESSION WITH SPEAKER JEFF HURT

Wednesday, August 9, 10:45 a.m. – 12:00 p.m.; Lila Cockrell Theatre, Convention Center (*live-streamed session*)

On this last meeting day, don't miss this session where we recognize members who have served on various committees, learn more about the ICPP2018 (International Congress of Plant Pathology), and hear our engaging speaker, Jeff Hurt.



Making the Science of Plant Pathology Work For You: What Now? What's Next?

Jeff Hurt, Executive Vice President, Education & Engagement, Velvet Chainsaw Consulting

You've listened to the observations of the changing landscape's researchers.

You've heard the diverse theories from the APS community of pathologists. You've reviewed and discussed the findings of selected plant pathologists who are employing their results in their pursuit of solutions to plant health problems. Your brain is so full of scientific information that it hurts. What did you really learn from the 2017 APS annual meeting? How will you remember critical research? Even more importantly, how will you remember the critical information so you can apply and share it? Your success following this meeting depends on the science of learning. Let's marry the scientific findings of 2017 plant pathology research with the biological process of learning. Understanding and applying these revolutionary new insights from neuroscience, neuro-education, cognitive psychology, and biology will have tremendous impact on your attitude, behavior, and skill changes.



The Last Alamo Revelry

Wednesday, August 9, 7:00 – 9:30 p.m.;
The Grotto (lower level), Convention Center

Your APS Annual Meeting experience will be as unforgettable as San Antonio's historic Alamo with this special event designed to celebrate what truly brings us together each year: the bonds of education and friendship. Make the Final Night Celebration memorable by getting into the spirit of the Lone Star State by donning your frontier finery, sampling culinary delights, delighting in the live entertainment, and jumping into interactive activities. So, join your colleagues and the APS team for a surprise or two along the way as we network and revel the night away deep in the heart of Texas!

Ticket to the event and a drink ticket are included with full registration. Guest tickets are available for purchase at the Registration Desk.

NEW from APS PRESS!



Compelling and Practical Musings by Celebrated Plant Pathologist R. James Cook



Dr. Cook's highly anticipated new book, *Untold Stories: Forty Years of Field Research on Root Diseases of Wheat*, is a comprehensive account of his four decades of field research—and his personal and professional growth while developing his knowledge, expertise, and unique approach to research on the ecological and biological control of soilborne plant pathogens.

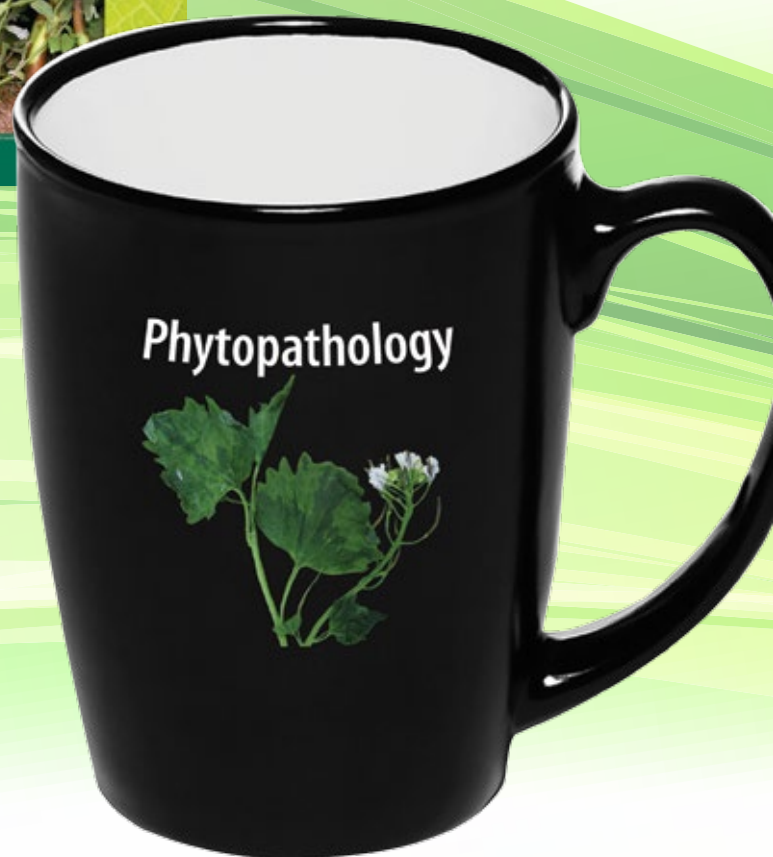
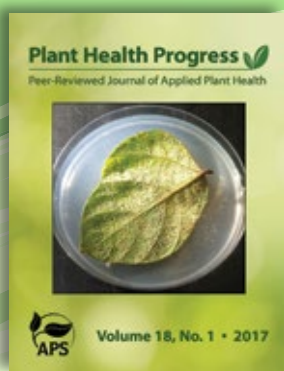
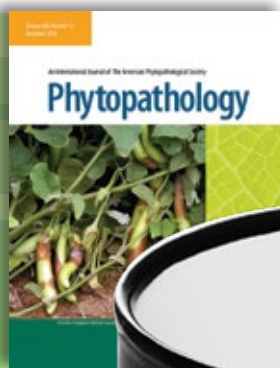
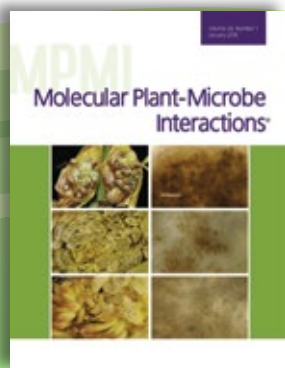
More than simply an autobiographical collection of compelling first-person stories, Dr. Cook imparts unique experiences and knowledge for budding and veteran scientists alike; plus, it serves up "bushels" of knowledge that readers can utilize to make more informed and successful decisions in the field.



SPECIAL PRICING at Dr. Cook's Book Signing!

Sunday, August 6; 4:30 – 6:00 p.m.
AND
Monday, August 7; 2:30 – 4:00 p.m.
APS PRESS Bookstore, Exhibit Hall

FREE APS Journal Mugs at the APS PRESS Bookstore



Get your FREE mug of choice by updating your APS Journals profile and creating a custom alert. Experience our feature-rich publishing platform and get a mug showing off your favorite APS Journal. Also check out our NEW online collection of books and lab protocols!

FREE

Journal Mugs!

Limited quantities available. First come, first served.
One per attendee.

Visit Monday, Tuesday, or Wednesday during bookstore hours!



SUNDAY afternoon

1:00 – 2:15 p.m.

OPENING SESSION FOLLOW-UP with Keynote Speaker Jack Bobo • Room 221 B

TECHNICAL SESSION: Genetics of Resistance and Virulence • Room 221 C

TECHNICAL SESSION: Pathogen Detection and Diagnosis • Room 225 B

1:00 – 4:00 p.m.

SPECIAL SESSION: Beautiful Efficiency: The Multifunctional Nature of Virus Proteins • Room 221 A

SPECIAL SESSION: Schroth – Faces of the Future Session: Host Resistance and Host Pathogens Interactions • Room 225 A

SPECIAL SESSION: Show Me the Money! Assessing the Value of Disease Control in a Changing Landscape • Room 221 D

SPECIAL SESSION: Unfriendly and Beneficial Plant-Parasite Interactions • Room 225 C

2:45 – 4:00 p.m.

POD TALK: A Conversation with Phytopathologists of Distinction Jim Cook and Allison Tally • Room 224

PYHTOVIEWS: Seedborne vs. Seed-Transmitted Plant Pathogens: The Curious Case of *Phomopsis* spp. on Spinach Seed • Room 221 B

TECHNICAL SESSION: Integrated Pest Management • Room 221 C

TECHNICAL SESSION: Root Phytobiome • Room 225 B

Changing Landscapes of Plant Pathology

MONDAY morning

8:00 – 9:15 a.m.

HOT TOPIC: Highs and Lows of Cannabis Pathology • Room 221 A

SPECIAL SESSION: Best Practices in Diagnostic Test Development and Deployment • Room 221 D

SPECIAL SESSION: New Products and Services, Part I (*ends at 9:30 a.m.*) • Room 221 B

SPECIAL SESSION: Phytobiomes 2.0: Functional Approaches in Forest Ecosystem • Room 225 A

TECHNICAL SESSION: Fungal Diseases • Room 221 C

TECHNICAL SESSION: Phenotyping and Population Dynamics • Room 225 B

TECHNICAL SESSION: Resistance Identification • Room 225 D

TECHNICAL SESSION: Virus Biology • Room 225 C

MONDAY afternoon

1:00 – 2:15 p.m.

HOT TOPIC: Science as Story and Story as Science: Telling Plant Pathology Research Stories • Room 221 A

POD TALK: A Conversation with Phytopathologists of Distinction Charlie Delp and Sue Tolin • Room 224

SPECIAL SESSION: A Bridge Over Troubled Ecosystems: How Host Cultivation Creates Novel Pathogens • Room 221 D

SPECIAL SESSION: Genomics-Based Approaches Facilitate Diagnostic and Population Genetic Marker Development for Plant Pathogens • Room 221 B

SPECIAL SESSION: Phyllosphere Microbial Assemblages: Friends, Foes, and Strangers • Room 221 C

SPECIAL SESSION: Recruiting NextGen Scientists: Strategies for Inclusive Outreach • Room 225 A

TECHNICAL SESSION: Bacterial Virulence and Effectors • Room 225 B

TECHNICAL SESSION: Fungicide Resistance • Room 225 D

TECHNICAL SESSION: Oomycete Diversity • Room 225 C

TUESDAY morning

8:30 – 9:45 a.m.

SPECIAL SESSION: Re-emergence of Bacterial Blight of Cotton • Room 221 C

TECHNICAL SESSION: Oomycetes • Room 225 B

TECHNICAL SESSION: Viral-Host Interactions
• Room 221 B

8:30 – 11:30 a.m.

SPECIAL SESSION: 17th I. E. Melhus Graduate Student Symposium: Today's Students Addressing Tomorrow's Challenges Concerning Plant Diseases and Phytobiomes • Room 225 A

SPECIAL SESSION: Addressing Nematode Parasitic Tactics Through Biology • Room 225 C

SPECIAL SESSION: The Rise and Management Challenges of Multi-Fungicide-Resistant Pathogens
• Room 221 D

SPECIAL SESSION: Translation of Basic Biological Control Research into Effective Grower Products and Practices • Room 221 A

10:15 – 11:30 a.m.

HOT TOPIC: Next Generation of Plant Pathologists Exploiting Sequencing Strategies to Further Our Understanding of Plant Virus-Insect Vector Interactions
• Room 221 C

TECHNICAL SESSION: Pathogen Virulence and Effectors • Room 225 B

SPECIAL SESSION: New Products and Services, Part II (*ends at 11:45 a.m.*) • Room 221 B

TUESDAY afternoon

1:00 – 2:15 p.m.

HOT TOPIC: Navigating Contentious Conversations
• Room 221 A

SPECIAL SESSION: Plant Pathologists of the Future: Showcasing the Top Graduate Students from the APS Division Meetings • Room 221 B

SPECIAL SESSION: Pursuit of Solutions to Mycotoxin Risks by Next Generation Plant Pathologists
• Room 225 A

SPECIAL SESSION: The Socioeconomic Impact of New and Re-emerging Bacterial Diseases: A National Perspective • Room 221 D

TECHNICAL SESSION: Biological Control
• Room 221 C

TECHNICAL SESSION: Epidemiology and Quantification of Disease • Room 225 B

TECHNICAL SESSION: Fungicide Resistance and Fitness • Room 225 C

WEDNESDAY afternoon

1:00 – 2:15 p.m.

SPECIAL SESSION: Labs, A Mechanism To Enhance Learning In The Changing World of Plant Pathology
• Room 221 B

TECHNICAL SESSION: Floral and Fruit Diseases
• Room 221 C

TECHNICAL SESSION: Virology Detection and Descriptions • Room 225 B

1:00 - 4:00 p.m.

SPECIAL SESSION: Adapt, Change and Improvise: How to Control Diseases as the Climate is Changing
• Room 221 D

SPECIAL SESSION: New Insights into NLR on Plant Immunity: Pathogen Recognitions, Molecular Interactions, and Novel Disease Control Strategies
• Room 221 A

2:45– 4:00 p.m.

SPECIAL SESSION: An Ever-Changing Extension Environment: Keeping a Foot in the Furrow and a Hand in Cyberspace • Room 221 B

TECHNICAL SESSION: Chemical Control
• Room 221 C

TECHNICAL SESSION: Mycotoxins • Room 225 B

DAILY MEETING SCHEDULE AND SESSIONS



*Meetings take place in the San Antonio Henry B. González Convention Center (CC) unless otherwise noted.
Field Trip and other bus departures leave from the Grand Hyatt Hotel.*

■ SATURDAY, AUGUST 5

7:30 a.m. – 5:00 p.m.	Field Trip: Ornamental	Offsite
8:00 – 11:30 a.m.	Workshop: Population Genomics in R	301A, CC
8:00 a.m. – 5:00 p.m.	Workshop: Principles of Diagnostic Assay Validation	303A, CC
8:30 a.m. – 4:30 p.m.	APS Leadership Institute: Managing Change with Resilience, Focus, and Influence	Travis CD, Hyatt
9:00 – 11:00 a.m.	APS Financial Advisory Committee Meeting	Independence, Hyatt
9:00 a.m. – 4:00 p.m.	Workshop: Morphological ID of Phytopathogenic Fungi	Bonham E, Hyatt
10:00 – 11:30 a.m.	<i>Plant Health Progress</i> Editorial Board Meeting, <i>by invitation</i>	Travis B, Hyatt
10:00 a.m. – 5:00 p.m.	Workshop: Meta-Analysis for Combining Results from Multiple Studies in Plant Pathology	301B, CC
12:00 – 2:30 p.m.	APS PRESS Board Meeting	Travis A, Hyatt
12:00 – 6:00 p.m.	Registration Open	Hall 1 Registration
1:00 – 5:00 p.m.	Workshop: Design Matters! Experimental Design in Lab, Greenhouse, and Field Settings	Bonham D, Hyatt
1:00 – 5:00 p.m.	Workshop: Fact Finders for Agriculture – Hands-on Workshop for Use of USDA National Agriculture Statistics Service (NASS) Databases	Bonham C, Hyatt
1:00 – 5:00 p.m.	GDM New ARM Software Tips and Techniques Workshop	303C, CC
1:00 – 5:00 p.m.	North American Fungicide Resistance Action Committee (NA-FRAC) Meeting	Independence, Hyatt
2:00 – 5:00 p.m.	Workshop: The Current State of Introductory Plant Pathology Courses: What We Learned and How You Can Improve Your Own Course	Republic B, Hyatt
3:00 – 4:30 p.m.	APS Committee Chair/Vice Chair Orientation	301C, CC
3:00 – 5:00 p.m.	APS Publications Board Meeting	Travis B, Hyatt
4:30 – 5:30 p.m.	First Timers' Orientation	303B, CC
5:00 – 6:00 p.m.	Microbial Forensics Interest Group Meeting	302B, CC
5:00 – 6:00 p.m.	<i>PDMMR</i> Editors' Meeting	Travis A, Hyatt
5:30 – 6:00 p.m.	Undergraduate Student Primer	303B, CC
6:00 – 7:00 p.m.	Committee Meetings (<i>open to any meeting attendee</i>)	
	• Bacteriology Committee • Biotechnology Committee • Chemical Control Committee • Crop Loss Assessment and Risk Evaluation (CLARE) Committee • Diseases of Ornamental Plants Committee • Molecular and Cellular Phytopathology Committee • Mycology Committee • Nematology Committee • Plant Pathogen and Disease Detection Committee • Teaching Committee • Vector-Pathogen Complexes Committee	Republic B, Hyatt 302C, CC 301B, CC Bonham C, Hyatt Bonham D, Hyatt 303C, CC 302A, CC 302B, CC 301A, CC 301C, CC Bonham A, Hyatt
7:15 – 8:15 p.m.	Committee Meetings (<i>open to any meeting attendee</i>)	
	• Committee for Diversity and Equality • Diagnostics Committee • Emerging Diseases and Pathogens Committee • Evolutionary Genetics and Genomics Committee • Forest Pathology Committee • Graduate Student Committee • Integrated Plant Disease Management Committee • Mycorotoxicology Committee • Phyllosphere Microbiology Committee • Postharvest Pathology Committee • Soil Microbiology and Root Diseases Committee • Tropical Plant Pathology Committee	301A, CC 301C, CC 301B, CC Bonham C, Hyatt Bonham B, Hyatt 303C, CC Bonham E, Hyatt Bonham D, Hyatt 225D, CC Bonham A, Hyatt 303A, CC 302C, CC

8:30 – 9:30 p.m.

Committee Meetings (*open to any meeting attendee*)

Biological Control Committee
Collections and Germplasm Committee
Epidemiology Committee
Extension Committee
Host Resistance Committee
Industry Committee
Pathogen Resistance Committee
Regulatory Plant Pathology Committee
Seed Pathology Committee
Turfgrass Pathology Committee
Virology Committee

301A, CC
Travis B, Hyatt
Bonham D, Hyatt
301B, CC
302C, CC
Bonham C, Hyatt
301C, CC
Bonham C, Hyatt
Bonham A, Hyatt
Bonham B, Hyatt
303C, CC

APS Leadership Institute: Managing Change with Resilience, Focus, and Influence

Saturday, August 5

8:30 a.m. – 4:30 p.m.; Travis CD, Hyatt

Organizers: Staci Rosenberger, Monsanto Company and
APS Leadership Institute Chair

Sponsoring Committee: APS Leadership Institute
Committee

Financial Sponsors: APS Council and Monsanto
Company



This year you will benefit from an interactive workshop focused on managing and leading change. You will learn approaches to develop resilience and the strategies you need to stay focused and effective in times of change and uncertainty. This year's workshop features an expert facilitator in this core leadership area, Sherry Harsch-Porter, Ph.D., president of PorterBay Insight. The workshop fee, substantially supported by APS Council and Monsanto, includes an individual work style assessment, workshop materials, coffee breaks, and lunch with a networking opportunity. **Preregistration required.**



DAILY MEETING SCHEDULE AND SESSIONS

Meetings take place in the San Antonio Henry B. González Convention Center (CC) unless otherwise noted.

■ SUNDAY, AUGUST 6

7:00 – 9:00 a.m.	APS Education Center Editorial Board Meeting	Independence, Hyatt
7:00 – 9:00 a.m.	Vegetable Seed Industry Breakfast, <i>by invitation</i>	303C, CC
7:00 a.m. – 6:00 p.m.	Registration Open	Hall 1 Registration
8:00 – 9:00 a.m.	APS <i>Phytopathology</i> Senior Editors' Meeting	302C, CC
8:00 – 9:00 a.m.	APS <i>Plant Disease</i> Senior Editors' Meeting	302A, CC
8:00 a.m. – 2:00 p.m.	Exhibit Set-Up	Exhibit Hall 1
8:30 – 9:00 a.m.	Moderator Orientation (for moderators of all scientific sessions)	221A, CC
8:30 – 10:00 a.m.	APS <i>Phytobiomes</i> Senior and Associates Editors Meeting	222, CC
9:00 – 10:00 a.m.	<i>Phytopathology</i> Editorial Board Meeting	302C, CC
9:00 – 10:00 a.m.	<i>Plant Disease</i> Editorial Board Meeting	302A, CC
10:30 a.m. – 12:00 p.m.	Opening General Session and Awarding of Fellows followed by Keynote Speaker Jack Bobo, "Can Agriculture Save the Planet before It Destroys It?" (live-streamed session)	Lila Cockrell Theatre, CC
12:00 – 1:00 p.m.	Lunch Break	
12:00 – 2:00 p.m.	Division Officers' Luncheon	302C, CC
12:00 – 2:00 p.m.	Poster Set-Up	Exhibit Hall 1
1:00 – 2:15 p.m.	Scientific Sessions	
	OPENING SESSION FOLLOW-UP with Keynote Speaker Jack Bobo	221B, CC
	TECHNICAL SESSION: Genetics of Resistance and Virulence	221C, CC
	TECHNICAL SESSION: Pathogen Detection and Diagnosis	225B, CC
1:00 – 4:00 p.m.	Scientific Sessions	
	SPECIAL SESSION: Beautiful Efficiency: The Multifunctional Nature of Virus Proteins	221A, CC
	SPECIAL SESSION: Schroth – Faces of the Future Session: Host Resistance and Host-Pathogen Interactions	225A, CC
	SPECIAL SESSION: Show Me the Money! Assessing the Value of Disease Control in a Changing Landscape (<i>live-streamed session</i>)	221D, CC
	SPECIAL SESSION: Unfriendly and Beneficial Plant-Parasite Interactions	225C, CC
1:30 – 3:00 p.m.	APS 2026 Professional Development Forum, <i>by invitation</i>	Travis AB, Hyatt
1:30 – 3:00 p.m.	APS-IPS Working Group Meeting, <i>by invitation</i>	Travis C, Hyatt
1:30 – 3:00 p.m.	PMN Editorial Board Meeting	Independence, Hyatt
2:45 – 4:00 p.m.	Scientific Sessions	
	POD TALK: A Conversation with Phytopathologists of Distinction Jim Cook and Allison Tally (<i>see page 19 for description</i>)	224, CC
	PHYTOVIEWS: Seedborne vs. Seed-Transmitted Plant Pathogens: The Curious Case of <i>Phomopsis</i> spp. on Spinach Seed • ICPP2018 Preview Topic (<i>see page 21 for description</i>)	221B, CC
	TECHNICAL SESSION: Integrated Pest Management	221C, CC
	TECHNICAL SESSION: Root Phytobiome	225B, CC
3:00 – 4:00 p.m.	Leadership Institute Committee Meeting	Travis C, Hyatt
3:00 – 4:00 p.m.	USABlight Committee Meeting	222, CC
3:00 – 4:30 p.m.	NPDR Town Hall	302A, CC
4:00 – 6:00 p.m.	APS PRESS Bookstore Open	Exhibit Hall 1
4:00 – 6:00 p.m.	Social Gathering with Exhibition and Posters	Exhibit Hall 1
4:00 – 6:00 p.m.	Poster Viewing	Exhibit Hall 1
5:00 – 6:00 p.m.	National Plant Disease Recovery System (NPDRS) Meeting	302A, CC
6:00 – 7:00 p.m.	University Networking Socials	Exhibit Hall 1
	• Colorado State University • Cornell University • Iowa State University • Louisiana State University • Michigan State University • North Carolina State University • Ohio State University • Oregon State University • Penn State University • University of Florida • University of Georgia • University of Illinois • University of Minnesota • University of Wisconsin-Madison	
6:00 – 7:00 p.m.	APS Public Policy Board (PPB) Meeting, <i>invitation only</i>	303B, CC

7:00 – 9:00 p.m.
7:00 – 9:30 p.m.
7:00 – 10:00 p.m.

New! Networking Event: Pitch120 Training and Practice
APS Public Policy Board (PPB) Meeting, *open to all meeting attendees*
Ornamental Virus Discussion Group

Travis AB, Hyatt
303B, CC
302B, CC

Back by popular demand!

Conversations with Phytopathologists of Distinction (PODs)

Sunday, August 6

2:45 – 4:00 p.m.; Room 224, Convention Center

A Conversation with Phytopathologist of Distinction Jim Cook: From Farmer to a Farmer's Scientist



Jim Cook, *Dean & Professor Emeritus, Washington State University*

Jim's story: Growing up on a farm and the oldest of eight siblings, I learned first hand about farming at an early age. My intention to be a farmer began to change during my second year at North Dakota State University when I got a job with ARS plant pathologist Roland Timian. I loved chemistry and could now envision a career

in science, a decision finalized when my fiancée announced that she did not intend to live on a farm. After an undergraduate major in agronomy, I was the first to receive a graduate degree in plant pathology at NDSU. At UC Berkeley, I did my Ph.D. thesis under W. C. Snyder on Fusarium root rot of beans. This set me on a course of research on soilborne plant pathogens, crediting my background in agronomy and growing up on a farm that led to my *Forty Years of Field Research on Root Diseases of Wheat*.

A Conversation with Phytopathologist of Distinction Allison Tally: Corporate Plant Pathologist – Jack-of-All-Trades, Master of None



Allison Tally, *Syngenta Technical Lead (retired), Greensboro, NC*

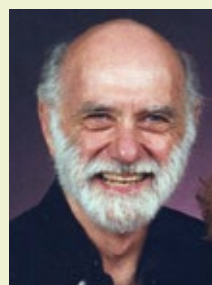
Allison's story: When I finished college, I knew I liked plants but was unsure what that meant for my future career. With intentions of conducting environmental impact assessments, my grad advisor suggested a plant pathology class and I was hooked! While my research projects included both basic and applied aspects, my

long-term goal became clear—a career in industry. To facilitate that, I made as many contacts as I could while assisting in field trials. The timing was good as companies were 'diversifying.' "She's not afraid to get dirty" was one of the key selling points! With hands-on experience with weed and insect control as well as disease management, I understood many of the challenges and practices of growers. Being willing to learn, by stepping up to challenges, knowing when to "agree to disagree," and keeping to commitments, enabled a very rewarding career as a plant pathologist in the corporate world. During 34 years in industry, there have been some great successes, a few disappointments, but never a dull moment—there was simply no time!

Monday, August 7

1:00 – 2:15 p.m.; Room 224, Convention Center

A Conversation with Phytopathologist of Distinction Charlie Delp: *Phytophthora*: The Full Circle of My Career



Charlie Delp, *DuPont Senior Research Scientist, E. I. du Pont de Nemours*

Charlie's story: My excitement with *Phytophthora infestans* caught the attention of a botany professor at Colorado A&M. Following his advice to pursue a Ph.D. in plant pathology at UC Davis led to 32 years as a research scientist with the DuPont Company. Our discovery of systemic fungicides sparked international interest when

I introduced Benlate® at the 1st International Congress for Plant Pathology in 1968. The creation of industries' Fungicide Resistance Action Committee (FRAC) entailed working with "competitive scientists." Serving as secretary of APS, my professional family, and organizing OIP was rewarding. After retirement, I was an AAAS Congressional Science Fellow on the House Committee on Hunger and conducted Fungicide Resistance Management workshops on four continents. Volunteering in the U.S. Peace Corps in Samoa to get them back into production after devastation by taro leaf blight, *Phytophthora colocasiae*, was the satisfying culmination to a career enriched by professional contacts near and far.

A Conversation with Phytopathologist of Distinction Sue Tolin: A Variable Viral Career



Sue Tolin, *Professor Emerita, Department of Plant Pathology, Physiology and Weed Science, Virginia Polytechnic Institute and State University*

Sue's story: I've always had an interest in agriculture, being raised on a small farm in rural Indiana, along with cows, pigs, chickens, plants, and siblings. I followed my father to Purdue where I found an agricultural science major, but not without

admonitions that it was too rigorous and girls just didn't enter this field. My advisor, plant pathologist Ralph Shay, steered me through grad-school prep courses and suggested I might go into virology. Shay and John Bancroft helped me find a fit with Myron Brakke at Nebraska in 1960. In looking back, I feel I was "present at the flood" as TMV structure, infectious RNA, and the genetic code had just come out. After my first APS meeting, I was hooked on virology and plant pathology. My career gave me opportunities to explore virus identity and management globally, advance diagnostics, apply genomics to host resistance, and have the freedom to delve into public policy and regulatory affairs of concern to plant pathologists through activities with USDA and APS.

DAILY MEETING SCHEDULE AND SESSIONS

Meetings take place in the San Antonio Henry B. González Convention Center (CC) unless otherwise noted.

MONDAY, AUGUST 7

6:30 – 8:00 a.m.	Extension Plant Pathologists' Breakfast	303C, CC
7:30 a.m. – 6:00 p.m.	Registration Open	Hall 1 Registration
8:00 a.m. – 6:00 p.m.	Poster Viewing	Exhibit Hall 1
8:00 – 9:15 a.m.	Scientific Sessions	
	HOT TOPIC: Highs and Lows of Cannabis Pathology	221A, CC
	SPECIAL SESSION: Best Practices in Diagnostic Test Development and Deployment (<i>live-streamed session</i>)	221D, CC
	SPECIAL SESSION: New Products and Services, Part I, <i>ends at 9:30 a.m.</i>	221B, CC
	SPECIAL SESSION: Phytobiomes 2.0: Functional Approaches in Forest Ecosystem • ICPP2018 Preview Topic	225A, CC
	TECHNICAL SESSION: Fungal Disease	221C, CC
	TECHNICAL SESSION: Phenotyping and Population Dynamics	225 B, CC
	TECHNICAL SESSION: Resistance Identification	225 D, CC
	TECHNICAL SESSION: Virus Biology	225C, CC
8:00 – 10:00 a.m.	Take-a-Walk Session: San Antonio River Improvements Project—Mission Reach, <i>preregistration required. Meet at the APS Registration area, at 7:45 a.m., bus transportation will leave promptly at 8:00 a.m. Requires 1–1.5 miles of walking once at the destination.</i>	Offsite
9:30 – 11:30 a.m.	Plenary Session and Awards: Changing Landscapes of Plant Pathology (<i>see page 11</i>) (<i>live-streamed session</i>)	Lila Cockrell Theatre, CC
11:00 a.m. – 6:00 p.m.	APS PRESS Bookstore Open	Exhibit Hall 1
11:30 a.m. – 1:00 p.m.	Lunch Break	
11:30 a.m. – 1:00 p.m.	Graduate Student & Industry Lunch	301AB, CC
11:30 a.m. – 1:00 p.m.	Widely Prevalent Plant Pathogenic Fungi Working Group, <i>by invitation</i>	Independence, Hyatt
11:30 a.m. – 1:30 p.m.	Storkan-Hanes-McCaslin Research Foundation Luncheon, <i>by invitation</i>	Presidio C, Hyatt
11:30 a.m. – 6:00 p.m.	Exhibits Open	Exhibit Hall 1
11:30 a.m. – 6:00 p.m.	OIP Silent Auction	Exhibit Hall 1
12:00 – 2:00 p.m.	USDA, ARS Meeting, <i>brown bag lunch</i>	303A, CC
1:00 – 2:15 p.m.	Scientific Sessions	
	HOT TOPIC: Science as Story and Story as Science: Telling Plant Pathology Research Stories (<i>see page 34 for description</i>)	221A, CC
	POD TALK: A Conversation with Phytopathologists of Distinction Charlie Delp and Sue Tolin (<i>see page 19 for description</i>)	224, CC
	SPECIAL SESSION: A Bridge Over Troubled Ecosystems: How Host Cultivation Creates Novel Pathogens (<i>live-streamed session</i>)	221D, CC
	SPECIAL SESSION: Genomics-Based Approaches Facilitate Diagnostic and Population Genetic Marker Development for Plant Pathogens	221B, CC
	SPECIAL SESSION: Phyllosphere Microbial Assemblages: Friends, Foes, and Strangers	221C, CC
	SPECIAL SESSION: Recruiting NextGen Scientists: Strategies for Inclusive Outreach	225A, CC
	TECHNICAL SESSION: Bacterial Virulence and Effectors	225B, CC
	TECHNICAL SESSION: Fungicide Resistance	225D, CC
	TECHNICAL SESSION: Oomycete Diversity	225C, CC
1:30 – 3:00 p.m.	APS-SBF Working Group Meeting, <i>by invitation</i>	Independence, Hyatt
2:30 – 5:00 p.m.	Poster Viewing with Authors, Poster Huddles, and One-to-One (1:1) Conversation with an Expert	Exhibit Hall 1
	2:30 – 3:00 p.m. Poster Huddles	
	HUDDLE #1 – Strategies for managing diseases caused by microsclerotia-producing fungi	
	HUDDLE #2 – Challenges to developing effective strategies for managing emerging plant diseases	
	HUDDLE #3 – Innovative approaches for plant disease management	
	2:30 – 4:00 p.m. One-to-One (1:1): Conversation with an Expert (<i>advanced sign-up encouraged, see page 10 for description</i>)	
	3:00 – 5:00 p.m. Poster Viewing with Authors	
	3:00 – 4:00 p.m. Posters 1 – 320 (<i>even numbered posters</i>)	
	4:00 – 5:00 p.m. Posters 321 – 645 (<i>even numbered posters</i>)	
3:30 – 5:00 p.m.	APS Divisional Forum	Travis B, Hyatt

5:00 – 6:00 p.m.

APS Connects – Networking Social

*Grab a beverage and some popcorn and connect with colleagues and friends.
Drink ticket provided with registration.*

5:30 – 6:00 p.m.

Early Career Professionals Committee Meeting

6:00 – 7:00 p.m.

Early Career Professionals' Social with Employer Networking Opportunity

6:00 – 7:00 p.m.

Graduate Student Social

6:00 – 7:00 p.m.

Publications Senior Editors' Reception, *by invitation*

6:30 – 9:00 p.m.

Industry & Extension Networking Event, *preregistration required.*

Sunset Station is 4–5 blocks from the convention center.

Transportation is not provided. Directional maps were given out at registration and are also available at the APS Registration Desk.

Exhibit Hall 1

303A, CC

303A, CC

Republic A–C, Hyatt

302A, CC

Depot Room, Sunset Station

PhytoViews

Your opportunity to engage in facilitated conversations as we explore all points of view on these topics of interest!

Seedborne vs. Seed-Transmitted Plant Pathogens: The Curious Case of *Phomopsis* spp. on Spinach Seed

Sunday, August 6, 2:45 – 4:00 p.m.; Room 221B, Convention Center

Organizer and Moderator: Ron Walcott, *The University of Georgia*

Presenters:

- Lindsey du Toit, *WSU Mount Vernon Northwestern Washington Research & Extension Center (NWREC), Mount Vernon, WA, U.S.A.*
- Ric Dunkle, *American Seed Trade Association, Alexandria, VA, U.S.A.*
- Christina Devorshak, *USDA/APHIS – PPQ, CPHST, Raleigh, NC, U.S.A.*



This PhytoView session will explore the nuanced differences between seedborne and seed-transmitted pathogens, including the implications of these terms for researchers, seed producers, growers, and regulatory agencies. Three panelists will share the connotations of seedborne vs. seed-transmitted from the perspectives of a university seed pathologist, a commercial seed producer, and a regulatory agency. Finally, *Phomopsis* spp. detected on spinach seed will be used to highlight a unique challenge presented by seedborne organisms that might not be seed transmitted, and for which the taxonomic state of flux of this genus has prevented the development of a resolution to a seed trade quarantine.

Take-a-Walk Sessions

Out of the convention center and into where the action is! Take-a-Walk Sessions focus on local issues in plant pathology in the environment where issues exist....this year on the San Antonio River Walk.



Monday, August 7, and repeated Tuesday, August 8

8:00 – 10:00 a.m. • Preregistration required, ticketed session.

Meet at the APS Registration area at 7:45 a.m., bus transportation will leave promptly at 8:00 a.m. from the Grand Hyatt. Requires 1–1.5 miles of walking once at the destination.

Take-a-Walk Session:

San Antonio River Improvements Project—Mission Reach

Presenter: Matthew Drifill, *Recreation Superintendent, San Antonio River Authority*

The San Antonio River Improvements Project includes the largest urban river restoration in the United States, which extended the Historic River Walk to both the north and south, expanding the opportunities for the 11.5 million visitors who visit the San Antonio River annually. This trip will take participants along the 8-mile Mission Reach ecosystem restoration project. This project has more than 400 acres of native plantings, including 23,000+ native trees. Participants will learn about the project funding, construction, management, native vegetation, community governance, and ongoing ecosystem management. In addition to a restored riverine environment, the Mission Reach also provides recreational opportunities, connects four of San Antonio's 18th century missions that are important historical and cultural resources, provides for significant economic growth opportunities, and is a recently inscribed UNESCO World Heritage Site. Preregistration is required. Attendance is limited.

DAILY MEETING SCHEDULE AND SESSIONS

Meetings take place in the San Antonio Henry B. González Convention Center (CC) unless otherwise noted.

TUESDAY, AUGUST 8

7:00 – 8:30 a.m.	Sustaining Associates' Breakfast, <i>by invitation</i>	303B, CC
7:00 – 9:00 a.m.	Annual Meeting Board Meeting, <i>by invitation</i>	222, CC
7:30 – 9:30 a.m.	Small Fruit Diseases Workers' Discussion	303A, CC
7:30 a.m. – 5:30 p.m.	Registration Open	Hall 1 Registration Offsite
8:00 – 10:00 a.m.	Take a Walk Session: San Antonio River Improvements Project—Mission Reach, <i>preregistration required. Meet at the APS Registration area at 7:45 a.m., bus transportation will leave promptly at 8:00 a.m. Requires 1–1.5 miles of walking once at the destination.</i>	
8:00 – 11:00 a.m.	Academic Unit Leaders' Forum Meeting	303C, CC
8:00 a.m. – 6:00 p.m.	Poster Viewing	Exhibit Hall 1
8:30 – 9:30 a.m.	Office of Public Sector Relations (OPSR) Board Meeting	303B, CC
8:30 – 9:45 a.m.	Scientific Sessions	
	SPECIAL SESSION: Re-emergence of Bacterial Blight of Cotton	221C, CC
	TECHNICAL SESSION: Oomycetes	225B, CC
	TECHNICAL SESSION: Viral-Host Interactions	221B, CC
8:30 – 11:30 a.m.	Scientific Sessions	
	SPECIAL SESSION: 17th I. E. Melhus Graduate Student Symposium: Today's Students Addressing Tomorrow's Challenges Concerning Plant Diseases and Phytobiomes	225A, CC
	SPECIAL SESSION: Addressing Nematode Parasitic Tactics Through Biology	225C, CC
	SPECIAL SESSION: The Rise and Management Challenges of Multi-Fungicide-Resistant Pathogens • ICPP2018 Preview Topic (live-streamed session)	221D, CC
	SPECIAL SESSION: Translation of Basic Biological Control Research into Effective Grower Products and Practices	221A, CC
9:00 a.m. – 5:00 p.m.	APS PRESS Bookstore Open	Exhibit Hall 1
9:30 a.m. – 12:00 p.m.	APS Foundation Board Meeting, <i>by invitation</i>	302C, CC
10:00 a.m. – 6:00 p.m.	Exhibits Open	Exhibit Hall 1
10:15 – 11:30 a.m.	Scientific Sessions	
	HOT TOPIC: Next Generation of Plant Pathologists Exploiting Sequencing Strategies to Further Our Understanding of Plant Virus-Insect Vector Interactions	221C, CC
	• ICPP2018 Preview Topic	
	SPECIAL SESSION: New Products and Services, Part II, <i>ends at 11:45 a.m.</i>	221B, CC
	TECHNICAL SESSION: Pathogen Virulence and Effectors	225B, CC
11:30 a.m. – 1:00 p.m.	Lunch Break	
11:45 a.m. – 12:45 p.m.	Sugarcane Orange Rust Meeting, <i>brown bag lunch</i>	Independence, Hyatt
12:00 – 1:00 p.m.	APHIS Widely Prevalent Bacteria Committee Meeting, <i>by invitation</i>	222, CC
1:00 – 2:00 p.m.	<i>Phytopathology News</i> Advisory Committee Meeting	Travis A, Hyatt
1:00 – 2:15 p.m.	Scientific Sessions	
	HOT TOPIC: Navigating Contentious Conversations	221A, CC
	SPECIAL SESSION: Plant Pathologists of the Future: Showcasing the Top Graduate Students from the APS Division Meetings (<i>ends at 2:30 p.m.</i>)	221B, CC
	SPECIAL SESSION: Pursuit of Solutions to Mycotoxin Risks by Next-Generation Plant Pathologists	225A, CC
	SPECIAL SESSION: The Socioeconomic Impact of New and Re-emerging Bacterial Diseases: A National Perspective • ICPP2018 Preview Topic (live-streamed session)	221D, CC
	TECHNICAL SESSION: Biological Control	221C, CC
	TECHNICAL SESSION: Epidemiology and Quantification of Disease	225B, CC
	TECHNICAL SESSION: Fungicide Resistance and Fitness	225C, CC
2:00 – 3:30 p.m.	APS-CSPP Working Group Meeting, <i>by invitation</i>	Presidio B, Hyatt
2:30–5:00 p.m.	Career Fair	Exhibit Hall 1
2:30 – 5:00 p.m.	Poster Viewing with Authors and Poster Huddles	Exhibit Hall 1
	2:30 – 3:00 p.m. Poster Huddles	
	HUDDLE #4 – Pathogenicity and virulence determinants of soilborne fungal pathogens	
	HUDDLE #5 – Novel approaches for screening for plant disease resistance	
	HUDDLE #6 – Advances in phytobiome research	
	3:00 – 5:00 p.m. Poster Viewing with Authors	
	3:00 – 4:00 p.m. Posters 1 – 320 (odd numbered posters)	
	4:00 – 5:00 p.m. Posters 321 – 645 (odd numbered posters)	

3:30 – 5:00 p.m.	Presidential Meeting of Plant Pathology Organizations, <i>by invitation</i>	302C, CC
5:00 – 6:00 p.m.	Idea Cafés <i>Small round-table discussions on topics of interest (see page 23 for description)</i>	Exhibit Hall 1
5:00 – 6:30 p.m.	APS Past Presidents' Meeting, <i>by invitation</i>	Travis A, Hyatt
6:00 – 7:30 p.m.	Diagnostics Working Group Meeting	302C, CC
6:00 – 8:00 p.m.	Wheat-Mite-Virus Project Meeting	Independence, Hyatt
6:30 – 7:30 pm.	LGBTQA Social and Networking Hour <i>Open to all meeting attendees, cash bar, no preregistration required.</i>	Veranda Room, Casa Rio Restaurant
7:30 – 9:30 p.m.	Committee for Diversity and Equality presents “STRIDE for the Future” Workshop, <i>preregistration required.</i>	Veranda Room, Casa Rio Restaurant

IDEA CAFÉS

Enhance your scientific content, find solutions to existing problems, discover innovative ideas in your area of research or outreach! Idea Cafés are your opportunity for an in-depth round-table discussion on an area of interest. Meet great minds in plant pathology in an informal setting. One table per topic, located at specified tables at the front entrance area of the Exhibit Hall. Topics are listed as determined at print time. **Check the addendum for any changes in topic areas to be discussed and/or moderators.**

Tuesday, August 8

5:00 – 6:00 p.m.

- Cultural Sensitivities and Culture Shock – Margarita L. Bateman, *APHIS*
- Family-Friendly APS: How Did We Do? – Renee Rioux, *Bayer*
- Framework for Diagnostic Assay Validation Research – Kitty Cardwell, *Oklahoma State University*
- Give Me Spots on My Apples: Can Phytopathologists Contribute to the Anti-Food Waste Movement? – Lindsey Triplett, *The Connecticut Agricultural Experiment Station*
- Graduate School 101: Everything Someone Applying or in Their First Year Needs to Know – Carolee Bull, *Pennsylvania State University*; Alejandra Huerta, *Colorado State University*
- Next-Generation Seed Health Testing: Using DNA Metabarcoding for Crop Seed Microbial Profiling. What Are the Challenges and Opportunities? – Tracy Bruns, *Iowa State University*
- Science Communication: How Can We Actively Work Toward Bridging the Gap? – Lauri Lutes, *Oregon State University*
- Seed Chain Challenge – Farmers Ask: “Why Can’t You Stop Plant Viruses from Invading Our Fields?” – Amer Fayad, *Virginia Tech*
- The Phosphite Fungicides – What They Can and Cannot Do – Tim Brenneman, *University of Georgia-Athens*
- The Potato Blackleg Epidemic – Jianjun (Jay) Hao, *University of Maine*

Wednesday, August 9

9:30 – 10:30 a.m.

- Disease Management and Outreach Needs for Rapid Adaptation to Climate Changes and Water Scarcity – Cassandra Swett, *University of California-Davis*
- Effects of Ambient Ozone Pollution on Plant-Pathogen Interactions and Food Safety – Al-Sayeed Mashaheeth, *North Carolina State University*
- Endornaviruses – What Are They and What Do They Do To Plants? – Rodrigo A. Valverde, *Louisiana State University*
- How to Combat Diseases in Organic Agriculture? – Shane Zhou, *Texas A&M University*
- Imposter Syndrome and You: A Discussion of a Little-Discussed Phenomenon – Michelle Marks and Katelyn Butler, *University of Wisconsin-Madison*
- Microbial Assemblages: Friends, Foes, and Strangers – Robin Choudhury, *University of Florida*
- Selling Innovation: How Do We Get Others to Join Us in Thinking Outside the Box? – Renee Rioux, *Bayer*
- Teaching Biosecurity and Microbial Forensics – Francisco Ochoa Corona, *Oklahoma State University*
- The Looming Threat of Multiple Fungicide Resistance – Katherine Stevenson, *University of Georgia-Athens*
- What I Wish I Learned in Grad School – Ana Cristina Fulladolsa and Alejandra Huerta, *Colorado State University*
- Why Light Matters – Anticipated and Unanticipated Effects of Light on Plant Pathogens – David Gadoury, *Cornell University*, Mark Rea, *RPI Lighting Research Center*



DAILY MEETING SCHEDULE AND SESSIONS

Meetings take place in the San Antonio Henry B. González Convention Center (CC) unless otherwise noted.

■ WEDNESDAY, AUGUST 9

7:00 – 9:00 a.m.	Food Safety Interest Group	Independence, Hyatt
7:30 – 9:30 a.m.	APS Awards and Honors Committee Meeting, <i>by invitation</i>	Travis A, Hyatt
7:30 – 9:30 a.m.	Office of International Programs (OIP) Board Meeting	303B, CC
7:30 a.m. – 2:00 p.m.	Registration	Hall 1 Registration
8:00 – 10:30 a.m.	Exhibits Open	Exhibit Hall 1
8:00 – 11:00 a.m.	APS PRESS Bookstore	Exhibit Hall 1
9:00 – 10:30 a.m.	PhytoCafe featuring Poster Huddles, Idea Cafés , One-to-One (1:1) Conversation with an Expert plus Exhibits and Poster Viewing—coffee, tea, and light breakfast snack provided	Exhibit Hall 1
	9:00 – 9:30 a.m. Poster Huddles	
	HUDDLE #7 – Pros & cons of pathogen detection strategies	
	HUDDLE #8 – Improved understanding of pathogen dispersal/dissemination.	
	HUDDLE #9 – Advances in understanding fungicide resistance	
	9:00 – 10:30 a.m. Poster Viewing	
	9:30 – 10:30 a.m. Idea Cafés	
	<i>Small round-table discussions on topics of interest (see page 23 for description)</i>	
	9:30 – 10:30 a.m. One-to-One (1:1): Conversation with an Expert	
	<i>(advanced sign-up encouraged, see page 10 for description)</i>	
9:30 – 10:30 a.m.	New Session! Committees: How to Be Effective Session	221A, CC
	<i>(open to any meeting attendee)</i>	
10:30 – 11:00 a.m.	Poster Take-Down	Exhibit Hall 1
10:45 a.m. – 12:00 p.m.	General Session with Speaker Jeff Hurt, “Making The Science Of Plant Pathology Work For You: What Now? What’s Next?”	Lila Cockrell Theatre, CC
	<i>(live-streamed session)</i>	
10:45 a.m. – 12:30 p.m.	Exhibit Take-Down	Exhibit Hall 1
12:00 – 1:00 p.m.	Lunch Break	
12:00 – 3:00 p.m.	APS Council Meeting	Travis CD, Hyatt
1:00 – 2:15 p.m.	Scientific Sessions	
	SPECIAL SESSION: Labs, A Mechanism to Enhance Learning in the Changing World of Plant Pathology	221B, CC
	TECHNICAL SESSION: Floral and Fruit Diseases	221C, CC
	TECHNICAL SESSION: Virology Detection and Descriptions	225B, CC
1:00 – 4:00 p.m.	Scientific Sessions	
	SPECIAL SESSION: Adapt, Change, and Improvise: How to Control Diseases as the Climate Is Changing <i>(live-streamed session)</i>	221D, CC
	SPECIAL SESSION: New Insights into NLR on Plant Immunity: Pathogen Recognitions, Molecular Interactions, and Novel Disease Control Strategies	221A, CC
2:00 – 4:00 p.m.	Office of Public Relations & Outreach (OPRO) Board Meeting	Travis A, Hyatt
2:45 – 4:00 p.m.	Scientific Sessions	
	SPECIAL SESSION: An Ever-Changing Extension Environment: Keeping a Foot in the Furrow and a Hand in Cyberspace	221B, CC
	TECHNICAL SESSION: Chemical Control	221C, CC
	TECHNICAL SESSION: Mycotoxins	225B, CC
7:00 – 9:30 p.m.	Final Night Celebration—The Last Alamo Revelry	The Grotto, CC

New! For committee leaders, committee members, and anyone interested!

Committees: How to Be Effective Session

9:30 – 10:30 a.m.; 221A, Convention Center

Organizers and Presenters: Lindsey J. du Toit, Washington State University Mount Vernon NWREC, Mount Vernon, WA; Paul Vincelli, University of Kentucky, Lexington, KY

Looking for new ways to get the most out of serving on an APS committee? Through a combination of open discussion and informal presentation, this session will assist in facilitating highly effective committees. Selected, short resources will be provided.

Field Trips

Ornamental

7:30 a.m. – 5:00 p.m.

Organizers: S. C. Rhodes, Kevin Ong, Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.; Ann Chase, Chase Agricultural Consulting, Cottonwood, AZ, U.S.A.; Fulya Bay-sal-Gurel, Tennessee State University, McMinnville, TN, U.S.A.

Sponsoring Committee: Disease of Ornamental Plants Committee, Extension Committee

Financial Sponsor: Chase Agricultural Consulting LLC

Participants on the ornamental field trip will be visiting a range of ornamental productions and get to see how these plants are used in a public setting. Tour participants will have the opportunity to visit Mortellaro's Nursery, a wholesale nursery specializing in woody and native ornamental production, and Color Spot San Antonio, a wholesale nursery specializing in everything from small color annuals to very large woody ornamentals, including many colorful and unique plants used in the southern landscape across the country. Since Color Spot starts many of their own plants, a visit to the propagation area will be included. Another stop on the tour is San Antonio Botanical Gardens. This 38-acre garden is a top San Antonio attraction that serves as a museum of plants, as well as a research and conservation facility that provides a beautiful and engaging environment. From the Rose Garden to the tropical selections in the exhibit rooms of the Conservatory to the Texas Native Trail, there's always something new to see at this Texas-style Botanical Garden. *Fee includes transportation, lunch, and all admissions. Preregistration required.*

Workshops

(listed in alphabetical order)

The Current State of Introductory Plant Pathology Courses: What We Learned and How You Can Improve Your Own Course

2:00 – 5:00 p.m.; Republic B, Hyatt

Organizers: Maya C. Hayslett, University of Wisconsin, Madison, WI, U.S.A.; Brantlee Spakes Richter, University of Florida, Gainesville, FL, U.S.A.; Anissa M. Poleatewich, University of New Hampshire, Durham, NH, U.S.A.

Sponsoring Committee: Teaching Committee

Financial Sponsor: NIFA

The APS Teaching Committee recently completed a research project to investigate the state of introductory plant pathology curricula nationwide, their alignment with industry needs, and their uses of best practices for learning. This workshop is for instructors of plant pathology courses to discuss in an interactive forum the key findings of the study. What are the core concepts and skills that should be taught in an introductory plant pathology course? What do employers expect of students who have completed an introductory plant pathology course? This workshop brings instructors together with industry representatives to directly discuss the needs and challenges in aligning course content to employer expectations. Attendees will spend time in

working groups to plan modifications to their courses (content, structure, delivery, pedagogy) based on the recommendations of the study.

Design Matters! Experimental Design in Lab, Greenhouse, and Field Settings

1:00 – 5:00 p.m.; Bonham D, Hyatt

Organizers: Alissa B. Kriss, Syngenta, Greensboro, NC, U.S.A.; Mizuho Nita, Virginia Tech, Winchester, VA, U.S.A.

Sponsoring Committee: Epidemiology Committee

This workshop will be geared to anyone who has not previously learned about designs (graduate students) or those who would like a refresher course. Registrants will learn the basics of experimental designs that are typically used in greenhouse-, lab-, and field-based plant pathology, why one would choose to use a certain design for their study, and how to evaluate prior to doing the study whether a good choice was made. We will link experimental design and study planning with the analysis of observed data and interpretation of statistical results through several examples given during the workshop and also provide the registrant opportunities for deeper study post-workshop. Code will be provided in SAS and it is recommended (but not required) that registrants have SAS on their computers. No prior in-depth statistics or programming skills will be needed.

Fact Finders for Agriculture – Hands-on Workshop for Use of USDA National Agricultural Statistics Service (NASS) Databases

1:00 – 5:00 p.m.; Bonham C, Hyatt

Organizers: N. Beth Carroll, Greensboro, NC, U.S.A.; Shiela Corley, USDA National Agricultural Statistics Service, Washington, DC, U.S.A.

When agricultural statistics make the headlines, the focus is usually on the latest statistics that help to minimize the uncertainties and risks associated with the production and marketing of commodities. NASS reports are often used directly and indirectly by farmers, producer organizations, agribusinesses, researchers, policymakers, and government agencies. This training will also be used to enhance the understanding of the phytobiome and in continuing APS's commitment to enabling sustainability of agricultural production. This workshop will provide training on the NASS Survey Programs, Quickstats use demonstrations, and a new, guided interface to Quickstats 2.0. Experts from NASS will provide understanding and skills to help users get commonly requested statistics from the online database. Workshop participants may submit specific questions to be addressed by the NASS experts during the training. These questions can cover virtually every U.S. agriculture, including production and supplies of food, feed, and fiber; pricing; chemical use; demographic data; and much more.

Meta-Analysis for Combining Results from Multiple Studies in Plant Pathology

10:00 a.m. – 5:00 p.m.; 301B, Convention Center

Organizers: Laurence V. Madden, Pierce Paul, Ohio State University, Wooster, OH, U.S.A.

Sponsoring Committee: Epidemiology Committee

Meta-analysis is the analysis of results of multiple independent studies, which is performed in order to synthesize the evidence from many possible sources in a formal quantitative manner. In the most common case, the outcome of each study becomes a single observation in the meta-analysis of all available studies. The discipline developed originally in the social sciences in the 1970s and has now been embraced within many scientific disciplines. This workshop will cover basic concepts and approaches in meta-analysis and show how to estimate parameters and interpret results. Methods for expanding the meta-analytical model to account for study-level characteristics (so called moderator variables) and for multiple treatments per study will be reviewed. Methods will be explained primarily using SAS software and also with R.

Morphological ID of Phytopathogenic Fungi

9:00 a.m. – 4:00 p.m.; Bonham E, Hyatt

Organizers: Lindsey D. Thiessen, North Carolina State University, Raleigh, NC, U.S.A.; Megan K. Romberg, USDA APHIS PPQ NIS, Beltsville, MD, U.S.A.

Sponsoring Committee: Mycology Committee

While molecular techniques can help clarify relationships between fungi and provide for diagnostics of cryptic species or nonsporulating fungi, these techniques may not be rapid enough for diagnosticians or extension specialists to quickly and efficiently diagnose disease in the clinic or in the field. In addition, the lack of sequences for many fungi in public databases means that, even if molecular techniques can be employed, the identity of a fungus may still elude the diagnostician. This workshop is geared toward improving the skills of plant pathologists in morphological identification of fungi. Morphological identification of several groups of fungi, including tips for sample preparation, will be addressed as well as important events in fungal taxonomy and nomenclature.

Population Genomics in R

8:00 – 11:30 a.m.; 301A, Convention Center

Organizer: Niklaus Grunwald, USDA ARS, Corvallis, OR, U.S.A.

Sponsoring Committee: Evolutionary Genetics and Genomics Committee

Analysis of population genetic data remains challenging, particularly in the genomics era. High-throughput sequencing has resulted in the opportunity to sequence variants (SNPs, indels, etc.) at the genome scale. However, application of these technologies for the characterization of pathogens provides unique challenges. This workshop will focus on the kinds of analyses typically conducted by plant pathologists. It will cover analyses of data from tools such as whole-genome variant calling and genotyping-by-sequencing or RADseq once variant call data are in hand. This workshop will not cover genome assembly, read mapping to reference genomes, or the calling of variants. This workshop will focus on the processing and filtering of variants obtained by tools such as TASSEL, SAMtools, or GATK. Participants will gain hands-on experience with analysis of variant calling format (VCF) data in R using datasets provided by instructors. We will use R packages such as adegenet, poppr, and vcfR. Basic familiarity with R is required.

Principles of Diagnostic Assay Validation

8:00 a.m. – 5:00 p.m.; 303A, Convention Center

Organizers: Kitty F. Cardwell, Oklahoma State University, Stillwater, OK, U.S.A.; James P. Stack, Kansas State University, Manhattan, KS, U.S.A.; Laurene Levy, USDA APHIS PPQ CPHST, Riverdale, MD, U.S.A.; Arif Mohammad, Kansas State University, Manhattan, KS, U.S.A.; Carla D. Garzon, Oklahoma State University, Stillwater, OK, U.S.A.; Jacqueline Fletcher, Oklahoma State University, Stillwater, OK, U.S.A.

Sponsoring Committee/Sponsor: Forensic Microbiology Interest Group, Plant Pathogen and Disease Detection Committee, Diagnostics Committee, Emerging Diseases Committee

Financial Sponsors: Agdia; PathSensors, Inc.

This is a one-day workshop to develop a conceptual framework to discuss and define the principles of diagnostic assay validation. The vocabulary of assay validation is only loosely understood in our discipline. Specifications of confidence, defined by metrics of specificity, inclusivity, sensitivity, and exclusivity, and then robustness of an assay in the hands of multiple users are not standardized. We propose to look at confidence across a range of stringency requirements; bioforensic analysis by law enforcement; discriminatory analyses for regulators and PPQ; and diagnostic tools used by NPDN and industry clinics for local sample triage and assessment. Expected Outcomes: (1) The diagnostic community and assay developers will have a common understanding of the language and metrics of validation. (2) A framework for discussion about validation protocols will be proposed in advance of a 2018 international symposium on assay validation standards. (3) A position paper will be developed and published that will provide a potential framework for review of APS journal articles on diagnostic assay development.

SUNDAY AFTERNOON, AUGUST 6

All Scientific Sessions take place in the CONVENTION CENTER.

Special Sessions listed first, followed by Oral Technical Sessions. Listed alphabetical by session title. Find complete details on the meeting website apsnet.org/meet. As a courtesy to presenters, please DO NOT TAKE PHOTOS during their presentation or of the slide content without presenter approval. Session content listed in the program is as submitted by the authors/presenter and has NOT been edited.

Special Sessions

Beautiful Efficiency: The Multifunctional Nature of Virus Proteins

1:00 – 4:00 p.m. • Room 221A, Convention Center

Organizers: Richard S. Nelson, Samuel Roberts Noble Foundation, Inc., Ardmore, OK, U.S.A.; Carl M. Deom, University of Georgia, Athens, GA, U.S.A.

Moderators: Carl M. Deom, University of Georgia, Athens, GA, U.S.A.; Richard S. Nelson, Samuel Roberts Noble Foundation, Inc., Ardmore, OK, U.S.A.

Section: Molecular and Cellular Plant-Microbe Interactions

Sponsoring Committee: Virology Committee

Financial Sponsor: The Noble Research Institute, LLC; APS/APHIS Widely Prevalent Virus Committee

1:00 p.m. • 1-S

The P6 Effector Protein of Cauliflower mosaic virus: A Masterswitch in the Virus Infection Cycle
J. SCHOELZ (1), M. Adhab (2), C. A. Angel (3), R. S. Nelson (4), (1) University of Missouri, Columbia, MO, U.S.A.; (2) University of Missouri - Columbia, Columbia, MO, U.S.A.; (3) Cenicafe - Colombia, Manizales, COLOMBIA; (4) Samuel Roberts Noble Foundation, Inc., Ardmore, OK, U.S.A.

1:30 p.m. • 2-S

The tobamovirus 126-kDa protein: A multifunctional, multi-interacting, and evolving protein that influences disease
R. S. NELSON (1), A. Ibrahim (1), K. Cooper (1), J. E. Schoelz (2), (1) Samuel Roberts Noble Foundation, Inc., Ardmore, OK, U.S.A.; (2) University of Missouri, Columbia, MO, U.S.A.

2:00 p.m. • 3-S

The p33 protein of Citrus tristeza virus: A conundrum of multiple functions
S. Y. FOLIMONOVA, University of Florida, Gainesville, FL, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 4-S

Functional variation in cognate proteins of nucleotrophic negative-strand RNA viruses of plants
M. M. GOODIN, University of Kentucky, Lexington, KY, U.S.A.

3:15 p.m. • 5-S

Dissecting the mechanism of Potato virus X insertion into plasmodesmata
Y. Lu (1), D. Burnett (1), M. Zabradý (2), J. TILSNER (1,3), (1) James Hutton Institute, Dundee, UNITED KINGDOM; (2)

University of St Andrews, St Andrews, UNITED KINGDOM; (3) University of St. Andrews, St. Andrews, UNITED KINGDOM

3:45 p.m. • 6-S

Geminivirus C4 proteins: Divergent functions
C. M. DEOM, University of Georgia, Athens, GA, U.S.A.

Schroth – Faces of the Future Session: Host Resistance and Host Pathogens Interactions

1:00 – 4:00 p.m. • Room 225A, Convention Center

Organizer and Moderator: Martha M. Malapi-Wight, USDA-APHIS, Beltsville, MD, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committee: Early Career Professionals Committee

Financial Sponsor: APS Foundation

1:00 p.m. • 7-S

Lose the effector or die tryin': Novel quantitative resistance loci for bacterial blight
A. I. HUERTA (1), E. Delorean (1), A. Bossa-Castro (1), C. Raghavan (2), R. Corral (1), V. M. Verdier (3), H. Leung (4), J. E. Leach (1), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) International Rice Research Institute, Metro Manila 1301, PHILIPPINES; (3) IRD, Cirad, Univ Montpellier, IPME, Montpellier, FRANCE; (4) Intl Rice Research Inst, Metro Manila, PHILIPPINES

1:30 p.m. • 8-S

How Does Plant Immunity Restrict Bacterial virulence?
B. KVITKO, A. Lovelace, University of Georgia, Athens, GA, U.S.A.

2:00 p.m. • Break

2:15 p.m. • 9-S

Managing Phomopsis stem canker of sunflower using host resistance
F. M. MATHEW (1), T. Olson (1), L. Marek (2), (1) South Dakota State University, Brookings, SD, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.

2:45 p.m. • 10-S

Evolving Phenolic Roles in Host Defense: The Cases of 'Candidatus Liberibacter solanacearum' Potato Infections and that of Grapevine Pathogens
C. M. WALLIS (1), S. A. Lee (1), E. E. Rogers (2), E. R. Galarneau (3), K. Baumgartner (4), (1) USDA ARS, Parlier, CA, U.S.A.; (2) USDA ARS FDWSRU, Fort Detrick, MD, U.S.A.; (3) University of California Davis, Davis, CA, U.S.A.; (4) USDA ARS, Davis, CA, U.S.A.

Show Me the Money! Assessing the Value of Disease Control in a Changing Landscape

1:00 – 4:00 p.m. • Room 221D, Convention Center (live-streamed session)

Organizers: Kelsey F. Andersen, Plant Pathology Department, Gainesville, FL, U.S.A.; Robin Choudhury, University of Florida Plant Pathology Department, Gainesville, FL, U.S.A.

Moderators: Robin Choudhury, University of Florida Plant Pathology Department, Gainesville, FL, U.S.A.; Kelsey F. Andersen, Plant Pathology Department, Gainesville, FL, U.S.A. **Section:** Epidemiology

Sponsoring Committee: Crop Loss Assessment and Risk Evaluation Committee, Epidemiology Committee

Financial Sponsor: Monsanto

1:00 p.m. • 11-S

Losses, regrets and expectations: an overview of attaching value to disease management decisions

N. MCROBERTS, University of California-Davis, Davis, CA, U.S.A.

1:15 p.m. • 12-S

Risk analysis and economic optimization of late blight management tactics

I. M. SMALL (1), Y. Liu (2), M. Langemeier (3), L. Joseph (4), W. E. Fry (4), (1) University of Florida, Quincy, FL, U.S.A.; (2) Dept. of Agriculture, Eastern Kentucky University, Richmond, KY, U.S.A.; (3) Dept. of Ag. Economics, Purdue University, West Lafayette, IN, U.S.A.; (4) Cornell University, Ithaca, NY, U.S.A.

1:30 p.m. • 13-S

Networked real time disease risk evaluation: a cost-effective approach to disease management

O. CARISSE (1), H. Van Der Heyden (2), (1) Agric & Agri-Food Canada, Saint-Jean-sur-Richelieu, QC, CANADA; (2) Compagnie de recherche Phytodata, Sherrington, QC, CANADA

2:00 p.m. • Break

2:15 p.m. • 14-S

Cost-benefit analysis of integrated management strategies for FUSarium head blight of wheat

P. A. PAUL, J. Salgado, L. V. Madden, Ohio State Univ, Ohio Agricultural Research and Development Center, Dept of Plant Pathology, Wooster, OH, U.S.A.

2:45 p.m. • 15-S

Impact Network Analysis: A framework for evaluating the effects of technologies through linked socioeconomic and biophysical networks

K. A. GARRETT, University of Florida Plant Pathology Department, Gainesville, FL, U.S.A.

3:15 p.m. • 16-S

Disease Control: A Seed Company Perspective

J. W. PITKIN PHD, Monsanto, Chesterfield, MO, U.S.A.

Unfriendly and Beneficial Plant-Parasite Interactions

1:00 – 4:00 p.m. • Room 225C, Convention Center

Organizers: You-Liang Peng, China Agri. Univ., Beijing, CHINA; Guo-Liang Wang, The Ohio State University, Columbus, OH, U.S.A.; Yulin Jia, USDA ARS, Dale Bumpers National Rice Research Center, Stuttgart, AR, U.S.A.

Moderators: Yulin Jia, USDA ARS, Dale Bumpers National Rice Research Center, Stuttgart, AR, U.S.A.; You-Liang Peng, China Agri. Univ., Beijing, CHINA

Section: Molecular and Cellular Plant-Microbe Interactions

Sponsoring Committee/Sponsor: APS-CSPP Working Group, Host Resistant Committee

1:00 p.m. • 17-S

Understanding effector biology and biotrophic strategies used by the ascomycete fungus *Magnaporthe (Pyricularia) oryzae* to cause the devastating rice blast disease.

B. S. VALENT, Kansas State University, Manhattan, KS, U.S.A.

1:30 p.m. • 18-S

PacC-dependent differential regulation of nutrition-associated genes for adaptation to alkalinized host cells by *Magnaporthe oryzae*

Y. L. PENG, China Agri. Univ., Beijing, CHINA

2:00 p.m. • 19-S

The role of barberry in virulence variation and epidemics of wheat stripe rust in China

Z. KANG, J. Zhao, Y. Tian, Y. Zhao, Q. Li, G. Zhan, L. Huang, Northwest A&F University, Yangling, Shaanxi, CHINA

2:30 p.m. • Break

2:45 p.m. • 20-S

Influence of root exudates and soil on attachment of *Pasteuria* penetrans to root-knot nematode *Meloidogyne arenaria*.

C. LIU (1), P. Timper (2), P. Ji (1), (1) University of Georgia, Tifton, GA, U.S.A.; (2) USDA ARS, Tifton, GA, U.S.A.

3:00 p.m. • 21-S

Role of Plant Innate Immunity in the Legume, Nitrogen Fixing Symbiosis

G. STACEY, University of Missouri, Columbia, MO, U.S.A.

3:30 p.m. • 22-S

Exploring fungal DNA virus to control stem rot of oilseed rape caused by *Sclerotinia sclerotiorum*

H. Zhang (1), Z. Qu (1), S. Liu (1), J. Xie (1), J. Cheng (1), B. Li (2), T. Chen (2), Y. Fu (2), G. Li (1), D. JIANG (1), (1) State Key Laboratory of Agricultural Microbiology, Huazhong Agricultural University, Wuhan, CHINA; (2) College of Plant Science and Technology, Huazhong Agricultural University, Wuhan, CHINA

1:00 p.m. Technical Sessions

Genetics of Resistance and Virulence

1:00 – 2:15 p.m. • Room 221C, Convention Center

Moderators: Jonathan Richards, North Dakota State University, Fargo, ND, U.S.A.; Ashish Ranjan PhD, University of Wisconsin Madison, Madison, WI, U.S.A.

1:00 p.m. • 1-O

Genetics, genomics, and transcriptomics reveal candidate avirulence/virulence effectors in *Pyrenophora teres* f. *teres*
J. RICHARDS (1), V. Koladia (1), R. S. Brueggeman (1), T. L. Friesen (2), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) USDA ARS, Fargo, ND, U.S.A.

1:15 p.m. • 2-O

Volatiles from LOX10 promote maize susceptibility to *Colletotrichum graminicola* by hijacking jasmonic and salicylic acids antagonism

Z. GORMAN (1), S. Christensen (2), Y. He (1), Y. Yan (3), E. J. Borrego (1), M. V. Kolomiets (1), (1) Texas A&M University, College Station, TX, U.S.A.; (2) Chemistry Unit, Center of Medical, Agricultural, and Veterinary Entomology, USDA, Gainesville, TX, U.S.A.; (3) Nanjing Agricultural University, Nanjing, CHINA

1:30 p.m. • 3-O

Resistance to *Sclerotinia sclerotiorum* in soybean deciphered by transcriptome and metabolome analyses

A. RANJAN PHD (1), D. L. Smith (2), M. Kabbage (2), (1) University of Wisconsin Madison, Madison, WI, U.S.A.; (2) University of Wisconsin, Madison, WI, U.S.A.

1:45 p.m. • 4-O

Identifying functions of effectors and small RNAs involved in wheat-rust interactions

S. R. RAMACHANDRAN (1), C. Yin (1), N. A. Mueth (2), K. Tanaka (3), S. H. Hulbert (1), (1) Dept. of Plant Pathology, Washington State University, Pullman, WA, U.S.A.; (2) Washington State University, Pullman, WA, U.S.A.; (3) Department of Plant Pathology, Washington State University, Pullman, WA, U.S.A.

2:00 p.m. • 5-O

Dissection of the APIP6-mediated ubiquitin-proteasome pathway in rice immunity against *Magnaporthe oryzae*

Y. NING (1), G. L. Wang (1,2), (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, CHINA; (2) The Ohio State University, Columbus, OH, U.S.A.

Pathogen Detection and Diversity

1:00 – 2:15 p.m. • Room 225B, Convention Center

Moderators: Jerry E. Weiland, USDA ARS, Corvallis, OR, U.S.A.; Adrienne M. Gorny, Cornell University, Plant Pathology & Plant Microbe Biology Section, Geneva, NY, U.S.A.

1:00 p.m. • 6-O

A performance-based approach to the detection of Acidovorax citrulli in cucurbit seed samples

K. D. KLEINHESSELINK, Monsanto, Woodland, CA, U.S.A.

1:15 p.m. • 7-O

A comparative study of three detection techniques for *Leifsonia xyli*

subsp. *xyli*, the caU.S.A.l pathogen of sugarcane ratoon stunting disease

Q. WU (1), Y. B. Pan (2), L. Xu (1), D. Zhou (1), M. P. Grisham (2), Y. Su (1), J. Guo (1), Y. Que (1), (1) Fujian Agriculture and Forestry University, Fuzhou, CHINA; (2) USDA-ARS, SRU, Houma, LA, U.S.A.

1:30 p.m. • 8-O

Expanding the scope of a single pathogen survey to solve the mystery of the ailing red raspberries

J. E. WEILAND (1), C. Benedict (2), I. A. Zasada (1), B. Beck (1), A. Davis (1), A. Peetz (3), K. Graham (1), R. R. Martin (1), J. K. S. Dung PhD (4), A. J. Reyes Gaige (5), L. D. Thiessen (6), (1) USDA ARS, Corvallis, OR, U.S.A.; (2) WSU, Bellingham, WA, U.S.A.; (3) USDA ARS HCRU, Corvallis, OR, U.S.A.; (4) Oregon State University, Madras, OR, U.S.A.; (5) Oregon State University, Corvallis, OR, U.S.A.; (6) North Carolina State University, Raleigh, NC, U.S.A.

1:45 p.m. • 9-O

Rapid diagnostic tools for soilborne pathogens of strawberry
A. BURKHARDT (1), M. Ramon (1), S. T. Koike (2), F. N. Martin (1), (1) USDA ARS, Salinas, CA, U.S.A.; (2) Univ of California, Salinas, CA, U.S.A.

2:00 p.m. • 10-O

Extracting Genomic DNA from Root-Knot Nematode Infested Soil using Fe₃O₄ Super Paramagnetic Nanoparticles

A. M. GORNY (1), X. Wang (2,3), S. J. Pethybridge (1), (1) Cornell University, Plant Pathology & Plant Microbe Biology Section, Geneva, NY, U.S.A.; (2) USDA-ARS, Robert W. Holley Center for Agriculture and Health, Ithaca, NY, U.S.A.; (3) Cornell University, School of Integrative Plant Science, Ithaca, NY, U.S.A.

2:45 p.m. PhytoView

Seedborne vs. Seed Transmitted Plant Pathogens: The Curious Case of *Phomopsis* spp. on Spinach Seed • ICPP2018 Preview Topic

2:45 – 4:00 p.m., Room 221B, Convention Center

Organizer: Ron Walcott, The University of Georgia, Athens, GA
Presenters:

- Lindsey du Toit, WSU Mount Vernon Northwestern Washington Research & Extension Center (NWREC), Mount Vernon, WA
- Ric Dunkle, American Seed Trade Association, Alexandria, VA
- Christina Devorshak, USDA/APHIS – PPQ, CPHST, Raleigh, NC

2:45 p.m. Technical Sessions

Integrated Pest Management

2:45 – 4:00 p.m. • Room 221C, Convention Center

Moderators: Anna L. Testen, The Ohio State University OARDC, Wooster, OH, U.S.A.; David M. Gadoury, Cornell University, Geneva, NY, U.S.A.

2:45 p.m. • 11-O

Anaerobic soil disinfestation to manage soilborne disease complexes in protected culture tomato production

A. L. TESTEN, S. A. Miller, The Ohio State University OARDC, Wooster, OH, U.S.A.

3:00 p.m. • 12-O

Effect of tillage and cultivar on sudden death syndrome and yield of soybean in Iowa

Y. R. KANDEL, L. F. S. Leandro, D. S. Mueller, Iowa State University, Ames, IA, U.S.A.

3:15 p.m. • 13-O

Design and operational considerations for use of UV and red light for suppression of plant diseases under field conditions

D. M. GADOURY (1), A. Bierman (2), M. Rea (2), A. Stensvand (3), A. Suthaparan (4), R. Borba Onofre (5), (1) Cornell University, Geneva, NY, U.S.A.; (2) Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, U.S.A.; (3) Norwegian Institute of Bioeconomy Research, Ås, NORWAY; (4) Norwegian University of Life Sciences, Ås, NORWAY; (5) University of Florida - Gulf Coast Research and Education Center, Wimauma, FL, U.S.A.

3:30 p.m. • 14-O

A Multi-state Coordinated Project to Evaluate Integrated Management Strategies for F.U.S.A.rium Head Blight and Deoxynivalenol in Wheat

J. D. SALGADO (1), P. A. Paul (2), K. A. Ames (3), G. C. Bergstrom (4), C. A. Bradley PhD (5), E. Z. Byamukama (6), J. A. Cummings (7), V. Chapara (8), M. Chilvers (9), R. Dill-Macky (10), A. J. Friskop (11), P. Gautam (12), N. M. Kleczewski (13), L. V. Madden (2), E. A. Milus (14), M. Nagelkirk (15), J. Ransom (16), K. R. Ruden (17), J. Stevens (18), S. N. Wegulo (19), K. A. Wise (20), D. Yabwalo (21), (1) The Ohio State University, Wooster, OH, U.S.A.; (2) Ohio State Univ, Ohio Agricultural Research and Development Center, Dept of Plant Pathology, Wooster, OH, U.S.A.; (3) University of Illinois, Urbana, IL, U.S.A.; (4) Cornell Univ, Ithaca, NY, U.S.A.; (5) University of Kentucky, Princeton, KY, U.S.A.; (6) South Dakota State Univ, Brookings, SD, U.S.A.; (7) Cornell University, Trumansburg, NY, U.S.A.; (8) NDSU, Langdon, ND, U.S.A.; (9) Michigan State University, East Lansing, MI, U.S.A.; (10) University of Minnesota, St Paul, MN, U.S.A.; (11) Department of Plant Pathology, North Dakota State University, Fargo, ND, U.S.A.; (12) Bayer CropScience, Beaver Crossing, NE, U.S.A.; (13) University of Delaware, Newark, DE, U.S.A.; (14) University of Arkansas, Salida, CO, U.S.A.; (15) Michigan State Univ Ext, Sandusky, MI, U.S.A.; (16) North Dakota State University, Fargo, ND, U.S.A.; (17) Bayer Crop Science, Bruce, SD, U.S.A.; (18) University of Nebraska, Lincoln, NE, U.S.A.; (19) Univ of Nebraska, Lincoln, NE, U.S.A.; (20) Purdue University, West Lafayette, IN, U.S.A.; (21) South Dakota State University, Brookings, SD, U.S.A.

3:45 p.m. • 15-O

Assessment and utilization of risk factors in predicting the development of soybean sudden death syndrome

M. ROTH, Z. Noel, J. Wang, A. Byrne, M. Chilvers, Michigan State University, East Lansing, MI, U.S.A.

Root Phytobiome

2:45 – 4:00 p.m. • Room 225B, Convention Center

Moderators: Ryan Blaustein, University of Florida, Gainesville, FL, U.S.A.; Ali Y. Srou, Southern Illinois Univ, Carbondale, IL, U.S.A.

2:45 p.m. • 16-O

A model bacterial community of maize roots

B. NIU (1), J. Paulson (2,3), X. Zheng (2,4), R. Kolter (1), (1) Department of Microbiology and Immunobiology, Harvard Medical School, Boston, MA, U.S.A.; (2) Department of Biostatistics and Computational Biology, Dana-Farber Cancer Institute, Boston, MA, U.S.A.; (3) Department of Biostatistics, Harvard T. H. Chan School of Public Health, Boston, MA, U.S.A.; (4) Department of Mathematics, Shanghai Normal University, Shanghai, CHINA

3:00 p.m. • 17-O

Functional diversity of citrus microbiomes correlates with Huanglongbing disease symptom severity

R. BLAUSTEIN, J. Silfa-Cifuentes, G. Lorca, M. Teplitski, University of Florida, Gainesville, FL, U.S.A.

3:15 p.m. • 18-O

The effects of cultivar, production system, and nursery on the composition of the rhizosphere microbiome of cultivated rhododendrons in Oregon

Z. FOSTER (1,2), J. E. Weiland (1), C. Scagel (1), N. Grunwald (1), (1) USDA ARS, Corvallis, OR, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.

3:30 p.m. • 19-O

Impact of Long-Term Tillage and Fertility Treatments on Soil Microbial Communities

A. Y. SROUR (1), J. Hackman (2), R. Cook (3), J. P. Bond (4), A. M. Fakhoury (4), (1) Southern Illinois Univ, Carbondale, IL, U.S.A.; (2) Southern Illinois University Carbondale, Carbondale, IL, U.S.A.; (3) North Carolina State University, Raleigh, NC, U.S.A.; (4) Southern Illinois University, Carbondale, IL, U.S.A.

3:45 p.m. • 20-O

Effect of Copper Nanomaterials on the Soil Microbiome

A. L. STRAYER (1), J. C. Hong (2), Y. Y. Liao (1), M. Young (3), S. Santra (4), E. N. Roskopf (2), S. Timilsina (5), G. E. Vallad (1,6), J. B. Jones (5), M. Paret (1,7), (1) University of Florida, Department of Plant Pathology, Gainesville, FL, U.S.A.; (2) USDA ARS, United States Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.; (3) NanoScience Technology Center and Burnett School of Biomedical Science, UCF, Orlando, FL, U.S.A.; (4) University of Central Florida, Orlando, FL, U.S.A.; (5) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (6) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, U.S.A.; (7) North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.

MONDAY MORNING, AUGUST 7

All Scientific Sessions take place in the CONVENTION CENTER.

Special Sessions listed first, followed by Oral Technical Sessions. Listed alphabetical by session title.

Find complete details on the meeting website apsnet.org/meet.

As a courtesy to presenters, please DO NOT TAKE PHOTOS during their presentation or of the slide content without presenter approval.

Session content listed in the program is as submitted by the authors/presenter and has NOT been edited.

Hot Topic

Highs and Lows of Cannabis Pathology

8:00 – 9:15 a.m. • Room 221A, Convention Center

Organizer: Janna Beckerman, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN

It's definitely a hot topic. Get the latest information about diseases of Cannabis as well as the challenges associated with serving this growing industry.

- Regulatory and Legal Issues in Identifying Pests on Cannabis - Mitchell Yergert, Colorado Department of Agriculture, U.S.A.
- Hemp Disease Risks, Myths, and Blurred Lines - Nicole W. Gauthier, Extension Pathology, University of Kentucky, Lexington, KY, U.S.A.
- Industrial Hemp: The Inside Dope - Janna Beckerman, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN, U.S.A.

Special Sessions

Best Practices in Diagnostic Test Development and Deployment

8:00 – 9:15 a.m. • Room 221D, Convention Center

Organizers: Kevin Ong, Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.; Scott A. Heuchelin, DuPont Pioneer, Johnston, IA, U.S.A.

Moderator: Scott A. Heuchelin, DuPont Pioneer, Johnston, IA, U.S.A.

Section: Diseases of Plants

Sponsoring Committees: Diagnostics Committee, Plant Protection and Disease Detection Committee, Seed Pathology Committee, Diseases of Ornamental Plants Committee, Evolutionary Genetics and Genomics Committee, Epidemiology Committee

8:00 a.m. • 23-S

The need for accurate repeatable diagnostic assays and the pitfalls of testing anomalies: Case study examples from the seed industry
S. A. HEUCHELIN, DuPont Pioneer, Johnston, IA, U.S.A.

8:10 a.m. • 24-S

International validation and harmonization efforts for seed health testing
C. C. BLOCK, G. P. Munkvold, T. Bruns, Iowa State University, Ames, IA, U.S.A.

8:25 a.m. • 25-S

Obtaining DNA template of adequate purity for amplification and avoiding compounds present that inhibit amplification: A *Verticillium dahliae* example
G. J. BILODEAU, Canadian Food Inspection Agency, Ottawa, ON, CANADA

8:40 a.m. • 26-S

Transferring PCR assays into isothermal platforms: How to make sure it works in real world settings.
T. MILES, California State University-Monterey Bay, Seaside, CA, U.S.A.

8:55 a.m. • 27-S

USDA APHIS NPPLAP Proficiency Testing and planned methods deviation as a part of the methods' validation process for a network of laboratories
V. A. MAVRODIEVA (1), G. Dennis (2), P. J. Shiel (3), (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, U.S.A.; (2) USDA-APHIS-PPQ-S&T-CPHST, Raleigh, NC, U.S.A.; (3) USDA APHIS PPQ CPHST, Raleigh, NC, U.S.A.

New Products and Services, Part I

8:00 – 9:30 a.m. • Room 221B, Convention Center

Organizer and Moderator: Neil Glynn, Syngenta, Vero Beach, FL, U.S.A.

Section: Plant Disease Management

Sponsoring Committee: Industry Committee

8:00 a.m.

Bixafen – a New SDHI Fungicide for Use in North American Agriculture; M. LONG, FMC Corporation, Philadelphia, Pennsylvania, U.S.A.

8:15 a.m.

The Miravis® Brand Family of Fungicides; K. BUXTON, Syngenta, Vero Beach, Florida, U.S.A.

8:30 a.m.

Exteris Stressgard Fungicide; R. RIOUX, Bayer Crop Science, Durham, North Carolina, U.S.A.

8:45 a.m.

Dow New Fungicide Fenpicoxamid; C. YAO, Dow AgroSciences LLC, Indianapolis, Indiana, U.S.A.

9:00 a.m.

MBI-110 and MBI-601 for Above and Below Ground Disease Management; T. JOHNSON, Marrone Bio Innovations, Davis, California

9:15 a.m.

POWER PLUS; V. THIMAKAPURA, Green Lifescience Technologies Pvt. Ltd., Vijayanagara, Mysore, KARNATAKA, INDIA

Phytobiomes 2.0: Functional Approaches in Forest Ecosystems

• ICPP2018 Preview Topic

8:00 – 9:15 a.m. • Room 225A, Convention Center

Organizers: Caterina Villari, D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA, U.S.A.; Denita Hadziabdic, University of Tennessee, Knoxville, TN, U.S.A.

Moderators: Caterina Villari, D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA, U.S.A.; Jane Stewart, Colorado State University, Fort Collins, CO, U.S.A.

Section: Molecular and Cellular Plant-Microbe Interactions

Sponsoring Committee: Forest Pathology Committee

8:00 a.m. • 28-S

Metagenomic approaches to examine relationships of soil microbial communities with *Armillaria* root disease
J. STEWART (1), B. Lalande (1), Z. Abdo (1), J. Hanna (2), D. Page-Dumroese (2), M. Warwell (2), J. Tirocke (2), M. S. Kim (3), N. B. Klopfenstein (2), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) Rocky Mountain Research Station, USDA Forest Service, Moscow, ID, U.S.A.; (3) Kookmin University, Seoul, Korea, Republic of (South)

8:15 a.m. • 29-S

Movement of bacteria between plant species drive assembly of epiphytic bacterial communities
S. LINDOW, University of California Berkeley, Berkeley, CA, U.S.A.

8:30 a.m. • 30-S

Microbial communities of bristlecone needles and resistance in white pine blister rust
A. ALBERTSON (1), Z. Abdo (1), A. W. Schoettle (2), J. Stewart (1), K. Kassenbrock (1), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) USDA Forest Service, Fort Collins, CO, U.S.A.

8:45 a.m. • 31-S

Role of leaf microbiome associated with European ash in mediating resistance to ash dieback
M. CLEARY, Swedish University of Agricultural Sciences, Alnarp, SWEDEN

9:00 a.m. • 32-S

The *Populus* microbiome: Progress and limitations of our understanding of phytobiome communities
D. JACOBSON (1,2), P. Jones (2), G. Tuskan (1), W. Muchero (1), J. Chen (1), (1) Oak Ridge National Laboratory, Oak Ridge, TN, U.S.A.; (2) University of Tennessee, Oak Ridge, TN, U.S.A.

Technical Sessions

Fungal Diseases

8:00 – 9:15 a.m. • Room 221C, Convention Center

Moderators: Pablo D. Olivera Firpo, University of Minnesota, St. Paul, MN, U.S.A.; Tyler McCann, Cornell University, Geneva, NY, U.S.A.

8:00 a.m. • 21-O

Emerging plant pathogens on ornamental crops in south Florida
G. SANAHUJA SOLSONA (1), P. Lopez (2), S. N. Suarez

(2), E. V. Campoverde (3), E. Evans (4), A. J. Palmateer (5), (1) Tropical REC, Homestead, FL, U.S.A.; (2) University of Florida, Homestead, FL, U.S.A.; (3) University of Florida Extension Miami-Dade, Homestead, FL, U.S.A.; (4) University of Florida - Tropical Research and Education Center, Homestead, FL, U.S.A.; (5) Bayer Environmental Science, Homestead, FL, U.S.A.

8:15 a.m. • 22-O

Detection of virulent races from international populations of *Puccinia graminis* f. sp. *tritici*
P. D. OLIVERA FIRPO (1), L. J. Szabo (2), D. Luster (3), Y. Jin (4), (1) University of Minnesota, St. Paul, MN, U.S.A.; (2) USDA ARS, St Paul, MN, U.S.A.; (3) USDA ARS FDWSRU, Fort Detrick, MD, U.S.A.; (4) USDA-ARS Cereal Disease Laboratory, Saint Paul, MN, U.S.A.

8:30 a.m. • 23-O

Endophytic fungi associated with *Populus* roots: the *Ilyonectria* complex
A. ROJAS (1), H. L. Liao (2,3), G. Bonito (4), K. M. Hameed (1), P. E. Busby (1,5), I. Grigoriev (6), C. Schadt (7), J. Labbe (7), G. Tuskan (7), R. J. Vilgalys (1), (1) Duke University, Durham, NC, U.S.A.; (2) University of Florida, Quincy, FL, U.S.A.; (3) University of Florida, Quincy, FL, U.S.A.; (4) Michigan State University, East Lansing, MI, U.S.A.; (5) Oregon State University, Corvallis, OR, U.S.A.; (6) US DOE Joint Genome Institute, Walnut Creek, CA, U.S.A.; (7) Oak Ridge National Laboratory, Oak Ridge, TN, U.S.A.

8:45 a.m. • 24-O

Disease dynamics of *Verticillium* wilt fungi in the biocontrol of *Ailanthus altissima*.
K. WICKERT (1), M. T. Kasson (2), (1) West Virginia University, Morgantown, WV, U.S.A.; (2) West Virginia University, Division of Plant and Soil Sciences, Morgantown, WV, U.S.A.

9:00 a.m. • 25-O

Radiant energy thresholds and spectral distribution of light as regulatory factors in sporulation of *Erysiphe necator*
T. MCCANN (1), M. D. Carter (1), D. M. Gadoury (1), M. Rea (2), (1) Cornell University, Geneva, NY, U.S.A.; (2) Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, U.S.A.

Phenotyping and Population Dynamics

8:00 – 9:15 a.m. Room 225B, Convention Center

Moderators: Alejandra Munoz Bodnar, University of Florida, Gainesville, FL, U.S.A.; Karasi B. Mills, Ohio State University, Wooster, OH, U.S.A.

8:00 a.m. • 26-O

Feeling the heat: Towards predicting pitch canker outbreaks in the context of climate change
T. QUESADA (1), J. Hughes (1), K. Smith (2), P. James (1), K. Shin (1), C. Staub (1), M. Marsik (1), J. A. Smith (1), (1) University of Florida, Gainesville, FL, U.S.A.; (2) USDA Forest Service, Gainesville, FL, U.S.A.

8:15 a.m. • 27-O

Three complete genome sequences of novel *Xanthomonas citri* strains from Texas carry atypical PthA alleles and unusual large plasmids

A. MUNOZ BODNAR (1), G. Santillana (2), V. A. Mavrodieva (3), Z. Liu (4), M. K. Nakhla (3), D. W. Gabriel (1), (1) University of Florida, Gainesville, FL, U.S.A.; (2) APHIS, Beltsville, MD, U.S.A.; (3) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, U.S.A.; (4) USDA APHIS PPQ, Riverdale, MD, U.S.A.

8:30 a.m. • 28-O

Differences in *FU.S.A.rium* species in brown midrib sorghum and in air populations in production fields

D. L. FUNNELL-HARRIS (1), E. Scully (2), S. Sattler (1), P. O'Neill (1), (1) USDA-ARS, Lincoln, NE, U.S.A.; (2) USDA-ARS, Manhattan, KS, U.S.A.

8:45 a.m. • 29-O

Population dynamics of *Phytophthora rubi* indicate high rates of migration between states and nurseries in the Pacific Northwestern United States

J. TABIMA (1), I. A. Zasada (2), N. Grunwald (2), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.

9:00 a.m. • 30-O

Characterizing Optimum Conditions for the *Lolium* pathotype of *Magnaporthe oryzae* to Infect and Cause Wheat Blast

K. B. MILLS (1), P. A. Paul (2), L. V. Madden (2), (1) Ohio State University, Wooster, OH, U.S.A.; (2) Ohio State Univ, Ohio Agricultural Research and Development Center, Dept of Plant Pathology, Wooster, OH, U.S.A.

Resistance Identification

8:00 – 9:15 a.m. • Room 225D, Convention Center

Moderators: Zhou Zhou, Southern Illinois University, Carbondale, IL, U.S.A.; Alejandra I. Huerta, Colorado State University, Fort Collins, CO, U.S.A.

8:00 a.m. • 31-O

Simultaneous fine mapping and locus characterization of the Andean *Ur-4* and Mesoamerican *Ur-5* rust resistance genes in Common bean

O. P. HURTADO-GONZALES (1), G. Valentini (2), T. Gilio (2), Q. Song (1), M. Pastor-Corrales (1), (1) Soybean Genomics & Improvement Lab, BARC-West, ARS-USDA, Beltsville, MD, U.S.A.; (2) Universidade Estadual de Maringá, Maringá, PR, BRAZIL

8:15 a.m. • 32-O

Soybean resistance locus *Rhg1* can confer resistance in diverse plant families to multiple cyst nematode species

K. J. BUTLER (1), J. Smith (1), S. Chen (2), X. Wang (3), A. F. Bent (1), (1) University of Wisconsin-Madison, Department of Plant Pathology, Madison, WI, U.S.A.; (2) Cornell University, School of Integrative Plant Science, Ithaca, NY, U.S.A.; (3) USDA-ARS, Robert W. Holley Center for Agriculture and Health, Ithaca, NY, U.S.A.

8:30 a.m. • 33-O

New sources of soybean cyst nematode resistance in 'Forrest' soybean identified through forward and reverse genetics

Z. ZHOU (1), N. Lakhssassi (1), S. Liu (1), S. Bekal (1), V. Colantonio (1), K. Lambert (2), A. Barakat (3), K. Meksem (1), (1) Southern Illinois University, Carbondale, IL, U.S.A.; (2) University of Illinois, Urbana, IL, U.S.A.; (3) University of South Dakota, Vermillion, SD, U.S.A.

8:45 a.m. • 34-O

Characterization and marker development for three resistance loci to the spinach downy mildew pathogen

C. FENG (1), B. H. Bluhm (1), J. C. Correll (2), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) Univ of Arkansas, Fayetteville, AR, U.S.A.

9:00 a.m. • 35-O

Lose the effector or die tryin': Novel quantitative resistance loci for bacterial blight

A. I. HUERTA (1), E. Delorean (1), A. Bossa-Castro (1), C. Raghavan (2), R. Corral (1), V. M. Verdier (3), H. Leung (4), J. E. Leach (1), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) International Rice Research Institute, Metro Manila 1301, PHILIPPINES; (3) IRD, Cirad, Univ Montpellier, IPME, Montpellier, FRANCE; (4) Intl Rice Research Inst, Metro Manila, PHILIPPINES

Virus Biology

8:00 – 9:15 a.m. • Room 225C, Convention Center

Moderators: Shaonpius Mondal, Cornell University, Ithaca, NY, U.S.A.; Maria Regina Mendoza, Texas A&M University, College Station, TX, U.S.A.

8:00 a.m. • 36-O

Viral metagenomics uncovers virus diversity in wild and cultivated blueberry (*Vaccinium corymbosum*)

N. SAAD (1), R. I. Alcalá-Briseño (1), P. Harmon (1), J. Polston (1), J. Olmstead (2,3), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Horticultural Science, University of Florida, Gainesville, FL, U.S.A.; (3) Driscoll's, Watsonville, CA, U.S.A.

8:15 a.m. • 37-O

Current status of Tomato chlorotic spot virus in Florida and the Caribbean

S. T. ADKINS (1), S. Hutton (2), C. Estevez de Jensen (3), J. E. Funderburk (4), W. W. Turechek (5), (1) USDA ARS USHRL, Fort Pierce, FL, U.S.A.; (2) University of Florida, Wimauma, FL, U.S.A.; (3) University of Puerto Rico, Agro-environmental Sciences, Mayaguez, PR, U.S.A.; (4) University of Florida, Quincy, FL, U.S.A.; (5) USDA ARS SAA SPP, Fort Pierce, FL, U.S.A.

8:30 a.m. • 38-O

Strain specificity of helper components encoded by *Potato virus Y*

S. MONDAL, G. Stewart, Cornell University, Ithaca, NY, U.S.A.

8:45 a.m. • 39-O

Two RNA viruses as tools for the co-expression of proteins in the same cells of infiltrated plants

M. R. MENDOZA, B. D. Shaw, H. B. Scholthof, Texas A&M University, College Station, TX, U.S.A.

9:00 a.m. • 40-O

Viral delivery of a gene editing tool for transient screening of gene function

W. B. CODY (1), H. B. Scholthof (1), T. E. Mirkov (2), (1) Texas A&M University, College Station, TX, U.S.A.; (2) Texas A&M Agrilife, Weslaco, TX, U.S.A.

MONDAY AFTERNOON, AUGUST 7

All Scientific Sessions take place in the CONVENTION CENTER.

Special Sessions listed first, followed by Oral Technical Sessions. Listed alphabetical by session title.

Find complete details on the meeting website apsnet.org/meet.

As a courtesy to presenters, please DO NOT TAKE PHOTOS during their presentation or of the slide content without presenter approval.

Session content listed in the program is as submitted by the authors/presenter and has NOT been edited.

Hot Topic

Science as Story and Story as Science: Telling Plant Pathology Research Stories

1:00 – 2:15 p.m., • Room 221A, Convention Center

Organizers and Moderators: Jim Bradeen, Dylan VanBoxtel, Department of Plant Pathology, University of Minnesota, St. Paul, MN, U.S.A.

As scientists, educators, and communicators we have all heard the adage “we should be telling our story and educating people about science.” But for some, storytelling (especially when it is about our research) seems daunting. *Who is the audience? How can I make my science accessible without ‘dumbing it down’? How can I get my message out there?* Come to this session to learn what research tells us about how to craft narratives to increase comprehension, interest, and engagement. You will learn about and work with one framework for translating plant pathology research into stories for nonexpert audiences. You will walk away from this session with quick and easy ideas about how you can tell effective plant pathology research stories that align with your personal brand.

Special Sessions

A Bridge over Troubled Ecosystems: How Host Cultivation Creates Novel Pathogens

1:00 – 2:15 p.m. • Room 221D, Convention Center (live-streamed session)

Organizers: Denita Hadziabdic, University of Tennessee, Knoxville, TN, U.S.A.; Jason A. Smith, University of Florida, Gainesville, FL, U.S.A.

Moderators: Denita Hadziabdic, University of Tennessee, Knoxville, TN, U.S.A.; Anna O. Conrad, University of Kentucky, Lexington, KY, U.S.A.

Section: Epidemiology

Sponsoring Committee: Forest Pathology Committee

1:00 p.m. • 33-S

Rapid Ohia Death: The fast track from houseplants to Hawaii’s native forests?

L. M. KEITH, USDA-ARS, Hilo, HI, U.S.A.

1:15 p.m. • 34-S

Pathways and populations in Phytophthora: A legacy of destruction

E. M. GOSS (1), J. Wang (2), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Kansas State University, Manhattan, KS, U.S.A.

1:30 p.m. • 35-S

Tree domestication and host jump trigger the making of a novel tree disease

N. FEAU (1), R. C. Hamelin (1,2), (1) Department of Forest and Conservation Sciences, University of British Columbia, Vancouver, BC, CANADA; (2) Institut de Biologie Intégrative des Systèmes, Université Laval, Québec, CANADA

1:45 p.m. • 36-S

Fly without wings: Genetic structure and adaptation of fungal pathogen and associates with bark beetle outbreak in the western Canada and U.S.A.

C. K. M. TSUI (1,2), D. Alayon (1), N. Feau (1), Y. Zhang (1), A. Capron (1), B. Dhillon (3), R. C. Hamelin (1), (1) Department of Forest and Conservation Sciences, University of British Columbia, Vancouver, BC, CANADA; (2) Faculty of Medicine, University of British Columbia, Vancouver, BC, CANADA; (3) University of Arkansas, Fayetteville, AR, U.S.A.

2:00 p.m. • 37-S

Sphaerulina through history in North America: Consequences of human-aided dissemination

M. L. SAKALIDIS, Michigan State University, East Lansing, MI, U.S.A.

Genomics-Based Approaches Facilitate Diagnostic and Population Genetic Marker Development for Plant Pathogens

1:00 – 2:15 p.m. • Room 221B, Convention Center

Organizers: Edwin Rene Palencia, North Carolina State University, Raleigh, NC, U.S.A.; Erica M. Goss, Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; Jeffrey James Coleman, Auburn University, Auburn, AL, U.S.A.; Steve Klosterman, USDA ARS, Salinas, CA, U.S.A.

Section: Diseases of Plants

Sponsoring Committees: Evolutionary Genetics and Genomics Committee, Diagnostics Committee

1:00 p.m. • 38-S

Next-generation sequencing to develop molecular diagnostics for *Pseudoperonospora cubensis*

L. M. QUESADA, North Carolina State University, Raleigh, NC, U.S.A.

1:15 p.m. • 39-S

Understanding and managing emerging diseases in the southeastern U.S. using comparative genomics for marker development for fungal plant pathogens

M. T. BREWER, L. G. Sumabat, H. Li, University of Georgia, Athens, GA, U.S.A.

1:30 p.m. • 40-S

Searching for the genetic basis of phenotypic traits of interest of the caU.S.A.l agent of late blight disease through a genome-wide association study

G. DANIES (1), L. Gonzalez-Garcia (1), K. L. Myers (2), H. S.

Judelson (3), W. E. Fry (2), S. Restrepo (1), (1) Universidad de los Andes, Bogota, COLOMBIA; (2) Cornell University, Ithaca, NY, U.S.A.; (3) University of California, Riverside, CA, U.S.A.

1:45 p.m. • 41-S

Marker development for *Puccinia striiformis* f. sp. tritici
X. HU, Northwest A&F University, China, Yangling, CHINA

2:00 p.m. • 42-S

Comparative genomics informed detection of *Pseudomonas syringae* associated with bacterial leaf spot of watermelon and squash

E. NEWBERRY (1), D. Mol (2), J. B. Jones (3), M. Paret (4), R. Willmann (2), B. P. Woudt (2), (1) University of Florida, Quincy, FL, U.S.A.; (2) Syngenta Seeds, Enkhuizen, NETHERLANDS; (3) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (4) North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.

Phyllosphere Microbial Assemblages: Friends, Foes, and Strangers

1:00 – 2:15 p.m. • Room 221C, Convention Center

Organizers: Steve Lindow, University of California Berkeley, Berkeley, CA, U.S.A.; Robin Choudhury, University of California Davis, Davis, CA, U.S.A.

Moderators: Robin Choudhury, University of California Davis, Davis, CA, U.S.A.; Steve Lindow, University of California Berkeley, Berkeley, CA, U.S.A.

Section: Epidemiology

Sponsoring Committees: Phyllosphere Microbiology Committee, Bacteriology Committee

1:00 p.m. • 43-S

Light as a driver of phyllosphere microbial behavior
G. A. BEATTIE, Iowa State University, Ames, IA, U.S.A.

1:15 p.m. • 44-S

Nonpathogens in the phyllosphere
J. H. J. LEVEAU, University of California-Davis, Davis, CA, U.S.A.

1:30 p.m. • 45-S

Strangers with benefits, remaking the phyllosphere through disease
J. D. BARAK, University of Wisconsin-Madison, Madison, WI, U.S.A.

1:45 p.m. • 46-S

An unusual ménage à trois in the phyllosphere
R. R. BÉLANGER (1), J. Laur (1), C. Labbe (1), G. Bojarajan Ramakrishnan (1), P. D. Spanu (2), (1) Université Laval, Quebec, QC, CANADA; (2) Imperial College of Sci Tech & Medicine, London, UNITED KINGDOM

2:00 p.m. • 47-S

Get me out of here: Modeling in-canopy turbulence and pathogen dispersion
W. MAHAFFEE (1), B. Bailey (2), N. Miller (3), L. Ulmer (3), E. Pardyjak (3), R. Stoll (3), (1) USDA, Corvallis, OR, U.S.A.; (2) University of California, Davis, Davis, CA, U.S.A.; (3) University of Utah, Salt Lake, UT, U.S.A.

Recruiting Next Gen Scientists: Strategies for Inclusive Outreach

1:00 – 2:15 p.m. • Room 225A, Convention Center

Organizers: Denita Hadziabdic, University of Tennessee, Knoxville, TN, U.S.A.; Jose Pablo Dundore-Arias, University of Minnesota, St Paul, MN, U.S.A.; Kimberly D. Gwinn, University of Tennessee, Knoxville, TN, U.S.A.

Moderators: Jose Pablo Dundore-Arias, University of Minnesota, St Paul, MN, U.S.A.; Bonnie H. Ownley, University of Tennessee, Department of Entomology and Plant Pathology, Knoxville, TN, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committees: Committee for Diversity and Equality, Teaching Committee, Forest Pathology Committee

1:00 p.m. • 48-S

Citizen science at high school
M. YAKUB, University of Minnesota, St. Paul, MN, U.S.A.

1:15 p.m. • 49-S

Fostering aGIRLculture: STEM camp solving the grand challenges of the 21st century
D. HADZIABDIC (1), L. Duncan (1), N. Bumgarner (1), F. Critzer (1), L. Edwards (1), K. Gwinn (2), L. Muller (1), C. Stephens (1), M. Velandia (1), C. Buschermohle (1), J. DeBruyn (1), E. Gall (1), J. Logan (1), A. Ludwig (1), A. L. Wszelaki (1), R. Trout Fryxell (1), H. M. Kelly (3), B. H. Ownley (1,2), K. Lewis (1), D. D'Souza (4), K. Jones (1), S. Jean-Philippe (1), E. Willcox (1), M. Prado (1), (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) University of Tennessee, Department of Entomology and Plant Pathology, Knoxville, TN, U.S.A.; (3) University of Tennessee, Jackson, TN, U.S.A.; (4) University of Tennessee, Food Science Department, Knoxville, TN, U.S.A.

1:30 p.m. • 50-S

Teach the Teachers: The Florida Experience
M. L. ELLIOTT, University of Florida, Fort Lauderdale, FL, U.S.A.

1:45 p.m. • 51-S

Integrating plant diseases into the K-12 STEM classroom
R. L. HIRSCH, University of Kentucky, Lexington, KY, U.S.A.

2:00 p.m. • 52-S

Nurturing agricultural migrant workforce
L. SANTAMARIA, Oregon State University, Aurora, OR, U.S.A.

Technical Sessions

Bacterial Virulence and Effectors

1:00 – 2:15 p.m. • Room 225B, Convention Center

Moderators: Libo Shan, Texas A&M University, College Station, TX, U.S.A.; Amelia Lovelace, University of Georgia, Athens, GA, U.S.A.

1:00 p.m. • 41-O

TAL effector-mediated induction of a SWEET sugar transporter gene confers susceptibility to bacterial blight of cotton
L. SHAN (1), K. Cox (2), (1) Dept. Plant Pathology & Microbiology, Texas A&M University, College Station, TX, U.S.A.; (2) Dept. Plant Pathology and Microbiology, Texas A&M University, College Station, TX, U.S.A.

1:15 p.m. • 42-O

A truncated *Xanthomonas oryzae* TAL effector required for effector triggered immunity suppression in an American heirloom rice cultivar

A. C. READ (1), F. Rinaldi (1), M. Hutin (1), Y. Q. He (2), L. R. Triplett (3), A. J. Bogdanove (1), (1) Cornell University, Ithaca, NY, U.S.A.; (2) Guangxi Univ, Nanning, CHINA; (3) Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.

1:30 p.m. • 43-O

Dynamic expression of T3SS genes in single cells of *Dickeya dadantii* during the interaction with potato

Z. CUI (1,2), X. Yuan (3), Q. Zeng (1), C. H. Yang (2), (1) Department of Plant Pathology & Ecology, The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.; (2) Department of Biological Sciences, University of Wisconsin-Milwaukee, Milwaukee, WI, U.S.A.; (3) Institute of Plant Protection, Jiangsu Academy of Agricultural Sciences, Nanjing, CHINA

1:45 p.m. • 44-O

A change in perspective: PAMP triggered immunity as told by *Pseudomonas syringae* pv. tomato

A. LOVELACE, B. Kvitko, University of Georgia, Athens, GA, U.S.A.

2:00 p.m. • 45-O

Immunity at cauliflower hydathodes controls infection by *Xanthomonas campestris* pv. *campestris*.

A. CERUTTI (1), A. Jauneau (2), M. C. Auriac (2), E. Lauber (1), Y. Martinez (2), S. Chiarenza (3), N. Leonhardt (3), R. Bethomé (1), L. Noel (1), (1) LIPM Laboratoire des Interactions Plantes Micro organismes, UMR CNRS / INRA 2594/441, Castanet-Tolosan, FRANCE; (2) Institut Fédératif de Recherche 3450, Plateforme Imagerie, Castanet-Tolosan, FRANCE; (3) UMR7265, Laboratoire de Biologie du Développement des Plantes, Saint-Paul-lez-Durance, FRANCE

Fungicide Resistance

1:00 – 2:15 p.m. • Room 225D, Convention Center

Moderators: Stefano Torriani, Syngenta Crop Protection, Stein, SWITZERLAND; Ayodeji Owati, Montana State University, Bozeman, MT, U.S.A.

1:00 p.m. • 46-O

Multiple resistance in fungal plant pathogens: selection schemes and impact on disease control management strategies.

S. TORRIANI, G. Scalliet, H. Sierotzki, Syngenta Crop Protection, Stein, SWITZERLAND

1:15 p.m. • 47-O

Complex Patterns of Resistance to Respiration Inhibitors Revealed among *Corynespora cassicola* Isolates from Tomato in Florida

K. J. MACKENZIE (1), A. Wen (2), G. E. Vallad (3), H. Adkison (4), L. L. Hellu (1), (1) Gulf Coast Research & Education Center, Wimauma, FL, U.S.A.; (2) University of Florida, Wimauma, FL, U.S.A.; (3) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, U.S.A.; (4) Univ of Florida GCREC, Wimauma, FL, U.S.A.

1:30 p.m. • 48-O

The detection and characterization of QoI-resistant pathogens causing ascochyta blight of pulse crops in Montana

A. OWATI, Montana State University, Bozeman, MT, U.S.A.

1:45 p.m. • 49-O

Managing an oomycete community: fungicide sensitivity and evolution of resistance to ethaboxam

Z. NOEL (1), A. Rojas (2), J. L. Jacobs (1), M. Chilvers (1), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Duke University, Durham, NC, U.S.A.

2:00 p.m. • 50-O

Fungicide Resistant Phenotypes in *Botrytis cinerea* from Mandarin and Their Impact on Control of Gray Mold on Stored Mandarin Fruit in California

S. SAITO (1), C. L. Xiao (2), (1) USDA ARS, Parlier, CA, U.S.A.; (2) USDA-ARS, Parlier, CA, U.S.A.

Oomycete Diversity

1:00 – 2:15 p.m. • Room 225C, Convention Center

Moderators: Amanda C. Saville, North Carolina State University, Raleigh, NC, U.S.A.; Maria Fernanda Proano, Oklahoma State University, Stillwater, OK, U.S.A.

1:00 p.m. • 51-O

Evolutionary relatedness and sources of US lineages of *Phytophthora infestans* (Mont.) de Bary.

A. C. SAVILLE, J. Ristaino, North Carolina State University, Raleigh, NC, U.S.A.

1:15 p.m. • 52-O

A new multilocus genotype of *Phytophthora nicotianae* found in isolates from pineapple heart rot disease

M. F. RATTI (1), M. Ascunce (1), J. Landivar (2), E. M. Goss (1), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Facultad de Ingeniería Marítima, Ciencias Biológicas Oceánicas y Recursos Naturales, ESPOL, Guayaquil, ECUADOR

1:30 p.m. • 53-O

Population Structure of the oomycete soilborne pathogen *Phytophthora capsici* in North Carolina

L. M. Quesada, C. H. PARADA ROJAS, North Carolina State University, Raleigh, NC, U.S.A.

1:45 p.m. • 54-O

Temporal and host driven variation of *Pythium* and *Globisporangium* populations in chrysanthemum and geranium

M. F. PROANO (1), C. Ayala (2), A. Chiriboga (2), P. Garrido (3), E. Diaz (1), S. M. Marek PhD (1), H. A. Melouk (4), M. L. Daughtrey (5), C. D. Garzon PhD (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) Universidad de las Fuerzas Armadas ESPE, Sangolqui, ECUADOR; (3) AGROCALIDAD, Quito, ECUADOR; (4) USDA ARS, Stillwater, OK, U.S.A.; (5) Cornell University, Long Island, NY, U.S.A.

2:00 p.m. • 55-O

Unraveling historical shifts in *Pseudoperonospora cubensis* populations in the U.S. that resulted in the 2004 cucurbit downy mildew epidemic

A. RAHMAN (1), E. Wallace (2), J. A. Crouch (3), F. N. Martin (4), L. Quesada-Ocampo (5), (1) NCSU, Raleigh, NC, U.S.A.; (2) North Carolina State University, Raleigh, NC, U.S.A.; (3) Mycology and Nematology Genetic Diversity and Biology Laboratory, USDA-ARS, Beltsville, MD, U.S.A.; (4) USDA ARS, Salinas, CA, U.S.A.; (5) Department of Plant Pathology North Carolina State University, Raleigh, NC, U.S.A.

TUESDAY MORNING, AUGUST 8

All Scientific Sessions take place in the CONVENTION CENTER.

Special Sessions listed first, followed by Oral Technical Sessions. Listed alphabetical by session title.

Find complete details on the meeting website APSNET.ORG/MEET

As a courtesy to presenters, please DO NOT TAKE PHOTOS during their presentation or of the slide content without presenter approval.

Session content listed in the program is as submitted by the authors/presenter and has NOT been edited.

Special Sessions

17th I. E. Melhus Graduate Student Symposium: Today's Students Addressing Tomorrow's Challenges Concerning Plant Diseases and Phytobiomes

8:30 – 11:30 a.m. • Room 225A, Convention Center

Organizers: Pierce A. Paul, Ohio State Univ, Ohio Agricultural Research and Development Center, Dept of Plant Pathology, Wooster, OH, U.S.A.; Forrest W. Nutter Jr., Iowa State University, Ames, IA, U.S.A.

Moderators: Forrest W. Nutter Jr., Iowa State University, Ames, IA, U.S.A.; Pierce A. Paul, Ohio State Univ, Ohio Agricultural Research and Development Center, Dept of Plant Pathology, Wooster, OH, U.S.A.

Section: Epidemiology

Sponsoring Committees/Sponsors: APS Epidemiology Committee

Financial Sponsor: APS Foundation, APS Crop Loss and Risk Evaluation Committee, DuPont Pioneer, and APS Epidemiology Committee, Monsanto, APHIS Widely Prevalent Bacteria Committee

8:30 a.m. • I.E. Melhus-Graduate Mentor and APS Leader

8:45 a.m. • 53-S

Ecology and epidemiology of grapevine red blotch disease
E. CIENIEWICZ, M. Fuchs, Cornell University, Geneva, NY, U.S.A.

9:15 a.m. • 54-S

Optimization of fungicides for disease management and enhanced overwintering of stevia
A. KOEHLER, North Carolina State University, Raleigh, NC, U.S.A.

9:45 a.m. • Break

10:00 a.m. • 55-S

Microbiome Networks: A Systems Framework for Identifying Candidate Microbial Assemblages for Disease Management in the Era of Genomics and Phytobiomes
R. POUDEL (1,2,3), L. Meyer (4), A. Jumpponen (5), M. M. Kennelly (6), C. L. Rivard (4), D. C. Schlatter (7), T. C. Paulitz (7), B. B. McSpadden Gardener (8), L. L. Kinkel (9), K. A. Garrett (1,10,11), (1) Plant Pathology Department, University of Florida, Gainesville, FL, U.S.A.; (2) Emerging Pathogens Institute, University of Florida, Gainesville, FL, U.S.A.; (3) Institute for Sustainable Food Systems, University of Florida, Gainesville, FL, U.S.A.; (4) Kansas State Research & Extension Center, Olathe, KS, U.S.A.; (5) Biology Department, Kansas State University, Manhattan, KS, U.S.A.; (6) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (7) USDA ARS, Pullman, WA, U.S.A.; (8) Ohio State University,

Wooster, OH, U.S.A.; (9) University of Minnesota, St Paul, MN, U.S.A.; (10) Emerging Pathogens Institute, Gainesville, FL, U.S.A.; (11) Institute for Sustainable Food Systems, Gainesville, FL, U.S.A.

10:30 a.m. • 56-S

Effects of three chemical compounds on *Ralstonia solanacearum* physiological functions and disease development
H. T. TSENG, A. L. Mila, North Carolina State University, Raleigh, NC, U.S.A.

11:00 a.m. • Honorable Mention Awards and Wrap up

Addressing Nematode Parasitic Tactics Through Biology

8:30 – 11:30 a.m. • Room 225C, Convention Center

Organizers: Qianwei Jiang, Monsanto Vegetable Seeds, Felda, FL, U.S.A.; Rachel Medina, Ohio State Univ, Wooster, OH, U.S.A.

Moderator: Qianwei Jiang, Monsanto Vegetable Seeds, Felda, FL, U.S.A.

Section: Molecular and Cellular Plant-Microbe Interactions

Sponsoring Committees: Nematology Committee, Soil Microbiology and Root Diseases Committee

Financial Sponsor: Monsanto

8:30 a.m. • 57-S

Global efforts to control potato cyst nematodes
L. M. C. DANDURAND, University of Idaho, Moscow, ID, U.S.A.

9:00 a.m. • 58-S

Breadth of nematode effectors
M. G. MITCHUM, University of Missouri, Columbia, MO, U.S.A.

9:30 a.m. • 59-S

Nematode parasitism genes and their manipulation of host plants
C. GLEASON (1), L. Zhang (1), N. Leelarasamee (2), J. Utermark (2), S. Habash (3), A. Elashry (3), (1) Washington State University, Pullman, WA, U.S.A.; (2) Georg August University, Goettingen, GERMANY; (3) Bonn University, Bonn, GERMANY

10:00 a.m. • Break

10:15 a.m. • 60-S

The soybean cyst nematode: Managing a chronic disease using sustainable approaches
K. LAMBERT, University of Illinois, Urbana, IL, U.S.A.

10:45 a.m. • 61-S

New technologies for nematode management: RNAi
P. VIEIRA, Virginia Polytechnic Institute and State University, Blacksburg, VA, U.S.A.

New Products and Services, Part II

10:15 – 11:45 a.m. • Room 221B, Convention Center

Organizer and Moderator: Neil Glynn, Syngenta, Vero Beach, FL, U.S.A.

Section: Plant Disease Management

Sponsoring Committee: Industry Committee

10:15 a.m.

A2000 Growth Chamber; M. SINGLE, Convion, Winnipeg, Manitoba, Canada

10:30 a.m.

ARM Trial Management Software Enhancements; S. GYLLING, Gylling Data Management Inc., Brookings, South Dakota, U.S.A.

10:45 a.m.

CANARY HLB Assay for Psyllids; A. FLANNERY, Pathsensors, Baltimore, Maryland, U.S.A.

11:00 a.m.

sporeSENTRY; M. ANDREOU, OptiGene Limited, Horsham, West Sussex

11:15 a.m.

AG13064; T. A. HAYDEN, Winfield United, Owensboro, Kentucky, U.S.A.

11:30 a.m.

Dominus Biofumigant; G. STALLINGS, Isagro, Cama, Washington, U.S.A.

Re-emergence of Bacterial Blight of Cotton

8:30 – 9:45 a.m. • Room 221C, Convention Center

Organizers: Jason E. Woodward, Texas A&M AgriLife Extension Service, Lubbock, TX, U.S.A.; Libo Shan, Texas A&M University, College Station, TX, U.S.A.

8:30 a.m. • 62-S

Genetic diversity among host and pathogen in the cotton bacterial blight pathosystem
R. BART, Donald Danforth Plant Science Center, St Louis, MO, U.S.A.

8:45 a.m. • 63-S

A 20-year Hiatus of Bacterial Blight
T. WHEELER, Texas A&M AgriLife Research, Lubbock, TX, U.S.A.

9:00 a.m. • 64-S

qPCR Detection of Bacterial Blight Pathogen of Cotton
T. W. ALLEN JR., Mississippi State Univ, Stoneville, MS, U.S.A.

9:15 a.m. • 65-S

Mechanisms of Susceptibility to Bacterial Blight in Cotton
K. Cox (1), L. SHAN (2), (1) Dept. Plant Pathology and Microbiology, Texas A&M University, College Station, TX, U.S.A.; (2) Texas A&M University, College Station, TX, U.S.A.

9:30 a.m. • 66-S

Management strategies for Bacterial Blight in Cotton
J. E. WOODWARD, Texas A&M AgriLife Extension Service, Lubbock, TX, U.S.A.

The Rise and Management Challenges of Multi-Fungicide-Resistant Pathogens • ICPP2018 Preview Topic

8:30 – 11:30 a.m. • Room 221D, Convention Center (live-streamed session)

Organizers: Guido Schnabel, Clemson University, Clemson, SC, U.S.A.; Jeffrey Stein, Monsanto, Chesterfield, MO, U.S.A.; Jeffrey R. Standish, University of Georgia, Tifton, GA, U.S.A.; Allysson Lunos, LSU AgCenter, Baton Rouge, LA, U.S.A.

Moderators: Allysson Lunos, LSU AgCenter, Baton Rouge, LA, U.S.A.; Jeffrey R. Standish, University of Georgia, Tifton, GA, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees: Pathogen Resistance Committee, Chemical Control Committee

Financial Sponsor: Monsanto, Dow AgroSciences, BASF Corporation, Syngenta

8:30 a.m. • 67-S

The advent and spread of prodigious multi-fungicide resistance in *Botrytis cinerea*
G. SCHNABEL (1), M. Hahn (2), N. Peres (3), M. Hu (1), (1) Clemson University, Clemson, SC, U.S.A.; (2) Department of Biology, University of Kaiserslautern, Kaiserslautern, GERMANY; (3) Gulf Coast Research and Education Center; University of Florida, Wimauma, FL, U.S.A.

8:45 a.m. • 68-S

Evolution of multi-fungicide resistance in cereal pathogens and impact on disease control
B. B. FRAAIJE, Rothamsted Research, Hertfordshire, ENGLAND

9:15 a.m. • 69-S

Rethinking Apple IPM
J. L. BECKERMAN (1), G. W. Sundin (2), (1) Purdue Univ, West Lafayette, IN, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.

9:30 a.m. • 70-S

Healthy vegetables at the cost of multi-fungicide-resistant pathogens
M. T. MCGRATH, Cornell University, Riverhead, NY, U.S.A.

9:45 a.m. • Break

10:00 a.m. • 71-S

Multiple fungicide resistances in *Cercospora beticola* of sugar beet
G. A. SECOR (1), V. Rivera-Varas (1), M. D. Bolton (2), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) USDA ARS NCSL, Fargo, ND, U.S.A.

10:15 a.m. • 72-S

How to manage multiple fungicide resistance in plant-pathogenic fungi
G. STAMMLER, K. Klappach, BASF SE, Limburgerhof, GERMANY

10:30 a.m. • 73-S

Multiple resistance in fungal plant pathogens, its selection schemes and impact on disease control management strategies
S. TORRIANI, Syngenta Crop Protection, Stein, SWITZERLAND

10:45 a.m. • Panel Discussion

Translation of Basic Biological Control Research into Effective Grower Products and Practices

8:30 – 11:30 a.m. • Room 221A, Convention Center

Organizer and Moderator: Molly Cadle-Davidson, Advanced Biological Marketing, Inc., Geneva, NY, U.S.A.

Section: Biology and Disease Management

Sponsoring Committee: Biological Control Committee

8:30 a.m. • Welcoming Remarks

8:35 a.m. • 75-S

The phytobiome and biological control: What does the future hold?

J. E. LEACH, Colorado State University, Fort Collins, CO, U.S.A.

8:50 a.m. • Interactive

8:55 a.m. • 76-S

What happens to good results? From the academic research lab to labeled product for growers.

B. J. JACOBSEN (1), M. B. Dimock (2), (1) Montana State University, Bozeman, MT, U.S.A.; (2) Certis U.S.A., LLC, Columbia, MD, U.S.A.

9:25 a.m. • 77-S

The new biofungicide natamycin as a preplant dip treatment against QoI-resistant populations of *Colletotrichum acutatum* in strawberry

S. E. HAACK (1), K. L. Ivors (2), G. J. Holmes (2), H. C. Förster (1), J. E. Adaskaveg (1), (1) Department of Plant Pathology and Microbiology, University of California, Riverside, CA, U.S.A.; (2) Strawberry Center, California Polytechnic State University, San Luis Obispo, CA, U.S.A.

9:40 a.m. • Interactive

9:45 a.m. • Break

10:00 a.m. • 78-S

Accelerating microbial products for sustainable agriculture

S. HUSE, V. Urisn, Indigo Ag, Charlestown, MA, U.S.A.

10:30 a.m. • 79-S

Characterization of antimicrobial-producing beneficial bacteria from citrus rhizosphere

N. RIERA (1), Y. Zhang (2), U. Handique (1), N. Wang (1), (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) CREC, University of Florida, Lake Alfred, FL, U.S.A.

10:45 a.m. • Interactive

10:50 a.m. • 80-S

Nonbiological biological control

G. HARMAN (1,2), A. Moreno (3), W. Nosir (3), M. Cadle-Davidson (4), (1) Advanced biological marketing, Geneva, NY, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.; (3) Advanced Biological Marketing, Geneva, NY, U.S.A.; (4) Advanced Biological Marketing, Inc, Geneva, NY, U.S.A.

11:20 a.m. • Concluding Remarks

8:30 a.m. Technical Sessions

Oomycetes

8:30 – 9:45 a.m. • Room 225B, Convention Center

Moderators: William E. Fry, Cornell University, Ithaca, NY, U.S.A.; Terence Mhora, University of Delaware, Newark, DE, U.S.A.

8:30 a.m. • 56-O

Genic copy number variation reveals an unexpected mosaic of varying ratios of diploidy and triploidy among isolates of *Phytophthora infestans*

B. J. KNAUS (1), J. Tabima (2), S. Shakya (3), H. S. Judelson (4), N. Grunwald (5), (1) USDA ARS, Corvallis, OR, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) OREGON STATE UNIVERSITY, Corvallis, OR, U.S.A.; (4) University of California, Riverside, CA, U.S.A.; (5) USDA-ARS, Horticultural Crops Research Unit, Corvallis, OR, U.S.A.

8:45 a.m. • 57-O

Growth medium affects physiology and virulence of *Phytophthora infestans* sporangia.

S. P. Patev (1), W. E. FRY (2), (1) Clark University, Worcester, MA, U.S.A.; (2) Cornell University, Ithaca, NY, U.S.A.

9:00 a.m. • 58-O

Presence-absence polymorphism and balancing selection of RxLR genes in *Phytophthora* clade 1c species

S. SHAKYA (1), B. J. Knaus (2), J. Tabima (1), H. S. Judelson (3), N. Grunwald (2), (1) OREGON STATE UNIVERSITY, Corvallis, OR, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.; (3) University of California, Riverside, CA, U.S.A.

9:15 a.m. • 59-O

Application of Genotyping-by-Sequencing in the development of downy mildew resistant lima bean cultivars

T. MHORA (1), C. Scanlan (1), N. F. Gregory (1), E. Ernest (2), S. Polson (1), R. J. Wisser (1), T. A. Evans (1), N. M. Donofrio (1), (1) University of Delaware, Newark, DE, U.S.A.; (2) University of Delaware, Georgetown, DE, U.S.A.

9:30 a.m. • 60-O

Identification and characterization of *Phytophthora* isolates from citrus orchards of South Texas

S. CHAUDHARY (1,2,3), V. Ancona PhD (2), C. Barbola (4), (1) Texas A&M University, College Station, TX, U.S.A.; (2) Texas A&M Kingsville Citrus Center, Weslaco, TX, U.S.A.; (3) South Texas College, McAllen, TX, U.S.A.; (4) Texas A&M University-Kingsville, Citrus Center, Weslaco, TX, U.S.A.

Viral-Host Interactions

8:30 – 9:45 a.m. • Room 221B, Convention Center

Moderators: Larissa J. Osterbaan, Cornell University, Geneva, NY, U.S.A.; Kylie D. Swisher, USDA/ARS, Prosser, WA, U.S.A.

8:30 a.m. • 61-O

Use of KASP markers to screen the *Pisum sativum* single plant core collection and commercial varieties for resistance to *Pea seed-borne mosaic virus*

L. D. Porter, K. D. SWISHER, USDA-ARS, Prosser, WA, U.S.A.

8:45 a.m. • 62-O

Host protein interaction network associated with the non-

incorporated form of the potato leafroll virus RTP identified using mass spectrometry

S. L. DEBLASIO (1), A. R. Rebelo (2), R. Johnson (3), S. Gray (1,4), M. MacCoss (5), M. Cilia (1,2,4), (1) USDA-ARS, Ithaca, NY, U.S.A.; (2) Boyce Thompson Institute, Ithaca, NY, U.S.A.; (3) Department of Genome Sciences, University of Washington, Seattle, WA, U.S.A.; (4) Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.; (5) Department of Genomics Sciences, University of Washington, Seattle, WA, U.S.A.

9:00 a.m. • 63-O

Genetic and functional analysis of *va* resistance durability to *Potato virus Y* in tobacco

V. MICHEL (1), E. Julio (2), J. Cotucheau (2), F. Dorlhac de Borne (2), L. Glais (3), E. Jacquot (4), V. Decroocq (1), T. Candresse (1), S. German-Retana (1), (1) INRA Bordeaux, UMR 1332 BFP, Villenave d'Ornon, FRANCE; (2) Imperial Tobacco, Bergerac, FRANCE; (3) FN3PT/RD3PT, Paris, FRANCE; (4) INRA, Montpellier Cedex, FRANCE

9:15 a.m. • 64-O

Characterization of a symptom determinant of grapevine fanleaf virus suggests a novel function for its RNA-dependent RNA polymerase

L. J. OSTERBAAN, M. Fuchs, Cornell University, Geneva, NY, U.S.A.

9:30 a.m. • 65-O

Mapping Loci that Control Tuber and Foliar Symptoms Caused by PVY in Autotetraploid Potato (*Solanum tuberosum* L.)

W. L. DA SILVA (1), G. Stewart (2,3), W. De Jong (4), (1) Cornell University, Ithaca, NY, U.S.A.; (2) USDA, Agricultural Research Service, Ithaca, NY, U.S.A.; (3) Cornell University/USDA-ARS, Ithaca, NY, U.S.A.; (4) Cornell Univ, Ithaca, NY, U.S.A.

10:15 a.m. Hot Topic

Next Generation of Plant Pathologists Exploiting Sequencing Strategies to Further Our Understanding of Plant Virus-Insect Vector Interactions • ICPP2018 Preview Topic

10:15 – 11:30 a.m. • Room 221C, Convention Center

Organizer and Moderator: Ismael E. Badillo-Vargas, Texas A&M AgriLife Research, Weslaco, TX, U.S.A.

More than 250 plant-infecting viruses known to date are transmitted from plant-to-plant by insect vectors. The least common modes of transmission among these vector-borne plant-infecting viruses are the persistent-circulative and persistent-propagative; both of which involve the internalization and dissemination of virus particles inside the insect's body for transmission to occur. Currently, sequencing strategies are being exploited to understand the interactions between plant-infecting viruses with their insect vectors to not only further our knowledge of these complex interactions but also devise novel control strategies to deter the population increase of these little foes and transmission of these ugly, microscopic pathogens to increase good plant health and production. In this session, we will hear from early career professionals on how they are tackling different problems within this hot topic in plant pathology and insect vector biology.

Speakers:

- Understanding whitefly-virus interactions through genome sequencing and transcriptome analyses – Daniel K. Hasegawa, USDA-ARS, U.S. Vegetable Laboratory, U.S.A.
- Virus infection alters expression of transcripts with enriched abundance in the salivary gland of *Frankliniella occidentalis* – Sulley K. Ben-Mahmoud, Postdoctoral Research Associate, University of California-Davis, U.S.A.

10:15 a.m. Technical Sessions

Pathogen Virulence and Effectors

10:15 – 11:30 a.m. • Room 225B, Convention Center

Moderators: Pengfei Bai, The Ohio State University, Columbus, OH, U.S.A.; Miaoying Tian, University of Hawaii at Manoa, Honolulu, HI, U.S.A.

10:15 a.m. • 66-O

Role of lysine residues of the *Magnaporthe oryzae* effector AvrPiz-t in effector and PAMP-triggered immunity

P. BAI (1), C. H. Park (1), G. Shirsekar (2), P. Songkumarn (1), M. D. Bellizzi (1), G. L. Wang (1), (1) The Ohio State University, Columbus, OH, U.S.A.; (2) Max Planck Institute for Developmental Biology, Tuebingen, GERMANY

10:30 a.m. • 67-O

Localization and functional study of *Ustilago hordei* avirulence effector UhAVR1 using barley and *Nicotiana benthamiana* plant systems

A. P. MONTENEGRO ALONSO (1), G. Bakkeren (2), (1) University of British Columbia, Vancouver, CANADA; (2) Agric & Agri Food Canada, Summerland, BC, CANADA

10:45 a.m. • 68-O

A unique group of CLE effectors from cyst nematodes in the *Globodera* genus

P. Lang (1), S. Chen (1), I. A. Zasada (2), M. G. Mitchum (3), X. WANG (1,4), (1) Cornell University, School of Integrative Plant Science, Ithaca, NY, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.; (3) University of Missouri, Columbia, MO, U.S.A.; (4) USDA-ARS, Robert W. Holley Center for Agriculture and Health, Ithaca, NY, U.S.A.

11:00 a.m. • 69-O

Dissecting the pathogenicity mechanisms of *Phytophthora palmivora*

M. TIAN (1), R. L. Gumtow (1), N. Navet (1), D. Wu (1), S. Schornak (2), J. Y. Uchida (1), (1) University of Hawaii at Manoa, Honolulu, HI, U.S.A.; (2) Sainsbury Laboratory, University of Cambridge, Cambridge, UNITED KINGDOM

11:15 a.m. • 70-O

Phytophthora hijacks host BAG7 and bZIP28 resulting in sequestration in endoplasmic reticulum for compatibility via effector-mediated BiP accumulation

M. JING (1), Y. Li (1), Y. Wang (2), M. B. Dickman (1), (1) Texas A&M University, College Station, TX, U.S.A.; (2) Nanjing Agric Univ, Nanjing, Jiangsu, CHINA

TUESDAY AFTERNOON, AUGUST 8

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Special Sessions listed first, followed by Oral Technical Sessions. Listed alphabetical by session title.

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Hot Topic

Navigating Contentious Conversations

1:00 – 2:15 p.m. • Room 221A, Convention Center

Organizer: Paul Vincelli, University of Kentucky, Lexington, Kentucky, U.S.A.

Lessons learned from experienced plant pathologists about engaging the public in controversial issues.

- Scientific Responsibilities: Standing UP When You'd Rather Crawl Under a Rock - Juliet M. Marshall, University of Idaho, Idaho Falls, Idaho, U.S.A.
- Restoring Civil Discourse to the Topic of Fungicide Use in Field Crops - Kiersten A. Wise, Purdue University, West Lafayette, Indiana, U.S.A.
- Engaging the Public on Genetically Engineered Crops - Paul Vincelli, University of Kentucky, Lexington, Kentucky, U.S.A.

Special Sessions

Plant Pathologists of the Future: Showcasing the Top Graduate Students from APS Division Meetings

1:00 – 2:30 p.m. • Room 221B, Convention Center

Organizers: Nicole M. Donofrio, University of Delaware, Newark, DE, U.S.A.; Jay W. Pscheidt, Oregon State University, Corvallis, OR, U.S.A.

Moderators: Jay W. Pscheidt, Oregon State University, Corvallis, OR, U.S.A.; Nicole M. Donofrio, University of Delaware, Newark, DE, U.S.A.

1:00 p.m. • 81-S

Management of downy mildew of lima bean: chemical control
T. MHORA, A. Duckett, N. F. Gregory, T. A. Evans, N. M. Donofrio, University of Delaware, Newark, DE, U.S.A.

1:15 p.m. • 82-S

A phylogenetic network of the soilborne fungal pathogen *Sclerotium rolfsii* in the Southeastern US
P. S. SORIA (1), N. S. Dufault (2), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Univ of Florida, Gainesville, FL, U.S.A.

1:30 p.m. • 83-S

Plant-parasitic nematodes associated with potatoes (*Solanum tuberosum* L.) in different soil texture classes from Costa Rica
R. SANDOVAL RUIZ, L. Flores Chaves, D. Humphreys Pereira, University of Costa Rica, San José, COSTA RICA

1:45 p.m. • 84-S

Effects of fluopyram on soybean cyst nematode resistance management under greenhouse conditions
K. C. BRODERICK (1), C. Picinini (2), L. J. Giesler (3),

(1) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (2) Univeristy of Sao Paulo - Escola Superior de Agricultura Luiz de Queiroz, Piracicaba, BRAZIL; (3) Univ of Nebraska-Lincoln, Lincoln, NE, U.S.A.

2:00 p.m. • 85-S

Etiology and Management of Sour Rot in Grapes
M. HALL (1), G. Loeb (2), W. F. Wilcox (2), (1) Cornell University, Ithaca, NY, U.S.A.; (2) Cornell Univ, Geneva, NY, U.S.A.

2:15 p.m. • 86-S

Almond Trunk and Scaffold Canker Diseases in California: Diagnosis, Pathogenicity, and Management
L. A. HOLLAND (1), M. Nouri (2), N. Morris (1), M. Crespo (2), F. Trouillas (2), (1) Department of Plant Pathology, University of California, Davis, Davis, CA, U.S.A.; (2) Department of Plant Pathology, UC Kearney Ag. Research and Extension Center, Parlier, CA, U.S.A.

Pursuit of Solutions to Mycotoxin Risks by Next-Generation Plant Pathologists

1:00 – 2:15 p.m. • Room 225A, Convention Center

Organizers: Won-Bo Shim, Texas A&M University, College Station, TX, U.S.A.; Rebecca R. Sweany, Louisiana State Univ Ag Center, Baton Rouge, LA, U.S.A.

Moderator: Rebecca R. Sweany, Louisiana State Univ Ag Center, Baton Rouge, LA, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees: Mycotoxicology Committee, Integrated Plant Disease Management Committee

1:00 p.m. • 87-S

Aspergillus flavus functional genomics: Toward enhancing host resistance to aflatoxin contamination under drought using biotechnology
J. C. FOUNTAIN (1), G. Agarwal (1), P. Bajaj (2), M. Pandey (2), S. Nayak (3), R. C. Kemerait (4), R. Varshney (2), B. Guo (5), (1) University of Georgia, Tifton, GA, U.S.A.; (2) International Crop Research Institute for the Semi-Arid Tropics, Hyderabad, INDIA; (3) University of Agricultural Sciences, Dharwad, Dharwad, INDIA; (4) University of Georgia - Department of Plant Pathology, Tifton, GA, U.S.A.; (5) USDA ARS CPMRU, Tifton, GA, U.S.A.

1:15 p.m. • 88-S

Comparative genomics of *Aspergillus flavus* S and L morphotypes yields insights into niche adaptation
M. OHKURA (1), P. J. Cotty (2), M. Orbach (1), (1) University of Arizona, Tucson, AZ, U.S.A.; (2) USDA-ARS, University of Arizona, Tucson, AZ, U.S.A.

1:30 p.m. • 89-S

Computational prediction of time-course subnetwork modules associated with histidine kinase activities in maize pathogen *FU.S.A.rium verticillioide*
M. KIM, W. B. Shim, Texas A&M University, College Station, TX, U.S.A.

1:45 p.m. • 90-S

Modeling complex associations among weather, deoxynivalenol contamination, and FU.S.A.rium head blight in wheat
W. BUCKER MORAES (1), F. Dalla Lana (2), B. K. Baik (3), P. B. Schwarz (4), L. V. Madden (5), P. A. Paul (5), (1) The Ohio State University, Wooster, OH, U.S.A.; (2) Ohio State University, Columbus 43210, OH, U.S.A.; (3) United States Department of Agriculture, WOOSTER, OH, U.S.A.; (4) North Dakota State University, Fargo, ND, U.S.A.; (5) Ohio State Univ, Ohio Agricultural Research and Development Center, Dept of Plant Pathology, Wooster, OH, U.S.A.

2:00 p.m. • 91-S

Casting a new die: Integrating novel biological insights and translational approaches to combat mycotoxin problems in maize
J. B. RIDENOUR (1), W. D. Hawkins (1), B. Dhillon (1), J. E. Smith (1), Y. Ramegowda (1), W. B. Shim (2), C. P. Woloshuk (3), B. H. Bluhm (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) Texas A&M University, College Station, TX, U.S.A.; (3) Purdue University, West Lafayette, IN, U.S.A.

The Socioeconomic Impact of New and Re-emerging Bacterial Diseases: A National Perspective • ICPP2018 Preview Topic
1:00 – 2:15 p.m. • Room 221D, Convention Center (live-streamed session)

Organizers: Jose Pablo Dundore-Arias, University of Minnesota, St Paul, MN, U.S.A.; Ana Cristina Fulladolsa, University of Wisconsin, Madison, WI, U.S.A.; Alejandra I. Huerta, Colorado State University, Fort Collins, CO, U.S.A.

Moderators: Jose Pablo Dundore-Arias, University of Minnesota, St Paul, MN, U.S.A.; Ana Cristina Fulladolsa, University of Wisconsin, Madison, WI, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees: Bacteriology Committee, Epidemiology Committee, Emerging Diseases and Pathogens Committee

1:00 p.m. • 92-S

Epidemiology and distribution of bacterial leaf streak of corn caused by *Xanthomonas vasicola*
T. HARTMAN (1), J. Harbour (1), B. Tharnish (1), J. Van Meter (2), T. A. Jackson-Ziems (1), (1) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (2) Nebraska Department of Agriculture, Lincoln, NE, U.S.A.

1:15 p.m. • 93-S

Understanding the Recent Outbreak of *Dickeya diantholica* Causing Potato Soft Rot and Blackleg in the United States
J. HAO (1), A. O. Charkowski (2), S. Johnson (3), G. A. Secor (4), (1) University of Maine, Orono, ME, U.S.A.; (2) Colorado State University, Fort Collins, CO, U.S.A.; (3) Univ of Maine Coop Ext, Presque Isle, ME, U.S.A.; (4) North Dakota State University, Fargo, ND, U.S.A.

1:30 p.m. • 94-S

Zebra chip, what we know and where are we headed

E. A. PIERSON, Texas A and M University, College Station, TX, U.S.A.

1:45 p.m. • 95-S

Detection and characterization of *Xanthomonas vasicola* pv. *vasculorum* pv. nov. causing bacterial leaf streak of corn in the United States

J. M. LANG (1), E. DuCharme (1), J. R. Ibarra (1), E. Luna (1), T. Hartman (2), K. Korus (3), J. Rascoe (4), M. C. Ortiz (1), T. A. Jackson-Ziems (2), K. D. Broders (1), J. E. Leach (1), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (3) Alachua County Extension, University of Florida, Gainesville, FL, U.S.A.; (4) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, U.S.A.

2:00 p.m. • 96-S

The socioeconomic impact of emerging and re-emerging disease epidemics
A. O. CHARKOWSKI, Colorado State University, Fort Collins, CO, U.S.A.

Technical Sessions

Biological Control

1:00 – 2:15 p.m. • Room 221C, Convention Center

Moderators: Mark A. Weaver, USDA ARS, Stoneville, MS, U.S.A.; Ghazal Ebadzadsahrai, Midwestern University, Glendale, AZ, U.S.A.

1:00 p.m. • 71-O

Effect of a contact sterilant on apple flower microbial populations and impacts on biological control of fire blight by *Aureobasidium pullulans*

S. M. SLACK (1), S. Gebben (1,2), B. Begley (1), C. A. Outwater (1), G. W. Sundin (1), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) University of Florida, Immokalee, FL, U.S.A.

1:15 p.m. • 72-O

Bioplastic seed coating formulations combining pesticides with biocontrol isolates to control agricultural pests
H. K. ABBAS (1), C. Accinelli (2), W. T. Shier (3), (1) USDA ARS BCPRU, Stoneville, MS, U.S.A.; (2) University of Bologna, Bologna, ITALY; (3) University of Minnesota, College of Pharmacy, Minneapolis, MN, U.S.A.

1:30 p.m. • 73-O

Integration of biological control and transgenic insect protection for mitigation of mycotoxins in corn
M. A. WEAVER (1), H. K. Abbas (2), M. Brewer (3), L. Pruter (4), N. Little (5), (1) USDA ARS, Stoneville, MS, U.S.A.; (2) USDA ARS BCPRU, Stoneville, MS, U.S.A.; (3) Texas AgriLife Research and Extension Center-Corpus Christi, Corpus Christi, TX, U.S.A.; (4) Texas A&M AgriLife Research and Department of Entomology, Corpus Christi, TX, U.S.A.; (5) Southern Insect Management Research Unit USDA-ARS, Stoneville, MS, U.S.A.

1:45 p.m. • 74-O

A *Bacillus*-based biocontrol system for the mitigation of *Aspergillus* ear rot and aflatoxin contamination
S. CHALIVENDRA (1), J. A. Reyes-Pineda (1), C. DeRobertis

(1), K. E. Damann (2), (1) Louisiana State UniversityAgCenter, Baton Rouge, LA, U.S.A.; (2) Louisiana State University AgCenter, Baton Rouge, LA, U.S.A.

2:00 p.m. • 75-O

Inhibition of Fungal growth by bacterial volatiles
G. EBADZADSAHRAI, A. Harrison, S. Soby, Midwestern University, Glendale, AZ, U.S.A.

Epidemiology and Quantification of Disease

1:00 – 2:15 p.m. • Room 225B, Convention Center

Moderators: Mamadou L. Fall, Michigan State University, East Lansing, MI, U.S.A.; Kaitlin Morey Gold, University of Wisconsin-Madison, Madison, WI, U.S.A.

1:00 p.m. • 76-O

Spatial pattern of F.U.S.A.rium wilt (F.U.S.A.rium oxysporum f. sp. cubense) in banana fields
D. W. Heck (1), M. A. Dita Rodriguez (2), E. M. Del Ponte (1), E. S. G. MIZUBUTI (1), (1) Universidade Federal de Vicosa, Vicosa, BRAZIL; (2) Embrapa, Jaguariúna, SP, BRAZIL

1:15 p.m. • 77-O

Temporal distribution pattern of *Sclerotinia sclerotiorum* apothecia is modulated by row spacing and weather variables in soybean
M. L. FALL (1,2), J. F. Willbur (3), D. L. Smith (4), A. Byrne (1), M. Chilvers (1), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Agriculture and AgriFood Canada, Saint-Jean-sur-Richelieu, QC, CANADA; (3) University of Wisconsin - Madison, Madison, WI, U.S.A.; (4) University of Wisconsin, Madison, WI, U.S.A.

1:30 p.m. • 78-O

Spore production of *Phyllosticta* spp. in citrus leaf litter associated with citrus black spot in Florida
K. ZHANG (1), J. A. Rollins (2), M. M. Dewdney (1), (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.

1:45 p.m. • 79-O

Cold induced disease resistance may explain unexpected stalling of foliar epidemics of hop powdery mildew (*Podosphaera macularis*)
B. WELDON (1), D. M. Gadoury (1), L. E. Cadle-Davidson (2), (1) Cornell University, Geneva, NY, U.S.A.; (2) USDA Grape Genetics Research Unit, Geneva, NY, U.S.A.

2:00 p.m. • 80-O

Developing the capacity of reflectance spectroscopy for early late blight detection in potato
K. MOREY GOLD (1), J. Couture (2), P. Townsend (1), A. J. Gevens (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) Purdue University, West Lafayette, IN, U.S.A.

Fungicide Resistance and Fitness

1:00 – 2:15 p.m. • Room 225C, Convention Center

Moderators: Geunhwa Jung, University of Massachusetts, Amherst, MA, U.S.A.; Emma Lookabaugh, North Carolina State University, Raleigh, NC, U.S.A.

1:00 p.m. • 81-O

Multidrug resistance mechanisms by xenobiotics detoxification, a case story: *Sclerotinia homoeocarpa*, caU.S.A.l agent of dollar spot
G. JUNG (1), H. Sang (1), J. P. Hulvey (2), R. Green (1), T.

Chang PhD (3), (1) University of Massachusetts, Amherst, MA, U.S.A.; (2) Univ of Massachusetts, Amherst, MA, U.S.A.; (3) Kyungpook National University, Sangju, Gyungbuk, KOREA

1:15 p.m. • 82-O

Fitness, Competitive Ability and Mutation Stability of Strawberry Colletotrichum acutatum Isolates Resistant to Quinone-outside Inhibitor Fungicides
B. B. FORCELINI (1), C. Rebello (2), N. Peres (3), (1) University of Florida, Wimauma, FL, U.S.A.; (2) Universidade Estadual Paulista, Registro, BRAZIL; (3) Gulf Coast Research and Education Center; University of Florida, Wimauma, FL, U.S.A.

1:30 p.m. • 83-O

Sensitivity and resistant management for the SDHI fungicide fluxapyroxad in the apple scab pathogen *Venturia inaequalis*
K. AYER (1), S. M. Villani (2), K. D. Cox (1), (1) Cornell University, Geneva, NY, U.S.A.; (2) North Carolina State University, Mills River, NC, U.S.A.

1:45 p.m. • 84-O

High levels of fludioxonil resistance in *Botrytis fragariae* and investigation of potential resistance mechanisms
M. HU, G. Schnabel, Clemson University, Clemson, SC, U.S.A.

2:00 p.m. • 85-O

Assessing fitness of *Pythium aphanidermatum* isolates with dual resistance to mefenoxam and fenamidone
E. LOOKABAUGH (1), B. Shew (2), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) NC State University, Raleigh, NC, U.S.A.



Visit the OIP Silent Auction!

Monday, August 7, from 11:30 a.m.–6 p.m.
Exhibit Hall 1

The Office of International Programs (OIP) invites you to this year's auction! Proceeds will support scientists traveling to ICPP 2018 from developing economies. Donate an item to support this exciting event!



WEDNESDAY AFTERNOON, AUGUST 9

All Scientific Sessions take place in the CONVENTION CENTER.

Special Sessions listed first, followed by Oral Technical Sessions. Listed alphabetical by session title.

Find complete details on the meeting website apsnet.org/meet.

As a courtesy to presenters, please DO NOT TAKE PHOTOS during their presentation or of the slide content without presenter approval.

Session content listed in the program is as submitted by the authors/presenter and has NOT been edited.

Special Sessions

Adapt, Change, and Improvise: How to Control Diseases as the Climate Is Changing

1:00 – 4:00 p.m. • Room 221D, Convention Center (live-streamed session)

Organizers: Cassandra L. Swett, University of Maryland, College Park, College Park, MD, U.S.A.; Johanna M. Del Castillo Múnera, University of Maryland, College Park, MD, U.S.A.

Moderator: Ghazal Ebadzadsahrai, Midwestern University, Glendale, AZ, U.S.A.

Section: Epidemiology

Sponsoring Committees: Soil Microbiology and Root Diseases Committee, Crop Loss Assessment and Risk Evaluation Committee

1:00 p.m. • 97-S

Adapting disease forecasting models to climate change scenarios
K. A. GARRETT (1), R. Choudhury (1), K. F. Andersen (2), (1) University of Florida Plant Pathology Department, Gainesville, FL, U.S.A.; (2) Plant Pathology Department, Gainesville, FL, U.S.A.

1:30 p.m. • 98-S

Adapting to water insecurity: Balancing reduced water use with root disease risk
J. M. DEL CASTILLO MUNERA (1,2), B. Belayneh (2), J. Lea-Cox (2), C. L. Swett (3), (1) University of California, Davis, Davis, CA, U.S.A.; (2) University of Maryland, College Park, MD, U.S.A.; (3) Department of Plant Pathology, University of California - Davis, Davis, CA, U.S.A.

2:00 p.m. • 99-S

How changes of annual soil temperature and moisture affect rhizosphere oomycete communities
A. Rojas (1), R. L. Matthiesen (2), A. E. Robertson (3), K. E. Urrea (4), J. C. Rupe (4), M. CHILVERS (5), (1) Duke University, Durham, NC, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.; (3) Iowa State University, Department of Plant Pathology, Ames, IA, U.S.A.; (4) University of Arkansas, Fayetteville, AR, U.S.A.; (5) Michigan State University, East Lansing, MI, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 100-S

Presence of *Ralstonia solanacearum* cold virulent strains in the U.S. and mechanisms of virulence at low temperature
A. M. BOCSANCZY (1), D. J. Norman (2), J. C. Huguet-Tapia (3), A. Mangravita-Novo (1), (1) University of Florida MREC, Apopka, FL, U.S.A.; (2) Univ of Florida MREC, Apopka, FL, U.S.A.; (3) University of Florida, Gainesville, FL, U.S.A.

3:00 p.m. • 101-S

How to use outreach to help farmers adapt to climate change
A. E. ROBERTSON, J. Arbuckle, Jr., Iowa State University, Ames, IA, U.S.A.

Labs, A Mechanism to Enhance Learning in the Changing World of Plant Pathology

1:00 – 2:15 p.m. • Room 221B, Convention Center

Organizer and Moderator: Brad Geary, Brigham Young Univ, Provo, UT, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committees/Sponsor: Teaching Committee, Mycology Committee, Undergraduate Committee, Office of Education

1:00 p.m. • 102-S

Design and teaching of plant pathology and biology labs
D. ROUSE, University of Wisconsin-Madison, Madison, WI, U.S.A.

1:15 p.m. • 103-S

Less Watching, More Doing: Hands-on Activities to Enhance Undergraduate Courses
B. SPAKES RICHTER, University of Florida, Gainesville, FL, U.S.A.

1:30 p.m. • 104-S

Design and delivery of immersive online labs
D. SHEW, A. Koehler, A. Mendoza-Moran, North Carolina State University, Raleigh, NC, U.S.A.

1:45 p.m. • 105-S

Molecular biology-based lab methods using plant nematodes
K. LAMBERT, University of Illinois, Urbana, IL, U.S.A.

2:00 p.m. • Interactive Teaching Demo

New Insights into NLR on Plant Immunity: Pathogen Recognitions, Molecular Interactions, and Novel Disease Control Strategies

1:00 – 4:00 p.m. • Room 221A, Convention Center

Organizers and Moderators: Yulin Jia, USDA ARS, Dale Bumpers National Rice Research Center, Stuttgart, AR, U.S.A.; Zhaohui Liu, North Dakota State University, Fargo, ND, U.S.A.

Section: Molecular and Cellular Plant-Microbe Interactions

Sponsoring Committees: Molecular and Cellular Phytopathology Committee, Host Resistance Committee

1:00 p.m. • 106-S

Distinct E3 ligases regulate the turnover of individual components of paired typical NLR immune receptors
O. Dong (1), F. Xu (1), K. Ao (1), X. LI (2), (1) University of British Columbia, Vancouver, CANADA; (2) University of British Columbia, Vancouver, BC, CANADA

1:30 p.m. • 107-S

Positive and negative regulation of the NLR immune receptor Piz-t in rice

G. L. WANG, The Ohio State University, Columbus, OH, U.S.A.

2:00 p.m. • 108-S

Barley Bait-and-Switch: a receptor kinase bait switches on programmed cell death in response to *Puccinia graminis*

R. S. BRUEGGEMAN, S. Solanki, R. Sharma Poudel, J. Richards, G. Ameen, North Dakota State University, Fargo, ND, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 109-S

An atypical pair Mi-1.2 and SERK1 regulate aphid resistance in tomato

I. KALOSHIAN, University of California, Riverside, CA, U.S.A.

3:15 p.m. • 110-S

Using decoys to expand the recognition specificity of a plant disease resistance protein

M. HELM, R. Innes, Indiana University, Bloomington, IN, U.S.A.

3:45 p.m. • 111-S

Transfer of an NLR gene from pigeonpea into soybean confers resistance to Asian soybean rust

P. VAN ESSE (1), C. Kawashima (1), J. Jones (1), S. Brommonschenkel (2), (1) The Sainsbury Laboratory, Norwich, UNITED KINGDOM; (2) Universidade Federal de Viçosa, Viçosa, BRAZIL

An Ever-Changing Extension Environment: Keeping a Foot in the Furrow and a Hand in Cyberspace

2:45 – 4:00 p.m. • Room 221B, Convention Center

Organizers: Daren S. Mueller, Iowa State University, Ames, IA, U.S.A.; Thomas W. Allen Jr., Mississippi State Univ, Stoneville, MS, U.S.A.

Moderator: Thomas W. Allen Jr., Mississippi State Univ, Stoneville, MS, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committee: Extension Committee

2:45 p.m. • 112-S

Blipity BLOPs: Goals, information, uncertainty, and trust in Extension adoption problems

N. MCROBERTS, University of California-Davis, Davis, CA, U.S.A.

3:15 p.m. • 113-S

Maintaining relevance and impact in food, feed, & fiber security: Opportunities for the Extension service

K. A. EVERSOLE, K. J. Owens, Eversole Associates, Bethesda, MD, U.S.A.

3:30 p.m. • 114-S

Social media outreach with Extension: Where people are succeeding and where they're failing miserably

O. TAYLOR, AgFax, Jackson, MS, U.S.A.

1:00 p.m. Technical Sessions

Floral and Fruit Diseases

1:00 – 2:15 p.m. • Room 221C, Convention Center

Moderators: Olga Kozhar, Washington State University, Pullman, WA, U.S.A.; James J. Polashock, USDA ARS, Chatsworth, NJ, U.S.A.

1:00 p.m. • 86-O

Predicting ascospore release of *Monilinia vaccinii-corymbosi* causing mummy berry of blueberry in the Pacific Northwest using machine learning.

D. HARTEVELD (1), M. Grant (2), J. W. Pscheidt (3), T. L. Peever (4), (1) Washington State University, Mount Vernon, WA, U.S.A.; (2) University of Washington, Seattle, WA, U.S.A.; (3) Oregon State University, Corvallis, OR, U.S.A.; (4) Washington State University, Pullman, WA, U.S.A.

1:15 p.m. • 87-O

Determining the Timing of Host Susceptibility to Infection by Fungal Pathogens Associated with Fruit Rot Disease of Winterberry Holly

S. LIN (1), M. D. Bellizzi (1), F. Peduto Hand PhD (2), (1) The Ohio State University, Columbus, OH, U.S.A.; (2) Ohio State Univ, Dept of Plant Pathology, Columbus, OH, U.S.A.

1:30 p.m. • 88-O

How does *Botrytis cinerea* infect red raspberry?

O. KOZHAR, T. L. Peever, Washington State University, Pullman, WA, U.S.A.

1:45 p.m. • 89-O

Deciphering blueberry and cranberry floral involvement in the disease cycle of *Colletotrichum fioriniae*

T. J. WALLER (1), J. Gager (2), T. Gianfagna (3), P. Oudemans (3), (1) Rutgers University, Chatsworth, NJ, U.S.A.; (2) Rutgers University, Bridgeton, NJ, U.S.A.; (3) Rutgers University, New Brunswick, NJ, U.S.A.

2:00 p.m. • 90-O

Enhancing fruit rot resistance in American cranberry

J. J. POLASHOCK (1), G. Daverdin (2), J. Johnson-Cicalese (2), N. Vorsa (2), (1) USDA ARS, Chatsworth, NJ, U.S.A.; (2) Rutgers University, Chatsworth, NJ, U.S.A.

Virology Detection and Descriptions

1:00 – 2:15 p.m. • Room 225B, Convention Center

Moderators: Lizbeth Pena Zuniga, Oklahoma State University, Stillwater, OK, U.S.A.; Daniel K. Hasegawa, USDA-ARS, Charleston, SC, U.S.A.

1:00 p.m. • 91-O

Investigating the longevity and host range of *Cucumber green mottle mosaic virus* in the Northern Territory, Australia

D. A. LOVELOCK PHD, N. Kurz, S. Mintoff, M. Neilsen, L. T. Tran-Nguyen, Department of Primary Industry and Resources, Darwin, AUSTRALIA

1:15 p.m. • 92-O

Detection of cucurbit viruses in Oklahoma combining EDNA with Multiplex RT-PCR coupled with High Resolution Melting
L. PENA ZUNIGA (1), A. Espindola (1), H. A. Melouk (2), A. Ali (3), K. E. Cardwell (1), F. Ochoa Corona (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) USDA ARS, Stillwater, OK, U.S.A.; (3) Univ of Tulsa, Tulsa, OK, U.S.A.

1:30 p.m. • 93-O

Field status and dynamics of cassava mosaic disease in Zambia
R. M. MULENGA (1), P. C. Chikoti (1), J. P. Legg (2), O. J. Alabi (3), (1) Zambia Agriculture Research Institute, LU.S.A.ka, ZAMBIA; (2) International Institute of Tropical Agriculture, Dar Es Salaam, TANZANIA; (3) Dept. of Plant Pathology & Microbiology, Texas A&M University, Weslaco, TX, U.S.A.

1:45 p.m. • 94-O

Developing RNA interference technology to manage whitefly-transmitted begomoviruses
D. K. HASEGAWA (1), N. Kaur (2), W. Chen (3), Y. Zheng (3), A. Simmons (1), Z. Fei (3), W. M. Wintermantel (2), K. S. Ling (1), (1) USDA-ARS, Charleston, SC, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.; (3) Boyce Thompson Institute, Ithaca, NY, U.S.A.

2:00 p.m. • 95-O

Unveiling the population structure of rose rosette virus
A. Katsiani (1), K. H. Lamour (2), I. E. TZANETAKIS (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Tennessee, Knoxville, TN, U.S.A.

2:45 p.m. Technical Sessions

Chemical Control

2:45 – 4:00 p.m. • Room 221C, Convention Center

Moderators: Stephan Miller, Colorado State University, Fort Collins, CO, U.S.A.; Brent Warneke, Oregon State University, Corvallis, OR, U.S.A.

2:45 p.m. • 96-O

Meta-analysis and yield loss analysis of multiple site-year fungicide evaluations for improved Sclerotinia stem rot management in soybean

J. F. WILLBUR (1), M. L. Fall (2,3), A. Byrne (2), S. Chapman (1), C. A. Bradley PhD (4), M. Chilvers (2), N. M. Kleczewski (5), D. S. Mueller (6), S. Conley (7), D. L. Smith (1,8), (1) University of Wisconsin - Madison, Madison, WI, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.; (3) Agriculture and AgriFood Canada, Saint-Jean-sur-Richelieu, QC, CANADA; (4) University of Kentucky, Princeton, KY, U.S.A.; (5) University of Delaware, Newark, DE, U.S.A.; (6) Iowa State University, Ames, IA, U.S.A.; (7) University of Wisconsin-Madison, Madison, WI, U.S.A.; (8) University of Wisconsin, Madison, WI, U.S.A.

3:00 p.m. • 97-O

Chemical synthesis of Zinc oxide nanoparticle: its application for antimicrobial activity and plant health management
H. KAUSHIK, P. Dutta, Assam Agricultural University, Jorhat, INDIA

3:15 p.m. • 98-O

Reduction in the number of fungicide applications for lettuce downy mildew by timing application based on aerial spore load

N. DHAR (1), A. Ancheta (2), F. N. Martin (2), S. T. Koike (3), K. V. Subbarao (4), S. Klosterman (2), (1) UC Davis, Salinas, CA, U.S.A.; (2) USDA ARS, Salinas, CA, U.S.A.; (3) Univ of California, Salinas, CA, U.S.A.; (4) University of California at Davis, c/o U.S. Agricultural Research Station, Salinas, CA, U.S.A.

3:30 p.m. • 99-O

Chemical options for managing Cytospora canker, a major limiting factor for colorado peach production

S. MILLER (1), K. L. Otto (1), D. Sterle (2), I. Minas (2), J. E. Stewart (1), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) Colorado State University, Grand Junction, CO, U.S.A.

3:45 p.m. • 100-O

The grape powdery mildew conundrum: fungicide selection and timing

B. WARNEKE (1), L. D. Thiessen (2), T. Neill (3), W. Mahaffee (3), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) North Carolina State University, Raleigh, NC, U.S.A.; (3) USDA, Corvallis, OR, U.S.A.

Mycotoxins

2:45 – 4:00 p.m. • Room 225B, Convention Center

Moderators: Lourena R L Arone, University of Arizona, Tucson, AZ, U.S.A.; Eli J. Borrego, Texas A&M University, College Station, TX, U.S.A.

2:45 p.m. • 101-O

Apple post-harvest infection by *Paecilomyces niveus* causes spoilage of thermally processed products

M. DANIELS, A. Synder, R. Worobo, K. T. Hodge, Cornell University, Ithaca, NY, U.S.A.

3:00 p.m. • 102-O

Atoxigenic growth rates and intraspecific aflatoxin inhibition

R. R. SWEANY (1), C. DeRobertis (2), K. E. Damann (3), (1) Louisiana State Univ Ag Center, Baton Rouge, LA, U.S.A.; (2) Louisiana State UniversityAgCenter, Baton Rouge, LA, U.S.A.; (3) Louisiana State University AgCenter, Baton Rouge, LA, U.S.A.

3:15 p.m. • 103-O

Atoxigenic *Aspergillus flavus*: A hidden mechanism of biocontrol

L. R. L. ARONE (1), P. J. Cotty (2), (1) University of Arizona, Tucson, AZ, U.S.A.; (2) USDA-ARS, University of Arizona, Tucson, AZ, U.S.A.

3:30 p.m. • 104-O

Description of a novel aflatoxin-producing *Aspergillus* species from a region of the United States with perennial aflatoxin contamination

P. SINGH (1), P. J. Cotty (2), (1) University of Arizona, Tucson, AZ, U.S.A.; (2) USDA-ARS, University of Arizona, Tucson, AZ, U.S.A.

3:45 p.m. • 105-O

Colonization, conidiation, and aflatoxin contamination of maize seed by *Aspergillus flavus* requires oxylipins from both host and pathogen

E. J. BORREGO, M. V. Kolomiets, Texas A&M University, College Station, TX, U.S.A.

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Poster content listed in the program is as submitted by the authors/presenter and has NOT been edited.

Posters by Appointment allows meeting attendees to connect with poster authors, by use of the mobile app, to make appointments to meet and discuss poster content (in addition to the poster author time).

POSTER VIEWING HOURS

***Poster huddles are subject to change**

Sunday, August 6

12:00 – 2:00 p.m. Poster Set-Up
4:00 – 6:00 p.m. Poster Viewing

Monday, August 7

8:00 a.m. – 6:00 p.m. Poster Viewing
2:30 – 3:00 p.m. Poster Huddles*
HUDDLE #1 – Strategies for managing diseases caused by microsclerotia-producing fungi
Moderator: Debra Inglis
HUDDLE #2 – Challenges to developing effective strategies for managing emerging plant diseases
Moderators: Randy Ploetz and Akif Eskalen
HUDDLE #3 – Innovative approaches for plant disease management
Moderators: James Stack, Megan McCaghey, and Chellappan Padmanabhan
3:00 – 5:00 p.m. Poster Viewing with Authors Present
If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.
3:00 – 4:00 p.m. Posters 1 – 320 (even-numbered posters)
4:00 – 5:00 p.m. Posters 321 – 645 (even-numbered posters)

Tuesday, August 8

8:00 a.m. – 6:00 p.m. Poster Viewing
2:30 – 3:00 p.m. Poster Huddles*
HUDDLE #4 – Pathogenicity and virulence determinants of soilborne fungal pathogens
Moderator: Kishore Chittem
HUDDLE #5 – Novel approaches for screening for plant disease resistance
Moderators: Krishna Subbarao and Deborah Samac
HUDDLE #6 – Advances in phytobiome research
Moderators: Erica Goss and Timothy Paulitz
3:00 – 5:00 p.m. Poster Viewing with Authors Present
If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.
3:00 – 4:00 p.m. Posters 1 – 320 (odd-numbered posters)
4:00 – 5:00 p.m. Posters 321 – 645 (odd-numbered posters)

Wednesday, August 9

8:30 – 10:00 p.m. Poster Viewing
9:00 – 9:30 a.m. Poster Huddles*
HUDDLE #7 – Pros & cons of pathogen detection strategies
Moderator: Caterina Villari and Roland Willmann
HUDDLE #8 – Improved understanding of pathogen dispersal/dissemination
Moderator: Kathy Kosta
HUDDLE #9 – Advances in understanding fungicide resistance
Moderator: Katherine Stevenson
10:30 – 11:00 a.m. Poster Take-Down

***Poster Huddles are small groupings of posters and the poster authors** that focus on special areas of interest among the submitted posters, offering more in-depth discussion of research and findings.

POSTER CATEGORIES

Taking photographs of poster content is strictly prohibited without permission of the author(s).

Poster Categories	Poster Numbers	Poster Categories	Poster Numbers
Abiotic Interactions	1-23	Nematology	402-406
Bacteriology	24-32	New and Emerging Diseases	407-444
Biochemistry and Cell Biology	33-44	Oomycetes	445-454
Biological Control	45-72	Outreach and Engagement	455-462
Chemical Control	73-127	Pathogen Dispersal	463-481
Crop Loss Assessment	128-135	Pathogen-Vector Interactions	482-489
Cultural Control	136-165	Pathogenicity and Host Specificity	490-510
Disease Detection and Diagnosis	166-220	Phytophagians	511-519
Fungicide Resistance	221-235	Plant Defense Responses	520-532
Genetics of Resistance	236-272	Population Biology Genetics	533-569
Host Resistance Screening	273-292	Postharvest Pathology and Mycotoxins	570-590
Integrated Pest Management	293-308	Proteomics/Metabolomics/Genomics	591-615
Molecular Plant-Microbe Interactions	309-385	Virology	616-642
Mycology	386-401		

Abiotic Interactions

- 1-P The effect of cold stress on damping-off of soybean caused by *Pythium sylvaticum***
M. SERRANO, A. E. Robertson. Iowa State University, Ames, IA, USA
- 2-P Bioprospecting rhizobacteria to improve drought resistance in grasses**
M. JOCHUM (1), S. P. Gaire (1), G. Niu (2), Y. K. Jo (1). (1) Texas A&M University, College Station, TX, USA; (2) Texas A&M University, Agricultural Research and Extension Center, El Paso, TX, USA
- 3-P Over-wintering soil microbial communities in corn/soybean rotation fields in Indiana**
G. CAI (1), S. Brittsan (2), G. Nowling (2). (1) USDA-ARS/Purdue University, West Lafayette, IN, USA; (2) USDA-ARS, West Lafayette, IN, USA
- 4-P Influence of biotic and abiotic factors on common scab severity and pathogenic *Streptomyces* spp. populations in agricultural fields**
C. GOYER (1), S. Neupane (1), S. Whitney (1), B. Zebarth (1), M. Chantigny (2), D. Burton (3). (1) Agriculture and Agri-Food Canada, Fredericton, NB, CANADA; (2) Agriculture and Agri-Food Canada, Quebec, QC, CANADA; (3) Dalhousie University, Truro, NS, CANADA
- 5-P A greenhouse system to study the effect of soil pH on *Fusarium* wilt of tomato caused by *Fusarium oxysporum* f. sp. *lycopersici* race 3**
C. J. LAND (1), H. Adkison (2), R. Willis (1), G. E. Vallad (2). (1) University of Florida, Wimauma, FL, USA; (2) University of Florida, Gulf Coast Research and Education Center, Wimauma, FL, USA
- 6-P Rice plants exhibiting bacterial blight resistance at high temperature suppress abiotic response**
S. COHEN (1), H. Liu (2), C. Argueso (1), C. M. Vera Cruz (3), V. M. Verdier (4), J. E. Leach (1). (1) Colorado State University, Fort Collins, CO, USA; (2) Institute of Crop Sciences, Chinese Academy of Agricultural Sciences,

Beijing, CHINA; (3) International Rice Research Institute, Los Baños, Laguna, PHILIPPINES; (4) IRD, Cirad, University of Montpellier, IPME, Montpellier, FRANCE

- 7-P Growth of legume species under variable zinc regimes and different mycorrhizal fungi**
M. L. PAWLOWSKI (1), G. L. Hartman (2). (1) University of Illinois-Urbana Champaign, Urbana, IL, USA; (2) USDA-ARS at the University of Illinois, Urbana, IL, USA
- 8-P Ecology and epidemiology of *Helminthosporium solani* and *Colletotrichum coccodes* on potato in the San Luis Valley of Colorado**
F. J. LICHTNER, K. D. Broders. Colorado State University, Fort Collins, CO, USA
- 9-P Effects of N-P-K fertilizer rates on the interaction between *Fusarium virguliforme* and soybean cyst nematode on soybean**
P. OKELLO (1), S. Osborne (2), F. M. Mathew (1). (1) South Dakota State University, Brookings, SD, USA; (2) USDA ARS, Brookings, SD, USA
- 10-P Variation in phenylpropanoid intermediates associated with adaptation to abiotic stress in the perennial tree species *Prunus persica* and *P. armeniaca***
A. O. CONRAD (1), T. Zhebentyayeva (2), M. Staton (3), J. M. Audergon (4), V. Decroocq (5), Z. Liu (6), C. D. Dardick (7), C. D. Nelson (8), A. Abbott (1). (1) University of Kentucky, Lexington, KY, USA; (2) Clemson University, Clemson, SC, USA; (3) University of Tennessee, Knoxville, TN, USA; (4) INRA, Avignon, FRANCE; (5) INRA, Bordeaux, FRANCE; (6) USDA ARS, Kearneysville, WV, USA; (7) Appalachian Fruit Research Station, USDA ARS, Kearneysville, WV, USA; (8) USDA-Forest Service, Southern Research Station, Lexington, KY, USA
- 11-P Effect of moisture at physiological maturity on soybean seed infection by *Phomopsis longicolla* and *Cercospora flagellaris***
J. C. RUPE, R. Holland, A. Steger. University of Arkansas, Fayetteville, AR, USA

- 12-P An intriguing taste of 30 years of coevolution: Monitoring coffee leaf rust (*Hemileia vastatrix* Berk. & Br.) in Colombia**
C. A. ANGEL (1), M. Cristancho (1,2), A. Jaramillo (1), A. L. Gaitan (1). (1) CENICAFE, Colombia, Manizales, COLOMBIA; (2) Bioinformatics and Computational Biology of Colombia –BIOS, Manizales, COLOMBIA
- 13-P Identifying the most efficient agroecosystems for potato production in Nariño, Colombia**
P. URIBE, C. A. Benavides, D. Calvache. Corporación Colombiana de Investigación Agropecuaria, Pasto, COLOMBIA
- 14-P Use of the disease severity index for null hypothesis testing**
K. S. P. CHIANG (1), C. H. Bock (2). (1) Division of Biometrics, Department of Agronomy, National Chung Hsing University, Taichung, TAIWAN; (2) USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA
- 15-P Spline regression providing the area under the sensitivity curve as an alternative for the EC₅₀ values on fungicide resistance studies**
P. D. S. F. LICHTENBERG (1), W. Zeviani (2), T. J. Michailides (1). (1) University of California-Davis, Parlier, CA, USA; (2) Universidade Federal do Paraná, Curitiba, BRAZIL
- 16-P Validation of a Florida strawberry anthracnose fruit rot (AFR) warning system in Iowa**
X. ZHANG (1), J. C. Batzer (1), X. Li (1), N. Peres (2), M. L. Gleason (1). (1) Iowa State University, Ames, IA, USA; (2) Gulf Coast Research and Education Center; University of Florida, Wimauma, FL, USA
- 17-P Impact network analysis of avocado laurel wilt disease**
R. CHOUDHURY (1,2,3), J. H. Crane (4), D. Carrillo (4), E. Evans (4), J. Wasielewski (5), R. C. Ploetz (4), K. A. Garrett (1,2,3). (1) University of Florida, Plant Pathology Department, Gainesville, FL, USA; (2) Institute for Sustainable Food Systems, Gainesville, FL, USA; (3) Emerging Pathogens Institute, Gainesville, FL, USA; (4) University of Florida, Tropical Research and Education Center, Homestead, FL, USA; (5) University of Florida, IFAS Extension, Homestead, FL, USA
- 18-P A Meta-analysis of maize yield response to azoxystrobin and propiconazole as influenced by foliar disease intensity and application timing**
F. DALLA LANA (1), A. E. Robertson (2), C. A. Bradley (3), D. L. Smith (4), D. A. Shah (5), K. A. Wise (6), L. V. Madden (7), P. Esker (8), S. Conley (9), P. A. Paul (7). (1) Ohio State University, Wooster, OH, USA; (2) Iowa State University, Department of Plant Pathology, Ames, IA, USA; (3) University of Kentucky, Princeton, KY, USA; (4) University of Wisconsin, Madison, WI, USA; (5) Kansas State University, Manhattan, KS, USA; (6) Purdue University, West Lafayette, IN, USA; (7) Ohio State University, Ohio Agricultural Research and Development Center, Department of Plant Pathology, Wooster, OH, USA; (8) University de Costa Rica, San Jose, COSTA RICA; (9) Purdue University, West Lafayette, IN, USA
- 19-P “I heard it through the grapevine”: Assessing effects of information diffusion on disease recognition and response within the Florida pepper industry**
J. FULTON (1), C. Lapaire Harmon (2), S. Turner (1), K. A. Garrett (3). (1) University of Florida, Gainesville, FL, USA; (2) University of Florida PDC, Gainesville, FL, USA; (3) Plant Pathology Department, University of Florida, Gainesville, FL, USA
- 20-P Validation of models for predicting the daily infection risk of cucurbit host types by *Pseudoperonospora cubensis***
K. N. NEUFELD (1), A. P. Keinath (2), P. Ojiambo (1). (1) North Carolina State University, Raleigh, NC, USA; (2) Coastal Research and Education Center, Clemson University, Charleston, SC, USA
- 21-P Climatic variables related to the development of peanut foliar pathogens**
W. ELWAKIL, R. Barocco, N. S. Dufault. University of Florida, Gainesville, FL, USA
- 22-P Meta-analysis of a web-based disease forecast system for control of anthracnose and Botrytis fruit rots of strawberry in southeastern United States**
L. CORDOVA (1), L. V. Madden (2), A. Amiri (3), G. Schnabel (4), N. Peres (5). (1) University of Florida, Wimauma, FL, USA; (2) Ohio State University, Ohio Agricultural Research and Development Center, Department of Plant Pathology, Wooster, OH, USA; (3) Washington State University, Wenatchee, WA, USA; (4) Clemson University, Clemson, SC, USA; (5) Gulf Coast Research and Education Center; University of Florida, Wimauma, FL, USA
- 23-P Development and deployment of a strawberry disease advisory system in North Carolina**
F. LOUWS (1), R. Mahfuz (2), G. Buol (1), G. Wilkerson (1), R. Boyles (3). (1) North Carolina State University, Raleigh, NC, USA; (2) West Virginia University, Morgantown, WV, USA; (3) SE Climate Science Center, Raleigh, NC, USA

Bacteriology

- 24-P Hok/Sok toxin-antitoxin system in *Erwinia amylovora*: “To be, or not to be”**
J. PENG, G. W. Sundin. Michigan State University, East Lansing, MI, USA
- 25-P Identification of bacterial leaf spot disease caused by *Xanthomonas campestris* pv. *vitiensis* on lettuce in Taiwan**
W. L. DENG (1,2), Y. C. Huang (2), J. Y. Tzeng (2). (1) Agricultural Biotechnology Center, Taichung, TAIWAN; (2) National Chung Hsing University, Taichung, TAIWAN
- 26-P Occurrence of pepper stem black spot disease caused by *Pectobacterium carotovorum* subsp. *brasiliense* in Guangdong of China**
X. SHE, Z. He, Y. Tang, L. Yu. Plant Protection Research Institute, Guangdong Academy of Agricultural Sciences, Guangzhou, CHINA

27-P First report of phytoplasmas subgroups 16SrIII-B, 16SrIII-J and 16SrVII-B in *Brassica rapa*, a weed species present in brassica crops in Brazil
T. BANZATO (1), I. Bedendo (2). (1) Universidade de São Paulo, Piracicaba, BRAZIL; (2) ESALQ-USP, Piracicaba, BRAZIL

28-P Survey of the natural infection by *Erwinia amylovora* in Korea
C. S. OH (1), D. H. Park (2). (1) Kyung Hee University, Yongin, KOREA; (2) Kangwon National University, Chuncheon, KOREA

29-P Induction and resuscitation of viable but nonculturable (VBNC) state in *Acidovorax citrulli*
Y. KAN, K. Bai, Q. Lv, N. Jiang, L. Luo, J. Li. China Agricultural University, Beijing, CHINA

30-P Role of spring cankers in bacterial spot epidemics of peach in North Carolina
D. F. RITCHIE. North Carolina State University, Raleigh, NC, USA

31-P Identification and characterization of *Pantoea ananatis* as a cause of etiolation on perennial ryegrass
G. Z. Achenef, J. A. ROBERTS. University of Maryland, College Park, MD, USA

32-P Phytoplasma survey in Pennsylvania
E. V. NIKOLAEVA (1), K. A. Peter (2), J. Lesperance (1), T. Jones (3), S. Costanzo (4), R. E. Davis (5). (1) Pennsylvania Department of Agriculture, Harrisburg, PA, USA; (2) Pennsylvania State University, Biglerville, PA, USA; (3) Pennsylvania State University, Harrisburg, PA, USA; (4) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (5) USDA ARS Molecular Plant Pathology Lab, Beltsville, MD, USA

Biochemistry and Cell Biology

33-P Impact of *Macrophomina phaseolina* infection on plastid- and cell-membrane integrity and lipid based signaling capacity of sorghum stalk tissues
A. Y. BANDARA, S. Liu, C. R. Little. Kansas State University, Manhattan, KS, USA

34-P *Macrophomina phaseolina* infection down-regulates phytosterol biosynthesis in stalk tissues of a charcoal rot-susceptible sorghum genotype
A. Y. BANDARA, S. Liu, C. R. Little. Kansas State University, Manhattan, KS, USA

35-P Genetics underlying intra-species antagonism in *Pseudomonas syringae* and the potential for bacterial pathogen control
K. HOCKETT. Pennsylvania State University, University Park, PA, USA

36-P Whole genome sequences reveal polymorphisms in bacteriocin genes of *Xanthomonas perforans* in Florida
J. KLEIN (1), S. Timilsina (1), P. Abrahamian (2), G. V. Minsavage Jr. (1), N. Potnis (3), J. B. Jones (1), G. E. Vallad (2), E. M. Goss (1). (1) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (2) Gulf Coast

Research and Education Center, University of Florida, Wimauma, FL, USA; (3) Department of Entomology and Plant Pathology, Auburn University, Auburn, AL, USA

37-P The interplay between apoptosis and autophagy in the pathogenicity of *Sclerotinia sclerotiorum*
Y. LI, M. B. Dickman. Texas A&M University, College Station, TX, USA

38-P Plasmid transfer by conjugation in *Xylella fastidiosa*
L. BURBANK, D. C. Stenger. USDA-ARS, Parlier, CA, USA

39-P Antimicrobial activities of cationic antimicrobial peptides immobilized on plant virus-like particles
R. W. HAMMOND (1), N. Kovalskaya (1), N. Kreger (1), J. Mowery (2), C. Gulbranson (2), J. Hammond (3). (1) USDA ARS Molecular Plant Pathology Laboratory, Beltsville, MD, USA; (2) USDA ARS Electron and Confocal Microscopy Unit, Beltsville, MD, USA; (3) USDA ARS Floral and Nursery Plant Research Laboratory, Beltsville, MD, USA

40-P Characterization of bacterial endophytes and their applications
C. MEI (1,2), R. Chretien (1), S. Yan (1), J. Carey (1), Y. He (1), S. Lowman (1,2). (1) Institute for Advanced Learning and Research, Danville, VA, USA; (2) Department of Horticulture, Virginia Tech, Blacksburg, VA, USA

41-P TOR signaling pathway regulates lipid droplets biosynthesis in *Fusarium graminearum*
N. LIU, Z. Ma, L. Xu. Institute of Biotechnology, Zhejiang University, Hangzhou, CHINA

42-P Unraveling the cyclic-di-GMP mediated transcriptional regulation of amylovan production in *Erwinia amylovora*
R. R. KHARADI, G. W. Sundin. Michigan State University, East Lansing, MI, USA

43-P Binding properties of cercosporin and their role in symptoms of Cercospora leaf blight in soybean
B. WARD (1), C. L. Robertson (1), P. Abhayawardhana (1), M. Macnaughtan (2), R. W. Schneider (2). (1) Louisiana State University Agricultural Center, Baton Rouge, LA, USA; (2) Louisiana State University, Baton Rouge, LA, USA

44-P Epiphyllous growth and conidiation of *Hordeum* spp. endophytes and the conidial dissemination potential
M. YI, C. A. Young. The Samuel Roberts Noble Foundation, Ardmore, OK, USA

Biological Control

45-P Potential to manage date palm black scorch disease in the United Arab Emirates using a resident actinomycete isolate
K. A. EL-TARABILY, S. Abuqamar, E. E. Saeed, Z. Salmin. United Arab Emirates University, Al-Ain, UNITED ARAB EMIRATES

46-P Biological control of root and stem rot of soybean caused by *Rhizoctonia solani* using chitinolytic and ACC deaminase producing yeasts

K. A. EL-TARABILY, S. Abuqamar, A. Alkhajeh. United Arab Emirates University, Al-Ain, UNITED ARAB EMIRATES

- 47-P **Biological control of *Agrobacterium rhizogenes* using *Pseudomonas* strains**
C. CHAGAS DE FREITAS, C. G. Taylor. The Ohio State University, Wooster, OH, USA
- 48-P **An *in vitro* study of the inhibitory effect of *Pseudomonas* spp. on important greenhouse ornamental pathogens**
D. E. MARTIN (1), C. G. Taylor (2), F. Peduto Hand (3). (1) The Ohio State University, Columbus, OH, USA; (2) The Ohio State University, Wooster, OH, USA; (3) The Ohio State University, Department of Plant Pathology, Columbus, OH, USA
- 49-P **Biological control of *Fusarium* root rot on row crops in the Great Plains using PGPR and *Trichoderma* species**
L. P. PARIKH, M. Eskelson, A. O. Adesemoye. University of Nebraska-Lincoln, North Platte, NE, USA
- 50-P **Variation in endophytic and epiphytic bacteria populations isolated from cultivated small grains**
F. CRUTCHER, S. Hoesel. Montana State University, Sidney, MT, USA
- 51-P **Effect of Contans WG and burial of sclerotia on survival of sclerotia of *Sclerotinia sclerotiorum* in the Columbia Basin of central Washington**
J. Weber, L. DU TOIT. Washington State University, Mount Vernon, WA, USA
- 52-P **Prospective endophyte antagonists of *Verticillium dahliae* isolated from three field-grown cucurbit cultivars in western Washington**
L. TYMON, P. Morgan, D. A. Inglis. Washington State University-NWREC, Mount Vernon, WA, USA
- 53-P **Identification of bioactive secondary metabolites from a *Bacillus amyloliquefaciens* strain for control of fungal plant pathogens**
T. Qu (1), Y. Yin (2), L. Xiao (2), S. TIAN (1), P. Ji (1). (1) University of Georgia, Tifton, GA, USA; (2) Qingdao Agricultural University, Qingdao, CHINA
- 54-P **Screening mycotoxins for quorum inhibition in a biocontrol bacterial endophyte**
C. W. BACON (1), D. Hinton (2). (1) USDA ARS, Athens, GA, USA; (2) Richard Russell Research Center, Athens, GA, USA
- 55-P **Biological control of aflatoxins in maize and groundnut through use of Aflasafe products developed for Ghana**
D. Agbetiameh (1,2), A. ORTEGA-BELTRAN (1), R. Awuah (2), J. Atehnkeng (3), P. J. Cotty (4), R. Bandyopadhyay (1). (1) International Institute of Tropical Agriculture, Ibadan, NIGERIA; (2) Kwame Nkrumah University of Science and Technology, Kumasi, GHANA; (3) International Institute of Tropical Agriculture, Lilongwe, MALAWI; (4) USDA-ARS, University of Arizona, Tucson, AZ, USA
- 56-P **Antagonistic potential of biocontrol bacteria against *Sclerotinia sclerotiorum* causing lettuce drop**
A. D. SANABRIA, C. G. Taylor, S. A. Miller. The Ohio State University, Wooster, OH, USA
- 57-P **Serenade ASO: A sustainable agricultural solution providing multiple modes of action against bacterial pathogens**
M. IOTT. Bayer, West Sacramento, CA, USA
- 58-P **Effects of seed treatment with biocontrol agents and gibberellic acid on seedling disease, plant growth, yield, and quality in organic rice**
X. ZHOU. Texas A&M University AgriLife Research, Beaumont, TX, USA
- 59-P **Evaluation of the antagonistic activity of native *Trichoderma* isolates from Texas citrus orchards against *Phytophthora nicotianae***
M. GURUNG (1), F. Gurung (1), C. Simpson (1), J. L. Hernandez (2), V. Ancona (1). (1) Texas A&M Kingsville, Citrus Center, Weslaco, TX, USA; (2) Instituto Politecnico Nacional Centro de Biotecnología Genómica, Reynosa, MEXICO
- 60-P **Characterization of the interaction between biological control agent ZJU60 and *Fusarium graminearum***
J. WANG, Y. Chen, N. Yang, Z. Ma. Institute of Biotechnology, Zhejiang University, Hangzhou, CHINA
- 61-P **Biological seed treatments for soybean cyst nematode (*Heterodera glycines*) management**
W. ALJAAFRI (1), G. W. Lawrence (2), V. Klink (2), S. Lu (2), D. Long (3), K. S. Lawrence (4). (1) Mississippi State University, Starkville, MS, USA; (2) Mississippi State University, Mississippi State, MS, USA; (3) Albaugh, LLC, Olive Branch, MS, USA; (4) Auburn University, Auburn, AL, USA
- 62-P **Field-testing potential biological control agents for enhanced *Fusarium* head blight mitigation**
A. L. BEHARI, G. Kulda. Pennsylvania State University, University Park, PA, USA
- 63-P ***Paecilomyces lilacinus* in *Nacobbus aberrans* control in tomato cv. San Marzano**
R. GARCIA-VELASCO, E. A. Chavarro-Carrero. Universidad Autónoma del Estado de México, Tenancingo, MEXICO
- 64-P **New products for managing lesion nematode on Easter lilies**
B. B. WESTERDAHL (1), D. D. Giraud (2). (1) University of California-Davis, Davis, CA, USA; (2) University of California, Eureka, CA, USA
- 65-P **Potential of native yeasts from Washington vineyards as biocontrol agents against *Botrytis* bunch rot of grape**
X. WANG (1), E. Kramer (1), D. A. Glawe (1), T. D. Murray (1), D. M. Weller (2), P. A. Okubara (2). (1) Washington State University, Pullman, WA, USA; (2) USDA-ARS Wheat Health, Genetics and Quality Research Unit, Pullman, WA, USA
- 66-P **Thermo-stability, dose effects, and shelf-life of antifungal compounds produced by the symbiotic bacterium *Xenorhabdus szentirmai***

S. Hazir (1), D. I. Shapiro-Ilan (2), C. H. BOCK (2), L. G. Leite (3). (1) Faculty of Arts and Sciences, Department of Biology, Adnan Menderes University, Aydin, TURKEY; (2) USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA; (3) Instituto Biológico, APTA, Campinas, BRAZIL

67-P Characterization of an *Aspergillus flavus* population from Argentina and its potential use as biocontrol agents for mycotoxins in maize

B. X. Camiletti (1), J. Moral (2), A. K. Torrico (3), C. M. Asensio (1), M. D. L. P. Giménez Pecci (3), E. I. Lucini (1), T. J. MICHAILIDES (4). (1) Universidad Nacional de Córdoba, Córdoba, ARGENTINA; (2) Universidad De Cordoba/University of California-Davis, Parlier, CA, USA; (3) Instituto Nacional de Tecnología Agropecuaria, Córdoba, ARGENTINA; (4) University of California-Davis, Parlier, CA, USA

68-P Sensitivity of biocontrol agents to common soybean seed treatment fungicide active ingredients

J. V. LACEY (1), A. Kachroo (1), A. M. Fakhoury (2), C. A. Bradley (3). (1) University of Kentucky, Lexington, KY, USA; (2) Southern Illinois University, Carbondale, IL, USA; (3) University of Kentucky, Princeton, KY, USA

69-P Integration and biological effect of the filamentous phage ϕ R551 on its *Ralstonia solanacearum* host

A. A. AHMAD (1,2), Q. Huang (1). (1) FNPRU, U.S. National Arboretum, USDA ARS, Beltsville, MD, USA; (2) Minia University, El-Minia, EGYPT

70-P Controlling soilborne pathogens by use of biologicals

B. ESPEJO (1), E. Gachango (1), M. Twizeyimana (2), S. Ronyak (1), K. Tyson (1), K. Craig (1), P. E. Hammer (1). (1) AgBiome, Inc., Research Triangle Park, NC, USA; (2) AgBiome Inc., Durham, NC, USA

71-P Differential antibiosis of hydrolytic enzymes and metabolites by Paraguayan isolates of *Trichoderma* spp. against *Macrophomina phaseolina*

F. A. Villalba Silvero (1), A. D. SANABRIA (2), M. E. Flores-Giubi (1), J. E. Barua (1). (1) Universidad Nacional de Asuncion, Central, PARAGUAY; (2) Paraguayan Institute of Agrarian Technology (IPTA), Central, PARAGUAY

72-P Serenade®: Research advances in soil performance of the biological fungicidal/bactericidal product

S. HOVINGA. Bayer Crop Science, West Sacramento, CA, USA

Chemical Control

73-P Metabolomic-based elucidation of fungicide-microbe interactions in banana and potato fungal pathogens

J. Cevallos-Cevallos, M. G. MARIDUENA-ZAVALA, A. Freire-Penaherrera, D. Ochoa. Escuela Superior Politécnica del Litoral, ESPOL, Guayaquil, ECUADOR

74-P Preserving efficacy of new FRAC group from resistance development in impatiens downy mildew

S. N. SUAREZ (1), P. Lopez (1), A. R. Chase Zemke (2), A. J. Palmateer (3). (1) University of Florida, Homestead,

FL, USA; (2) Chase Agricultural Consulting, Cottonwood, AZ, USA; (3) Bayer Environmental Science, Homestead, FL, USA

75-P Blossom application of novel silver compounds for fire blight (*Erwinia amylovora*) management in apples

C. NISCHWITZ (1), M. W. Harding (2), E. Petrizzo (1), P. Nadworny (3). (1) Utah State University, Logan, UT, USA; (2) Alberta Agriculture and Forestry, Crop Diversification Center South, Brooks, AB, CANADA; (3) Innovotech, Inc., Edmonton, AB, CANADA

76-P Fungicides and biological controls for the management of Septoria leaf spot on stevia

A. KOEHLER, D. Shew. North Carolina State University, Raleigh, NC, USA

77-P Management of laurel wilt of avocado, caused by *Raffaelea lauricola*

R. C. PLOETZ (1), J. Konkol (2), J. Pérez-Martínez (3). (1) University of Florida, Tropical Research and Education Center, Homestead, FL, USA; (2) University of Florida, Homestead, FL, USA; (3) University of Florida/University of Frankfurt, Homestead, FL, USA

78-P Managing *Helminthosporium solani*, causal agent of silver scurf in Wisconsin potatoes

S. MACCHIAVELLI GIRÓN, S. A. Jordan, J. M. Crane, A. J. Gevens. University of Wisconsin-Madison, Madison, WI, USA

79-P Developing post-harvest fungicides for sugarbeet

N. GLYNN (1), P. J. Kuhn (2), D. Ruppel (3). (1) Syngenta, Vero Beach, FL, USA; (2) Syngenta Crop Protection, Greensboro, NC, USA; (3) Syngenta Seeds, Akron, MI, USA

80-P Correlation between fungicide sensitivity of *Phakopsora pachyrhizi* and *Puccinia triticina* under greenhouse conditions

C. AVILA-ADAME, C. J. Klittich, G. Gustafson. Dow AgroSciences LLC, Indianapolis, IN, USA

81-P Sensitivity of sugarcane orange rust (*Puccinia kuehnii*) to fungicides in spore germination and detached leaf bioassays

B. CHAULAGAIN (1), M. Hincapie (1), S. Sanjel (1), N. S. Dufault (2), R. N. Raid (1), P. C. Rott (1). (1) University of Florida, Belle Glade, FL, USA; (2) University of Florida, Gainesville, FL, USA

82-P Evaluation of fungicides for control of *Ceratocystis fimbriata* causing black rot on sweetpotato

H. COLLINS, L. M. Quesada. North Carolina State University, Raleigh, NC, USA

83-P Variation in sensitivity to DMI fungicides tebuconazole and prothioconazole in *Blumeria graminis* f. sp. *tritici*

E. A. MEYERS (1), R. Whetten (2), C. Cowger (3). (1) Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC, USA; (2) USDA-ARS Plant Science Unit, Raleigh, NC, USA; (3) USDA-ARS, Department of Entomology & Plant Pathology, North Carolina State University, Raleigh, NC, USA

- 84-P Saponins in chenopods and potential for control of nematodes**
K. GWINN (1), E. Batson (2), T. Kouser (2), M. M. Dee (1). (1) University of Tennessee, Department of Entomology and Plant Pathology, Knoxville, TN, USA; (2) University of Tennessee, Knoxville, TN, USA
- 85-P Investigating chemical control options for *Colletotrichum dieback* of clementine in California**
J. S. MAYORQUIN (1), J. D. Carrillo (1), B. B. Peacock (1), K. Moreno (2), L. P. Torres (1), A. Eskalen (1). (1) University of California-Riverside, Riverside, CA, USA; (2) Department of Plant Pathology and Microbiology, University of California-Riverside, Riverside, CA, USA
- 86-P In vitro evaluation of efficacy of novel antifungal compounds for control of the rice sheath blight fungus**
Z. GUO (1), X. Zhou (1), B. Liu (2), X. Lei (3). (1) Texas A&M University, AgriLife Research, Beaumont, TX, USA; (2) Hunan Agricultural University, Changsha, CHINA; (3) Lamar University, Beaumont, TX, USA
- 87-P The influence of water quality on efficacy of fungicides for turf disease control**
T. STACY, R. Latin. Purdue University, West Lafayette, IN, USA
- 88-P *Calonectria pseudonaviculata* microsclerotia viability after exposure to fungicides**
J. A. LAMONDIA, K. Maurer. Connecticut Agricultural Experiment Station, Windsor, CT, USA
- 89-P Efficacy of SDHI fungicide, pydiflumetofen, against *Fusarium graminearum***
H. SUN, W. Li, Y. Deng, A. Zhang, H. Chen. Jiangsu Academy of Agricultural Sciences, Nanjing, CHINA
- 90-P Protection of new cucumber growth from *Pseudoperonospora cubensis* with oxathiapiprolin-based fungicides**
S. E. SALAS, C. P. Shepherd, H. K. Ngugi. DuPont Crop Protection, Newark, DE, USA
- 91-P Partitioning and local systemic movement of oxathiapiprolin for protection of potato against *Phytophthora infestans***
H. K. Ngugi, S. E. SALAS, C. P. Shepherd, L. J. Watson. DuPont Crop Protection, Newark, DE, USA
- 92-P Efficacy of copper hydroxide on four clonal lineages of *Phytophthora infestans***
T. WU, E. Silva, A. J. Gevens. University of Wisconsin-Madison, Madison, WI, USA
- 93-P WITHDRAWN**
- 94-P Efficacy of seed treatment fungicides on frequently isolated seedborne fungi of pulse crops in Montana**
C. PELUOLA, J. Mgbechi-Ezeri, A. Owati, M. E. Burrows, B. Agindotan. Montana State University, Bozeman, MT, USA
- 95-P Nematicidal effects of absinth wormwood (*Artemisia absinthium*) against soybean cyst nematode in in-vitro and in-vivo conditions**
P. BASNET, E. Z. Byamukama. South Dakota State University, Brookings, SD, USA
- 96-P A comparison of ground-based air-blast sprayer and aircraft application of fungicides to manage scab in tall pecan trees**
C. H. Bock (1), M. W. HOTCHKISS (2). (1) USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA; (2) USDA ARS, Byron, GA, USA
- 97-P Physiological effects and mode of action of ZnO nanoparticles against postharvest fungal contaminants**
D. SARDELLA, R. Gatt, V. Valdramidis. University of Malta, Msida, MALTA
- 98-P Fungicide dip treatment of strawberry transplants as management of *Botrytis cinerea* resistant isolates**
M. OLIVEIRA (1), L. Cordova (1), M. Marin (1), N. Peres (2). (1) University of Florida, Wimauma, FL, USA; (2) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA
- 99-P Effect of fungicide seed treatment and temperature on cotton stand establishment in soils with different cropping histories**
S. YOUNG (1), J. E. Woodward (2). (1) Texas Tech University, Lubbock, TX, USA; (2) Texas A&M University, AgriLife Extension Service, Lubbock, TX, USA
- 100-P Influence of fungicides on gas exchange of pecan foliage**
B. W. Wood, C. H. BOCK. USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA
- 101-P New fungicides for management of avocado root rot in California**
R. J. Belisle, W. Hao, B. McKee, P. Manosalva, J. E. ADASKAVEG. Department of Plant Pathology and Microbiology, University of California, Riverside, CA, USA
- 102-P Magnesium oxide nanomaterial, a novel bactericide for control of bacterial spot of tomato without accumulating in fruit**
Y. Y. LIAO (1), A. L. Strayer (1), J. C. White (2), A. Mukherjee (2), R. De La Torre-Roche (2), W. H. Elmer (2), M. Young (3), S. Santra (3), L. Ritchie (4), J. H. Freeman (4), J. B. Jones (5), M. Paret (6). (1) University of Florida, Department of Plant Pathology, Gainesville, FL, USA; (2) Connecticut Agricultural Experiment Station, New Haven, CT, USA; (3) University of Central Florida, Orlando, FL, USA; (4) University of Florida, Quincy, FL, USA; (5) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (6) North Florida Research and Education Center, University of Florida, Quincy, FL, USA
- 103-P Evaluation of new fungicides against *Fusarium oxysporum* causing wilt in strawberry**
A. HANNAN (1,2), S. Atta (2), T. Akhtar (3), I. Ahmad (3), M. Atiq (3). (1) University of Florida, Gainesville, FL, USA; (2) Ghazi University, Dera Ghazi Khan, PAKISTAN; (3) University of Agriculture, Faisalabad, PAKISTAN
- 104-P Physiological benefits from foliar application of penthiopyrad fungicide in wheat**
M. J. MARTIN (1), H. K. Ngugi (2), B. Perotin (3), S. Rossall (4). (1) DuPont Agriculture & Nutrition,

Columbus, OH, USA; (2) DuPont Crop Protection, Newark, DE, USA; (3) DuPont ERDC, Nambesheim, FRANCE; (4) University of Nottingham, Leicester, UNITED KINGDOM

105-P Efficacy of a single late-dormant application of mineral oil plus chlorothalonil for control of peach scab, caused by *Venturia carpophila*

T. GLENN (1), P. M. Brannen (2), C. H. Bock (3), M. W. Hotchkiss (4), J. Pitts (5), E. J. Sikora (6). (1) University of Georgia, Plant Pathology Department, Athens, GA, USA; (2) University of Georgia, Athens, GA, USA; (3) USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA; (4) USDA ARS, Byron, GA, USA; (5) Auburn University, Clanton, AL, USA; (6) Auburn University, Department of Plant Pathology, Auburn, AL, USA

106-P Fungicide sensitivity and aggressiveness of *Phytophthora betacei* isolates in Colombia

M. MIDEROS, M. Parra, N. Guayazan, G. Danies, S. Restrepo. Universidad de los Andes, Bogota, COLOMBIA

107-P Baseline sensitivity to difenoconazole in *Penicillium expansum* isolates from apple

M. E. ALI, D. R. De Angelis, K. A. Mulvaney, L. K. Pandit, A. Amiri. Washington State University, Wenatchee, WA, USA

108-P Evaluation of sensitivity of *Blumeriella jaapii* to SDHI fungicides

J. C. GLEASON (1), S. M. Slack (1), T. J. Proffer (1,2), C. A. Outwater (1), N. Rothwell (1), G. W. Sundin (1). (1) Michigan State University, East Lansing, MI, USA; (2) Kent State University, Salem, OH, USA

109-P Effects of fungicide and fertility on disease development and yield in winter wheat

M. R. BREUNIG (1), M. Nagelkirk (2), A. Byrne (1), M. Chilvers (1). (1) Michigan State University, East Lansing, MI, USA; (2) Michigan State University Extension-Sanilac County, Sandusky, MI, USA

110-P Fungicide sensitivity profiles of *Phacidiopycnis piri* and *Phacidiopycnis washingtonensis* isolates from pome fruit in Washington

M. E. ALI, L. K. Pandit, D. R. De Angelis, K. A. Mulvaney, A. Amiri. Washington State University, Wenatchee, WA, USA

111-P Effect of at-plant drench applications of Actigard on tomato seedlings for bacterial leaf spot control

H. ADKISON (1), A. Wen (2), G. E. Vallad (1). (1) University of Florida, Gulf Coast Research and Education Center, Wimauma, FL, USA; (2) University of Florida, Wimauma, FL, USA

112-P Discovery and characterization of small molecules inhibitory to *Erwinia tracheiphila*

C. VRISMAN, L. Deblais, G. Rajashekara, S. A. Miller. The Ohio State University, Wooster, OH, USA

113-P Integrated management of stripe rust of winter wheat in Wisconsin

B. MUELLER, S. Chapman, S. Conley, D. L. Smith. University of Wisconsin-Madison, Madison, WI, USA

114-P Oxathiapiprolin baseline sensitivity distribution in isolates of *Pseudoperonospora cubensis*

G. OLAYA (1), R. Linley (1), K. Edlebeck (1), P. J. Kuhn (2), A. Thomas (3), P. Ojiambo (3). (1) Syngenta Crop Protection, Vero Beach, FL, USA; (2) Syngenta Crop Protection, Greensboro, NC, USA; (3) North Carolina State University, Raleigh, NC, USA

115-P Identification of two potential small molecule chemical controls for Pierce's disease of grape

S. Zhang, M. JAIN, A. Bernert, L. A. Fleites, D. W. Gabriel. University of Florida, Gainesville, FL, USA

116-P Early season applications of azoxystrobin with starter fertilizer for *Rhizoctonia* crown and root rot control in sugar beet

G. POON, C. Irwin. Vive Crop Protection, Toronto, ON, CANADA

117-P At-bloom applications of Merivon provides season-long control of anthracnose on pomegranate in Florida

A. Nepal (1), K. Xavier (2), G. E. VALLAD (3). (1) Oregon State University, Central Point, OR, USA; (2) University of Florida/IFAS, Gulf Coast Research and Education Center, Wimauma, FL, USA; (3) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA

118-P Potential persistence of flutriafol in vineyard soils treated for control of cotton root rot, caused by *Phymatotrichopsis omnivora*

S. MCBRIDE, D. N. Appel. Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX, USA

119-P Suppression of charcoal rot (*Macrophomina phaseolina*) in annual strawberry through chemigation treatments

J. C. MERTELY, R. Martin, N. Peres. University of Florida, Gulf Coast Research and Education Center, Wimauma, FL, USA

120-P Evaluation of fungicide efficacy and application timing for the management of Glomerella leaf spot and fruit rot in North Carolina

S. M. VILLANI, R. Kreis, K. Johnson. North Carolina State University, Mills River, NC, USA

121-P In vitro sensitivity of a vascular wilt pathogen, *Ophiostoma novo-ulmi*, to paclobutrazol

S. M. ADAMS (1), J. A. Smith (2). (1) University of Florida & The Morton Arboretum, Gainesville, FL, USA; (2) University of Florida, Gainesville, FL, USA

122-P Efficacy of fungicide-based management of blueberry rust in southern Georgia

R. J. INGRAM (1), P. M. Brannen (1), M. Slusher (2), J. Taylor (3), W. Lovett (4), S. Curry (5). (1) University of Georgia, Athens, GA, USA; (2) University of Georgia Extension, Waycross, GA, USA; (3) University of Georgia Extension, Lakeland, GA, USA; (4) University of Georgia Extension, Alma, GA, USA; (5) University of Georgia Extension, Baxley, GA, USA

123-P Fungicide sensitivity and population structure of *Sclerotinia sclerotiorum* isolates from Argentina, Brazil, and U.S.A.

T. J. J. Miorini, A. Pannullo, J. R. Steadman, S. E. EVERHART. University of Nebraska, Lincoln, NE, USA

124-P Alternative soil fumigation to control *Macrophomina phaseolina*, causal agent of charcoal rot of strawberries
J. BAGGIO (1), E. Zielinski (2), L. Cordova (3), M. Chamorro (4), J. W. Noling (5), N. Peres (1). (1) University of Florida, Gulf Coast Research and Education Center, Wimauma, FL, USA; (2) Federal University of Parana (UFPR), Curitiba, BRAZIL; (3) University of Florida, Wimauma, FL, USA; (4) Driscoll's of Europe, Moguer, SPAIN; (5) University of Florida, Lake Alfred, FL, USA

125-P *In vitro* evaluation of fungicides for the management of rice kernel smut in Texas

S. S. UPPALA, S. Zhou. Texas A&M University, AgriLife Research, Beaumont, TX, USA

126-P Survival of *Ceratocystis fagacearum* following red oak log fumigation with sulfuryl fluoride

J. Juzwik (1,2), A. YANG (1), S. Myers (3), M. Furtado (3), A. Taylor (4). (1) University of Minnesota, St. Paul, MN, USA; (2) USDA Forest Service, St. Paul, MN, USA; (3) USDA APHIS PPQ, Buzzards Bay, MA, USA; (4) University of Tennessee, Knoxville, TN, USA

127-P Comparative additive control of *Fusarium verticillioides* infesting maize using *Hyptis suaveolens* and synthetic insecticide

O. F. OLOTUAH. Adekunle Ajasin University, Ondo State, NIGERIA

Crop Loss Assessment

128-P Comparison of reflectance meters for evaluation of peanut leaf spot in Georgia

B. S. JORDAN, A. K. Culbreath. University of Georgia, Tifton, GA, USA

129-P Relationship of yield loss caused by smut in sugarcane and soil properties in Louisiana

R. M. Johnson, M. P. GRISHAM. USDA-ARS, Sugarcane Research Unit, Houma, LA, USA

130-P Incidence-severity relationships for scab on foliage and fruit of pecan

C. H. BOCK. USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA

131-P Development and validation of risk assessment tools for Verticillium wilt of mint

D. L. WHEELER (1), J. K. S. Dung (2), D. A. Johnson (1). (1) Washington State University, Pullman, WA, USA; (2) Oregon State University, Madras, OR, USA

132-P Comparing the effects of *Wheat streak mosaic virus* strains on plant growth characteristics and symptom severity in hard red winter wheat

D. YABWALO (1), C. Tande (1), R. L. Geppert (2), E. Byamukama (1), M. A. Langham (1). (1) South Dakota State University, Brookings, SD, USA; (2) South Dakota

State University, Small Grain Pathology, Brookings, SD, USA

133-P Ganoderma root and butt rot in California almond

B. JOHNSON, D. M. Rizzo. University of California, Davis, CA, USA

134-P Development of a quantitative assessment method for fungal-soil particle dispersion on glass surfaces during image acquisition

A. GAMBE-GILBUENA, A. Coronel, A. A. Eda, M. C. E. Vargas, C. Pangantihon, C. Lopez, M. Chan, N. Tan-Gana, M. R. J. Estuar. Ateneo de Manila University, Quezon City, PHILIPPINES

135-P AG MAPSS: Autonomous Guidance Modular Aerial Plant Survey System

J. RUPP, M. Bruce. Montana State University, Bozeman, MT, USA

Cultural Control

136-P Factors affecting emission of AITC and subsequent disease control efficacy of *Brassica juncea* seed meal soil amendment

L. WANG (1), M. Mazzola (2). (1) Washington State University, Wenatchee, WA, USA; (2) USDA ARS, Wenatchee, WA, USA

137-P Effect of different Gramineae carbon inputs on efficacy of ASD for control of *Macrophomina phaseolina* in strawberry

S. S. HEWAVITHARANA (1), M. Mazzola (2). (1) Washington State University, Wenatchee, WA, USA; (2) USDA ARS, Wenatchee, WA, USA

138-P Deciphering potential mechanisms of anaerobic soil disinfestation (ASD)-mediated control of *Pratylenchus penetrans*

S. S. HEWAVITHARANA (1), M. Mazzola (2). (1) Washington State University, Wenatchee, WA, USA; (2) USDA ARS, Wenatchee, WA, USA

139-P Evaluating the effect of tillage on soil-borne wheat pathogens in the dryland Pacific Northwest

D. Kroese (1), K. McLaughlin (2), C. HAGERTY (1). (1) Oregon State University, Pendleton, OR, USA; (2) Oregon State University, Corvallis, OR, USA

140-P The effect of planting date on severity of *Fusarium* wilt of lettuce in California

K. R. PAUGH (1), T. R. Gordon (2). (1) University of California-Davis, Davis, CA, USA; (2) Department of Plant Pathology, University of California-Davis, Davis, CA, USA

141-P Vacuum steam as a promising alternative to methyl bromide for killing *Ceratocystis fagacearum* in *Quercus rubra* logs for global export

A. YANG (1), J. Juzwik (1,2), M. White (3), Z. Chen (3), S. Shugrue (4), R. Mack (4). (1) University of Minnesota, St. Paul, MN, USA; (2) USDA Forest Service, St. Paul, MN, USA; (3) Virginia Tech, Blacksburg, VA, USA; (4) USDA APHIS PPQ, Buzzards Bay, MA, USA

- 142-P Design and operation of static and mobile arrays to suppress powdery mildews in greenhouse and tunnel production systems with UV and visible light**
A. STENSVAND (1,2), A. Suthaparan (2), P. J. From (2), L. Grimstad (2), N. Bjugstad (2), K. A. Solhaug (2), H. R. Gislerød (2), N. S. Johansen (1), D. M. Gadoury (3), A. Bierman (4), M. Rea (4). (1) Norwegian Institute of Bioeconomy Research, Ås, NORWAY; (2) Norwegian University of Life Sciences, Ås, NORWAY; (3) Cornell University, Geneva, NY, USA; (4) Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, USA
- 143-P Sensing of UV and visible light by powdery mildew pathogens**
R. PATHAK (1), A. Sundaram (2), L. E. Cadle-Davidson (3), K. A. Solhaug (1), A. Stensvand (1,4), H. R. Gislerød (1), A. Suthaparan (1). (1) Norwegian University of Life Sciences, Ås, NORWAY; (2) Norwegian Sequencing Centre, Oslo University Hospital, Oslo, NORWAY; (3) USDA Grape Genetics Research Unit, Geneva, NY, USA; (4) Norwegian Institute of Bioeconomy Research, Ås, NORWAY
- 144-P Sustainable approaches for soilborne disease management in nursery production**
P. Liyanapathirana, M. N. Kabir, T. Simmons, F. BAYSAL-GUREL. Tennessee State University, McMinnville, TN, USA
- 145-P Effect of carbon sources in anaerobic soil disinfestation to reduce soilborne pests in okra and brinjal in Nepal**
R. B. KHADKA (1), M. Marasini (2), R. Rawal (2), A. L. Testen (3), S. A. Miller (1). (1) The Ohio State University, Wooster, OH, USA; (2) Regional Agricultural Research Station, Nepal Agricultural Research Council, Banke, NEPAL; (3) The Ohio State University OARDC, Wooster, OH, USA
- 146-P Incorporating disease-suppressive rotation crops and organic amendments into improved potato cropping systems**
R. P. LARKIN. USDA ARS, Orono, ME, USA
- 147-P Practical and accurate measurement of ultraviolet radiation (UV) for research and application in plant pathosystems**
A. BIERMAN (1), L. Radetsky (1), J. S. Patel (1), M. Figueiro (2), T. Plummer (1), M. Rea (1), D. M. Gadoury (3), A. Suthaparan (4), A. Stensvand (5), N. Peres (6), R. Borba Onofre (6). (1) Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, USA; (2) Lighting Research Center, Troy, NY, USA; (3) Cornell University, Geneva, NY, USA; (4) Norwegian University of Life Sciences, Ås, NORWAY; (5) Norwegian Institute of Bioeconomy Research, Ås, NORWAY; (6) University of Florida, Gulf Coast Research and Education Center, Wimauma, FL, USA
- 148-P Modifying row cover systems to manage bacterial wilt in organic muskmelon in Iowa**
H. M. NELSON. Iowa State University, Ames, IA, USA
- 149-P Impact of cover crop usage on soilborne pathogens in a nursery production system**
S. Dawadi, K. Adesso, P. A. O'Neal, P. Liyanapathirana, M. Pandey, F. BAYSAL-GUREL. Tennessee State University, McMinnville, TN, USA
- 150-P UV-C radiation treatment on Andean lupine seed for control anthracnose infection and increase crop production**
C. E. FALCONI (1), V. Yanez-Mendizábal (2). (1) Universidad de Las Fuerzas Armadas - ESPE, Carrera de Ingeniería Agropecuarias, Sangolquí, ECUADOR; (2) Universidad de las Américas, Facultad de Facultad de Ingeniería y Ciencias Agropecuarias, Quito, ECUADOR
- 151-P Root response of huanglongbing-affected citrus trees to steam thermotherapy**
K. GERBERICH (1), S. L. Commerford (1), R. Ehsani (2), M. M. Dewdney (2), E. G. Johnson (2). (1) University of Florida Citrus Research and Education Center, Lake Alfred, FL, USA; (2) University of Florida, Lake Alfred, FL, USA
- 152-P Severity of strawberry powdery mildew in open field vs under plastics that either block or transmit UV light**
R. BORBA ONOFRE (1), R. Luis Vieira (2), S. Arupillai (3), A. Stensvand (4), D. M. Gadoury (5), N. Peres (1). (1) University of Florida, Gulf Coast Research and Education Center, Wimauma, FL, USA; (2) Universidade de Passo Fundo, Passo Fundo, BRAZIL; (3) Norwegian University of Life Sciences, Ås, NORWAY; (4) Norwegian Institute of Bioeconomy Research (NIBIO), Ås, NORWAY; (5) Cornell University, Geneva, NY, USA
- 153-P Heat treatment for management of *Botrytis cinerea* inoculum on strawberry**
A. ZUNIGA (1), N. Peres (2). (1) University of Florida, Wimauma, FL, USA; (2) Gulf Coast Research and Education Center; University of Florida, Wimauma, FL, USA
- 154-P Boron tolerance and clubroot development in *Brassica napus***
A. McLean (1), B. D. GOSSEN (2), M. R. McDonald (1). (1) University of Guelph, Guelph, ON, CANADA; (2) Agriculture & Agri-Food Canada, Saskatoon, SK, CANADA
- 155-P Effective pruning method for twigs showing black shoot blight disease symptoms in apple trees**
D. H. PARK (1), C. S. Oh (2). (1) Kangwon National University, Chuncheon, KOREA; (2) Kyung Hee University, Yongin, KOREA
- 156-P Effects of dry heat treatment on *Cucumber green mottle mosaic virus* and infection activity**
C. LIANG (1,2,3,4), L. Luo (1,2), J. Li (1,2), B. Baker (3,4). (1) China Agricultural University, Beijing, CHINA; (2) Beijing Key Laboratory of Seed Disease Testing and Control, Beijing, CHINA; (3) Plant Gene Expression Center, USDA-ARS, Albany, CA, USA; (4) Department of Plant and Microbial Biology, University of California, Berkeley, CA, USA
- 157-P The effect of tree wound pastes on callus formation**
S. H. LEE (1), J. H. Park (2), C. H. Jeon (1). (1) National Institute of Forest Science, Jeju-do, REPUBLIC OF (SOUTH) KOREA; (2) Korea Forest Research Inst, Seoul, REPUBLIC OF (SOUTH) KOREA

158-P Heat treatment as an alternative to fungicide application for control of strawberry anthracnose caused by *Colletotrichum acutatum*

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159-P Evaluation of a nutritional approach for disease control of *Burkholderia glumae* and *B. gladioli* interaction in rice

C. A. Riera-Ruiz (1,2), J. Castro-Lara (3), M. I. Jimenez Feijoo (3), J. CEVALLOS-CEVALLOS (4). (1) Centro de Investigaciones Biotecnológicas del Ecuador, Guayaquil, ECUADOR; (2) CIBE-ESPOL, Guayaquil, ECUADOR; (3) Escuela Superior Politécnica del Litoral, Guayaquil, ECUADOR; (4) Escuela Superior Politécnica del Litoral, ESPOL, Guayaquil, ECUADOR

160-P Broccoli residue and chitin amendments reduce *Verticillium* wilt in three soil types

K. D. PURI (1), D. P. G. Short (1), P. Inderbitzin (2), D. O. Chellemi (3), K. V. Subbarao (4). (1) University of California-Davis, Salinas, CA, USA; (2) University of California, Davis, CA, USA; (3) Agricultural Solutions, Fernandina Beach, FL, USA; (4) University of California-Davis, c/o U.S. Agricultural Research Station, Salinas, CA, USA

161-P Canopy and root response of HLB-affected citrus trees to steam-generated thermotherapy

N. THAPA (1), S. L. Commerford (2), R. Ehsani (1), E. G. Johnson (1), M. M. Dewdney (1). (1) University of Florida, Lake Alfred, FL, USA; (2) University of Florida Citrus Research and Education Center, Lake Alfred, FL, USA

162-P Switchgrass extractives reduce bacterial diseases of tomato foliage and populations of foodborne pathogens on tomato fruit

A. I. Bruce (1), B. H. OWNLEY (1), J. Tao (2), N. Labbé (2), K. Gwinn (1), D. D'Souza (3), N. Moustaid-Moussa (4). (1) University of Tennessee, Department of Entomology and Plant Pathology, Knoxville, TN, USA; (2) University of Tennessee, Center for Renewable Carbon, Knoxville, TN, USA; (3) University of Tennessee, Food Science Department, Knoxville, TN, USA; (4) Texas Tech University, Department of Nutritional Sciences, Lubbock, TX, USA

163-P The use of eco-mesh bags for environmentally friendly controlling pine wilt

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164-P Pre-inoculation treatment of basil plants with ultraviolet-B radiation induces resistance to downy mildew

J. S. PATEL (1), L. Radetsky (1), T. Plummer (1), A. Bierman (1), D. M. Gadoury (2), M. Rea (1). (1) Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, USA; (2) Cornell University, Geneva, NY, USA

165-P Utility of planting variable-sized whole tubers simulating a European belt-style planter to reduce seed piece decay in seed potato production

K. M. DUELLMAN KINZER (1), M. C. Bertram (1), M. A. Lent (1), J. C. Randall (1), S. A. Clark (2). (1) University of Idaho, Idaho Falls, ID, USA; (2) Brigham Young University-Idaho, Rexburg, ID, USA

Disease Detection and Diagnosis

166-P Survey of viruses infecting sweet cherry (*Prunus avium*) in Oregon

L. A. LUTES, J. W. Pscheidt. Oregon State University, Corvallis, OR, USA

167-P A real-time PCR assay for the differentiation of *Pantoea stewartii* subsp. *stewartii* from *Pantoea stewartii* subsp. *indologenes* in corn seed

N. Pal (1), C. C. BLOCK (2). (1) USDA-ARS, Ames, IA, USA; (2) Iowa State University, Ames, IA, USA

168-P Development and validation of two rapid isothermal detection assays for root-infecting fungi detection on turfgrass

B. KARAKKAT, M. Franchett, M. Olson, C. Mullenberg, P. L. Koch. University of Wisconsin, Madison, WI, USA

169-P Development and validation of a loop-mediated isothermal amplification (LAMP) assay for detection of citrus leprosis cytoplasmic type 2 in plants

B. ADDUCCI, G. Wei, A. Roy, V. A. Mavrodieva, M. K. Nakhla. USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA

170-P Validation of a quadruplex real-time RT-PCR assay for simultaneous detection of three citrus leprosis viruses in plants

B. ADDUCCI (1), G. Wei (1), A. Roy (1), V. A. Mavrodieva (1), G. Dennis (2), W. Schneider (3), R. H. Bransky (4), M. K. Nakhla (1). (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (2) USDA-APHIS-PPQ-S&T-CPHST, Raleigh, NC, USA; (3) USDA ARS FDWSRU, Fort Detrick, MD, USA; (4) University of Florida, Lake Alfred, FL, USA

171-P Development of two multiplex RT-PCRs for simultaneous detection of five cytoplasmic and three nuclear viruses associated with citrus leprosis complex

A. ROY (1), A. L. Stone (2), G. Leon Martinez (3), G. Otero-Colina (4), M. J. Melzer (5), J. S. Hartung (6), G. Wei (1), V. A. Mavrodieva (1), R. H. Bransky (7), W. Schneider (2), M. K. Nakhla (1). (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (2) USDA ARS FDWSRU, Fort Detrick, MD, USA; (3) CORPOICA, Villavicencio, COLOMBIA; (4) Colegio de Postgraduados, Texcoco, MEXICO; (5) University of Hawaii, Honolulu, HI, USA; (6) USDA ARS MPPL, Beltsville, MD, USA; (7) University of Florida, Lake Alfred, FL, USA

- 172-P Development of a rapid, specific, and sensitive isothermal assay for the detection of *Verticillium alfalfae***
A. J. Reyes Gaige (1), J. K. S. Dung (2), J. E. WEILAND (3). (1) Oregon State University, Corvallis, OR, USA; (2) Oregon State University, Madras, OR, USA; (3) USDA ARS, Corvallis, OR, USA
- 173-P Development of digital PCR assays for plant pathogen diagnosis**
Q. XIANG (1), J. Rascoe (1), S. Costanzo (1), Z. Liu (2), M. K. Nakhla (1). (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (2) USDA APHIS PPQ, Riverdale, MD, USA
- 174-P Genomics-informed molecular detection of *Xanthomonas vasicola* causing bacterial leaf streak of corn in the United States**
M. J. STULBERG (1), B. Kasiborski (1), D. Studholme (2), G. P. Munkvold (3), C. C. Block (3), S. Arias (3), J. Rascoe (1), M. K. Nakhla (1). (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (2) University of Exeter, Exeter, UNITED KINGDOM; (3) Iowa State University, Ames, IA, USA
- 175-P Optimizing the molecular tools for *Phytophthora cinnamomi* detection in environmental samples**
S. CRANDALL (1), P. M. Manosalva (2), T. Miles (1). (1) California State University-Monterey Bay, Seaside, CA, USA; (2) Department of Plant Pathology and Microbiology, University of California, Riverside, CA, USA
- 176-P Development of a sensitive real-time PCR detection method for *Citrus tatter leaf virus***
M. KUNTA, J. W. Park, M. Gonzalez, P. Vedasharan, J. V. da Graça. Texas A&M University Kingsville, Citrus Center, Weslaco, TX, USA
- 177-P A new diagnostic real-time PCR method for huanglongbing detection in citrus root tissue**
J. W. Park (1), W. E. Braswell (2), P. Stansly (3), J. Rascoe (4), E. Louzada (1), G. McCollum (5), J. V. da Graça (1), M. KUNTA (1). (1) Texas A&M University Kingsville, Citrus Center, Weslaco, TX, USA; (2) USDA APHIS PPQ CPHST, Edinburg, TX, USA; (3) University of Florida/IFAS/SWFREC, Immokalee, FL, USA; (4) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (5) USDA, ARS, USHRL, Fort Pierce, FL, USA
- 178-P Measurement of complex permittivity of plant cells and detection of cellular state alteration by waveguide penetration and coaxial probe**
T. FURUKAWA (1), A. Kazamaki (2), A. Kik (2), Y. Suzuki (2). (1) Department of Biological Sciences, Tokyo Metropolitan University, Hachioji-shi, JAPAN; (2) Department of Electrical & Electronic Engineering, Tokyo Metropolitan University, Tokyo, JAPAN
- 179-P Rapid detection of *Hop stunt viroid*, *Potato spindle tuber viroid*, and *Tomato chlorotic dwarf viroid* using isothermal AmplifyRP**
S. ZHANG (1), P. Russell (1), B. Davenport (1), R. Li (1), D. Groth-Helms (1), R. W. Hammond (2). (1) Agdia, Inc., Elkhart, IN, USA; (2) USDA ARS Molecular Plant Pathology Laboratory, Beltsville, MD, USA
- 180-P Use of LAMP for in-field early detection of *Raffaelea lauricola*, the causal agent of laurel wilt disease**
J. N. Workman (1), S. W. Fraedrich (2), C. VILLARI (1). (1) D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA, USA; (2) USDA Forest Service, Athens, GA, USA
- 181-P First detection of *Phytophthora* species of concern at the U.S.A.: The role of the USDA-APHIS-PPQ-CPHST Beltsville Laboratory**
Z. G. ABAD, J. C. Bienapfl, L. M. Knight, D. D. Picton, A. Barth, M. K. Nakhla. USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA
- 182-P Detection of *Papaya ringspot virus* using an ultra-sensitive single-tube nested PCR**
I. HAMIM, J. S. Hu. University of Hawaii at Manoa, Honolulu, HI, USA
- 183-P Exploring the use of NGS technology for citrus HLB diagnosis and microbiome research**
Z. Zheng (1), F. Wu (1), M. Xu (1), X. Deng (1), M. J. Stulberg (2), J. Rascoe (2), X. Sun (3), A. Jeyaprakash (3), J. CHEN (4). (1) South China Agricultural University, Guangzhou, CHINA; (2) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (3) Florida Department of Agriculture & Consumer Service, Gainesville, FL, USA; (4) USDA-ARS-PWA, Parlier, CA, USA
- 184-P Molecular detection and quantification of root-lesion nematode, *Pratylenchus penetrans*, from soil using real-time PCR**
R. Baidoo, G. YAN. North Dakota State University, Department of Plant Pathology, Fargo, ND, USA
- 185-P Development of a CANARY (cellular analysis and notification of antigen risk and yield) assay for detection of *Ralstonia solanacearum* R3B2**
W. CAI (1), F. Nargi (2), J. Elphinstone (3), S. Costanzo (1), J. Rascoe (1), Z. Liu (4), M. K. Nakhla (1). (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (2) MIT Lincoln Laboratory, Lexington, MA, USA; (3) Central Science Laboratory, York, UNITED KINGDOM; (4) USDA APHIS PPQ, Riverdale, MD, USA
- 186-P Evaluation of immunoreagents for development of a diagnostic assay specific for *Rathayibacter toxicus***
D. LUSTER (1), M. B. McMahon (1), A. Sechler (1), E. E. Rogers (1), W. Schneider (1), B. Schroeder (2), T. D. Murray (3). (1) USDA ARS FDWSRU, Fort Detrick, MD, USA; (2) University of Idaho, Moscow, ID, USA; (3) Washington State University, Pullman, WA, USA
- 187-P Rollout of a simplified DNA isolation method and LAMP for on-site detection of citrus black spot**
G. MARRERO (1), K. A. Zeller (1), K. Levin (1), T. D. Riley (2), H. D. Gomez (3), Z. G. Abad (1). (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA; (2) USDA APHIS PPQ, Orlando, FL, USA; (3) USDA APHIS PPQ, Davie, FL, USA
- 188-P Development and evaluation of molecular methods for species-specific detection of *Phytophthora quercina***
J. C. BIENAPFL (1), K. Jennings (1), L. Schena (2), J. Juzwik (3), Z. G. Abad (1). (1) USDA-APHIS-PPQ-S&T-

CPHST, Beltsville, MD, USA; (2) Università Mediterranea Di Reggio Calabria, Reggio Calabria, ITALY; (3) USDA Forest Service, St. Paul, MN, USA

189-P Comparison of next-generation sequencing platforms and library preparation for the analysis of metagenomic diversity

D. Sherman (1), A. L. Stone (1), J. King (2), A. Bronzato (2), W. SCHNEIDER (1). (1) USDA ARS FDWSRU, Fort Detrick, MD, USA; (2) Mississippi State University, Mississippi State, MS, USA

190-P A novel molecular toolkit for rapid detection of the pathogen and primary vector of thousand cankers disease

E. Oren (1), W. Klingeman (1), R. O. Gazis (1), J. Moulton (1), P. Lambdin (1), M. Coggeshall (2), J. Hulcr (3), S. J. Seybold (4), D. HADZIABDIC (1). (1) University of Tennessee, Knoxville, TN, USA; (2) USDA Forest Service, Northern Research Station, West Lafayette, IN, USA; (3) University of Florida, Gainesville, FL, USA; (4) USDA Forest Service, Pacific Southwest Research Station, Davis, CA, USA

191-P Development of a recombinase-polymerase amplification assay for *Clavibacter michiganensis* subsp. *sepedonicus*

R. Li (1), P. Russell (1), D. GROTH-HELMS (1), S. Zhang (1), B. Davenport (1), K. Schuetz (1), C. A. Ishimaru (2). (1) Agdia, Inc., Elkhart, IN, USA; (2) University of Minnesota, St. Paul, MN, USA

192-P A reverse transcription-loop mediated isothermal amplification assay for the detection of pospiviroids in tomato seeds

N. A. GONZALEZ, G. P. Munkvold. Iowa State University, Ames, IA, USA

193-P Development of multiplex-PCR for simultaneous detection of phytoplasmas causing lethal yellowing and date palm lethal decline in palms

A. RAVINDRAN, J. Ueckert, K. Ong. Texas A&M University, AgriLife Extension Service, College Station, TX, USA

194-P Coupling spore traps and quantitative PCR assays for detection of *Cercospora sojina*, the causal agent of soybean frogeye leaf spot

B. LIN (1), H. M. Kelly (1), H. Yu (2), A. Mengistu (3). (1) University of Tennessee, Jackson, TN, USA; (2) Tusculum College, Greeneville, TN, USA; (3) USDA ARS, Jackson, TN, USA

195-P Harmonization of seed testing methods for *Pepper mild mottle virus*

T. BRUNS (1), G. P. Munkvold (1), R. L. Dunkle (2). (1) Iowa State University, Ames, IA, USA; (2) American Seed Trade Association, Alexandria, VA, USA

196-P Detection, quantification, and seasonal movement of *Xylella fastidiosa* in grafted and own-root Meadowlark blueberries

D. BAYO (1), R. Darnell (2), J. Williamson (2), P. Harmon (1). (1) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (2) Horticultural Sciences Department, University of Florida, Gainesville, FL, USA

197-P Detection of *Spiroplasma citri* by droplet digital PCR

Y. Maheshwari (1), V. Selvaraj (1), S. Hajeri (2), R. K. YOKOMI (3). (1) USDA ARS, Parlier, CA, USA; (2) Citrus Pest Detection Program (CCTEA), Tulare, CA, USA; (3) USDA ARS PWA, Parlier, CA, USA

198-P Dickeya black leg—A new challenge for Florida's potato farmers and a new pathogen detection task for University of Florida Plant Diagnostic Center

S. BEC, C. Lapaire Harmon. University of Florida, Plant Diagnostic Center, Gainesville, FL, USA

199-P Utilizing mitochondrial markers and T-RFLP data to identify *Phytophthora* species in mixed environmental samples

T. MILES (1), K. P. Coats (2), G. A. Chastagner (2), F. N. Martin (3). (1) California State University-Monterey Bay, Seaside, CA, USA; (2) Washington State University, Puyallup, WA, USA; (3) USDA ARS, Salinas, CA, USA

200-P EDNA-Rose a novel approach for detecting rose viruses combining next-generation sequencing and bioinformatics

L. PENA ZUNIGA (1), A. Espindola (1), P. Klein (2), T. Debener (3), J. Rees (4), D. Byrne (2), K. F. Cardwell (1), F. Ochoa Corona (1). (1) Oklahoma State University, Stillwater, OK, USA; (2) Texas A&M University, College Station, TX, USA; (3) Leibniz Universität Hannover, Institute of Plant Genetics, Hannover, GERMANY; (4) Agricultural Research Council-Biotechnology Platform, Pretoria, SOUTH AFRICA

201-P Detection and differentiation of arthropod-transmitted viruses of cereal crops using multiplex PCR and high resolution melting

P. RYDZAK (1), F. Ochoa Corona (1), A. E. Whitfield (2), A. C. Wayadande (1). (1) Oklahoma State University, Stillwater, OK, USA; (2) Kansas State University, Manhattan, KS, USA

202-P Introducing *PrimerCHECKER*, a PCR primer performance graphic display generator

K. V. Salinas Villacís (1), H. Espitia-Navarro (2), J. Garcia-Suarez (3), F. OCHOA CORONA (4). (1) Freelance Consultant, Quito, ECUADOR; (2) Georgia Institute of Technology, Atlanta, GA, USA; (3) The Army University - ESPE, Sangolquí, ECUADOR; (4) Oklahoma State University, Stillwater, OK, USA

203-P Two genomospecies in the culture collection strains of *Pseudomonas syringae* pv. *atrofaciens*

D. SHIN (1), G. I. Heo (2), H. I. Lee (3), J. S. Cha (4). (1) Chungbuk National University, Cheungju-Si, REPUBLIC OF (SOUTH) KOREA; (2) Chungbuk National University, Cheongju-si, KOREA; (3) Animal and Plant Quarantine Agency, Gimcheon, KOREA; (4) Chungbuk National University, Cheongju Chungbuk, KOREA

204-P Development of a sequence-specific PCR assay for burrowing nematode (*Radopholus similis*) detection

C. S. CHANG (1), J. I. Yang (2). (1) Department of Plant Pathology and Microbiology, National Taiwan University, Taipei, TAIWAN; (2) National Taiwan University, Taipei, TAIWAN

- 205-P Validation of viability/enrichment (ve) PCR-based detection of viable *Acidovorax citrulli* in melon and watermelon seed samples**
R. WILLMANN, A. Beerepoot, B. P. Woudt. Syngenta Seeds, Enkhuizen, NETHERLANDS
- 206-P Detection and genome characterization of a mixed infection of *Crinum* mosaic, *Nerine* latent, and *Nerine* yellow stripe viruses in ornamental *Crinum***
R. L. JORDAN (1), M. Wingert (2), C. Loudon (2), M. A. Guaragna (1). (1) USDA-ARS, USNA, Floral & Nursery Plants Research, Beltsville, MD, USA; (2) Biotechnology Academy, Applications and Research Lab (Howard County), Ellicott City, MD, USA
- 207-P Development of a CANARY® multiplex testing platform for rapid identification of *Ralstonia solanacearum***
A. A. AHMAD (1,2), D. N. Kalkofen (3), R. Rana (3), J. J. Legett (3), A. R. Flannery (3), Q. Huang (1). (1) FNPRU, U.S. National Arboretum, USDA/ARS, Beltsville, MD, USA; (2) Minia University, El-Minia, EGYPT; (3) PathSensors, Inc., Baltimore, MD, USA
- 208-P Multiplex assay for the quantitative assessment of *Rhizoctonia solani* AG2-2, AG4, and *R. zeae* from the soil**
T. ALBRECHT (1), K. M. Webb (2), R. M. Harveson (3), K. D. Broders (1). (1) Colorado State University, Fort Collins, CO, USA; (2) USDA-ARS, Soil Management and Sugar Beet Research Unit, Fort Collins, CO, USA; (3) University of Nebraska, Panhandle Research & Extension Center, Scottsbluff, NE, USA
- 209-P Detection and quantification of *Septoria glycines* in soybeans with real-time PCR**
H. A. LIN, S. X. Mideros Mora. University of Illinois at Urbana-Champaign, Urbana, IL, USA
- 210-P Improved media for isolation of *Pseudomonas savastanoi* pv. *savastanoi* from olive knots and development of an in vitro pathogenicity bioassay**
M. Salman (1), D. A. KLUEPFEL (2). (1) Palestine Technical University-Kadoorie, Tulkarm, PALESTINE; (2) USDA ARS, Crops Pathology & Genetics Research Unit, Davis, CA, USA
- 211-P Comparison of primers for the detection of North American strains of *Dickeya* species in seed potato stems and tubers**
A. S. B. NASARUDDIN (1), B. N. Babler (2), N. T. Perna (2), J. D. Glasner (2), A. O. Charkowski (1). (1) Colorado State University, Fort Collins, CO, USA; (2) University of Wisconsin, Madison, WI, USA
- 212-P High-throughput molecular screening for the presence of citrus pathogens in the citrus germplasm collection of Punjab, Pakistan**
R. Haq (1), S. BODAGHI (2), T. Dang (2), I. Lavagi (2), S. H. Tan (2), S. Naz (1), G. Vidalakis (2). (1) Lahore College for Women University, Lahore, PAKISTAN; (2) University of California-Riverside, Riverside, CA, USA
- 213-P Molecular diagnostics for exotic cotton leaf curl begomovirus-betasatellites undergoing diversification and expansion**
A. S. AVELAR, J. K. Brown, M. Ilyas. School of Plant Sciences, University of Arizona, Tucson, AZ, USA
- 214-P Validation of species-specific primers for detection and discrimination of *Pythium aphanidermatum* and *P. deliense***
S. Wallace (1), M. F. Proano (1), A. Espindola (1), M. Arif (2), M. L. Daughtrey (3), C. D. GARZON (1). (1) Oklahoma State University, Stillwater, OK, USA; (2) University of Hawaii at Manoa, Honolulu, HI, USA; (3) Cornell University, Long Island, NY, USA
- 215-P Seed extract TaqMan PCR for the detection of *Clavibacter michiganensis* subsp. *michiganensis* in seeds of tomato**
H. KOENRAADT. Naktuinbouw, Roelofarendsveen, NETHERLANDS
- 216-P Identification and distribution of pathogens associated with field pea diseases in Montana State**
J. MGBECHI-EZERI, A. Owati, C. Peluola, M. E. Burrows, B. Agindotan. Montana State University, Bozeman, MT, USA
- 217-P Rapid detection of pathogen in complex metagenomic data by EDNA**
M. SHARP. Oklahoma State University, Stillwater, OK, USA
- 218-P Detection and absolute quantification of *Sugarcane yellow leaf virus* (SCYLV) by real-time PCR for successive vegetative cycles in sugarcane in Colombia**
C. Cardozo (1,2), Y. C. Acosta Vega (2,3), M. Cadavid (2), H. A. Chica (2), J. C. Angel S. (2), J. I. Victoria (2), C. A. ANGEL (2,4). (1) Universidad Nacional de Colombia Campus Palmira, Palmira, COLOMBIA; (2) Cenicaña, Cali, COLOMBIA; (3) Bogota, COLOMBIA; (4) Cenicafe-Colombia, Manizales, COLOMBIA
- 219-P Mitochondrial markers to detect *Pythium* at a genus and species-specific level using TaqMan and recombinase polymerase amplification**
T. MILES (1), F. N. Martin (2). (1) California State University-Monterey Bay, Seaside, CA, USA; (2) USDA ARS, Salinas, CA, USA
- 220-P Analysis of *Amylostereum areolatum* (Russulales: *Amylostereaceae*) symbiont from two populations of *Sirex nigricornis* Fabricius (Hymenoptera: Siricidae)**
R. O. OLATINWO (1), T. Schowalter (2). (1) USDA Forest Service, Pineville, LA, USA; (2) Louisiana State University AgCenter, Baton Rouge, LA, USA

Fungicide Resistance

- 221-P Detection of mefenoxam-insensitive populations of *Pseudoperonospora humuli* in Wisconsin hop yards**
M. E. MARKS, A. J. Gevens. University of Wisconsin-Madison, Madison, WI, USA
- 222-P Occurrence of fungicide resistance in *Pseudoperonospora cubensis* populations causing cucurbit downy mildew in commercial and wild hosts**
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NC, USA; (2) North Carolina State University, Department of Entomology and Plant Pathology, Raleigh, NC, USA; (3) California State University-Monterey Bay, Seaside, CA, USA; (4) North Carolina State University, Department of Plant Pathology, Raleigh, NC, USA

223-P Fungicide resistance in *B. fragariae* and species prevalence in the United States East Coast

M. DOWLING, M. Hu, G. Schnabel. Clemson University, Clemson, SC, USA

224-P Characterizing spatial and temporal variation in fungicide sensitivity of *Venturia effusa* within a pecan orchard

J. R. STANDISH, T. B. Brenneman, K. L. Stevenson. University of Georgia, Tifton, GA, USA

225-P *Botrytis cinerea* isolates lacking the Mrr1 R632I mutation are multi-resistant to postharvest fungicides which impacts apple grey mold management

W. M. Jurick II (1), O. Macarasin (2), V. L. Gaskins (1), I. Vico (3), J. Yu (2), K. A. Peter (4), W. J. Janisiewicz (5), K. D. COX (6). (1) USDA-ARS Food Quality Laboratory, Beltsville, MD, USA; (2) USDA ARS, Beltsville, MD, USA; (3) University of Belgrade, Faculty of Agriculture, Belgrade, SERBIA AND MONTENEGRO; (4) Penn State University, Biglerville, PA, USA; (5) USDA-ARS AFRS, Kearneysville, WV, USA; (6) Cornell University, Geneva, NY, USA

226-P Effect of SDHI-fungicide sprays and pistachio hedging on *Alternaria alternata* sensitivity

P. D. S. F. LICHTENBERG (1), W. Zeviani (2), R. Puckett (1), T. J. Michailides (1). (1) University of California-Davis, Parlier, CA, USA; (2) Universidade Federal do Paraná, Curitiba, BRAZIL

227-P QoI resistance among *Colletotrichum* species found in Virginia vineyards

D. McHenry, A. Bly, C. L. Oliver, M. NITA. Virginia Polytechnic Institute and State University, Winchester, VA, USA

228-P Resistance of *Botrytis cinerea* from California strawberries to ten fungicides

S. D. Cosseboom (1), G. SCHNABEL (2), K. L. Ivors (1), G. J. Holmes (1). (1) Strawberry Center, California Polytechnic State University, San Luis Obispo, CA, USA; (2) Clemson University, Clemson, SC, USA

229-P Occurrence of prochloraz resistance in *Colletotrichum higginsianum* in South China

L. YU, G. Lan, X. She, Y. Tang, M. Deng, Z. He. Plant Protection Research Institute, Guangdong Academy of Agricultural Sciences, Guangzhou, CHINA

230-P *Alternaria* leaf spot in Michigan and fungicide sensitivity issues

L. E. HANSON (1), N. Rosenzweig (2), Q. Jiang (2), P. Samohano (2). (1) USDA ARS, East Lansing, MI, USA; (2) Michigan State University, East Lansing, MI, USA

231-P Effect of mefenoxam-acquired resistance on sporulation and dry weight in *Phytophthora infestans*

M. REGNIER, J. Gonzalez Tobon, M. Mideros, S. Restrepo, G. Danies. Universidad de los Andes, Bogota, COLOMBIA

232-P Is the phenomenon of acquired resistance in *Phytophthora infestans* universal?

J. GONZALEZ TOBON (1), R. Childers (2), M. Regnier (1), M. Mideros (1), S. Restrepo (1), G. Danies (1). (1) Universidad de los Andes, Bogota, COLOMBIA; (2) Harvard University, Cambridge, MA, USA

233-P *Sclerotinia homoeocarpa* populations and their resistance to fungicides

C. STEPHENS, J. E. Kaminski III. Penn State University, University Park, PA, USA

234-P Sensitivity to azoxystrobin in selected Kentucky populations of *Cercospora nicotianae*, the frog-eye leaf spot pathogen of tobacco

W. Barlow, E. W. Dixon, R. Pearce, E. E. PFEUFER. University of Kentucky, Lexington, KY, USA

235-P Occurrence of fungicide resistance in *Alternaria* populations to commonly used fungicides in Idaho

K. FAIRCHILD (1), A. Malek (1), P. S. Wharton (2). (1) University of Idaho, Aberdeen, ID, USA; (2) University of Idaho, Aberdeen Research and Extension Center, Aberdeen, ID, USA

GENETICS OF RESISTANCE

236-P Response of sorghum stalk pathogens to near-isogenic brown midrib plants and their soluble extracts

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237-P Evaluation of *Cucurbita pepo* breeding lines with reduced susceptibility to root and crown rot caused by *Phytophthora capsici*

G. VOGEL (1), K. LaPlant (1), M. Mazourek (1), M. Gore (1), C. D. Smart (2). (1) Plant Breeding and Genetics Section, Cornell University, Ithaca, NY, USA; (2) Plant Pathology and Plant Microbe Biology Section, Cornell University, Geneva, NY, USA

238-P Molecular mapping and comparison of *YrTr1* with other genes on chromosome 1BS for resistance to wheat stripe rust

J. Feng (1,2), M. Wang (1), X. CHEN (3). (1) Washington State University, Pullman, WA, USA; (2) Biotechnology and Nuclear Technology Research Institute, Chengdu, CHINA; (3) USDA ARS, Pullman, WA, USA

239-P Adaptation of *Phytophthora nicotianae* to partial resistance in tobacco

J. JIN, I. Carbone, D. Shew. North Carolina State University, Raleigh, NC, USA

240-P Host resistance of flue-cured tobacco (*Nicotiana tabacum* L.) for the management of tobacco black shank (*Phytophthora nicotianae*)

L. D. THIESSEN. North Carolina State University, Raleigh, NC, USA

241-P Use of FT-IR for rapid phenotyping of European ash resistance levels to ash dieback

C. VILLARI (1), A. Dowkiw (2), R. Enderle (3),

M. Ghasemkhani (4), T. Kirisits (5), E. Kjaer (6), D. Marčiulynienė (7), L. McKinney (6), B. Metzler (3), F. Munoz (2), L. Rostgaard Nielsen (6), A. Pliūra (7), L. G. Stener (8), V. Suchockas (7), L. Rodriguez-Saona (9), P. Bonello (10), M. Cleary (4). (1) D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA, USA; (2) INRA, Ardon, Orléans Cedex, FRANCE; (3) Forest Research Institute Baden-Württemberg, Department Forest Protection, Freiburg, GERMANY; (4) Swedish University of Agricultural Sciences (SLU), Southern Swedish Forest Research Centre, Alnarp, SWEDEN; (5) University für Bodenkultur (BOKU), Vienna, AUSTRIA; (6) Department of Geosciences and Natural Resource Management, University of Copenhagen, Copenhagen, DENMARK; (7) Lithuanian Research Centre for Agriculture and Forestry, Institute of Forestry, Girionys, Kaunas District, LITHUANIA; (8) The Forestry Research Institute of Sweden (SKOGFORSK), Svalöv, SWEDEN; (9) Department of Food Science and Technology, The Ohio State University, Columbus, OH, USA; (10) Department of Plant Pathology, The Ohio State University, Columbus, OH, USA

242-P Genetic characterization of resistance to *Sclerotinia* in lettuce cultivar Eruption

B. E. MAMO (1), R. J. Hayes (2,3), M. J. Truco (4), R. W. Michelmore (4), K. V. Subbarao (1), I. Simko (5). (1) University of California-Davis, c/o U.S. Agricultural Research Station, Salinas, CA, USA; (2) USDA ARS, Forage Seed and Cereal Research Unit, Corvallis, OR, USA; (3) USDA ARS, Corvallis, OR, USA; (4) University of California-Davis, Genome Center and Department of Plant Sciences, Davis, CA, USA; (5) USDA ARS, Crop Improvement and Protection Unit, Salinas, CA, USA

243-P Two new late blight resistant home garden varieties of tomato with tolerance to *Septoria* leaf spot

R. MAHFUZ, M. E. Gallegly Jr. West Virginia University, Morgantown, WV, USA

244-P Using allele-specific PCR for genotyping different mutations selected by the use of SDHI in populations of *Alternaria alternata* in California

P. D. S. F. LICHTENBERG, Y. Luo, T. J. Michailides. University of California-Davis, Parlier, CA, USA

245-P QTL mapping for *Meloidogyne incognita* and *M. hapla* resistance in one recombinant inbred line population of soybean

C. Li (1), J. Wang (1), J. Abe (2), F. Kong (1), C. WANG (1). (1) Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Harbin, CHINA; (2) Laboratory of Plant Genetics and Evolution, Hokkaido University, Sapporo, JAPAN

246-P Population dynamics of blast fungus leads to breakdown of resistance to rice blast

Y. KIM, J. Goh, I. J. Kang, H. K. Shim, S. Heu, J. H. Roh. National Institute of Crop Science, RDA, Suwon, REPUBLIC OF (SOUTH) KOREA

247-P Tomato functional genomic screen to find novel resources for development of resistant cultivars against *Sclerotinia minor*

A. HATTORI (1), Y. Ishiga (2). (1) Graduate School of Life and Environmental Sciences, University of Tsukuba, Tsukuba, JAPAN; (2) University of Tsukuba, Tsukuba, JAPAN

248-P Development of an RAPD-based SCAR marker linked with smut disease resistance in commercial sugarcane cultivars

Y. B. PAN (1), M. Khan (2), M. P. Grisham (1), J. Iqbal (2). (1) USDA-ARS, SRU, Houma, LA, USA; (2) School of Biological Sciences, Lahore, PAKISTAN

249-P Identification of factors involved in foliar resistance to bacteria in potato

D. A. HALTERMAN (1), P. Basnal (2). (1) USDA ARS, Madison, WI, USA; (2) Madison Area Technical College, Madison, WI, USA

250-P Using decoys to expand the recognition specificity of a plant disease resistance protein

M. HELM, R. W. Innes. Indiana University, Bloomington, IN, USA

251-P Identification of major-gene resistance to *Leptosphaeria maculans* in winter canola cultivars and breeding lines

F. CEVALLOS (1), M. Stamm (2), J. P. Damicone (1). (1) Oklahoma State University, Stillwater, OK, USA; (2) Kansas State University, Manhattan, KS, USA

252-P Understanding the genetic control of quantitative resistance to yellow spot in wheat

E. DINGLASAN (1), D. Singh (1), I. Godwin (2), L. Hickey (1). (1) Queensland Alliance for Agriculture and Food Innovation, Brisbane, AUSTRALIA; (2) The University of Queensland, Brisbane, AUSTRALIA

253-P Quantitative analysis of wilt using time lapse videography

E. LARSON (1), Q. Jiang (2), M. K. Clayton (1), A. O. Charkowski (3). (1) University of Wisconsin-Madison, Madison, WI, USA; (2) Citi Bank, Madison, WI, USA; (3) Colorado State University, Fort Collins, CO, USA

254-P Genotypic and phenotypic evaluation of *Pyrenophora tritici-repentis* isolates for their race structure in South Dakota

S. ABDULLAH, S. Sehgal, K. D. Glover, S. Ali. South Dakota State University, Brookings, SD, USA

255-P Response of wheat cultivars to tan spot against race 1, 5, and unknown race isolates in South Dakota

S. ABDULLAH, S. Sehgal, K. D. Glover, S. Ali. South Dakota State University, Brookings, SD, USA

256-P High-resolution genetic dissection of two disease resistance genes in common bean cultivar Ouro Negro

G. Valentini (1), O. P. Hurtado-Gonzales (2), S. de Lima Castro (1), M. Gonçalves Vidigal (1), Q. Song (2), M. PASTOR-CORRALES (2). (1) Universidade Estadual de Maringá, Maringá, PR, BRAZIL; (2) Soybean Genomics & Improvement Lab, BARC-West, USDA ARS, Beltsville, MD, USA

257-P Identification of markers associated with race-specific resistance to *Aphanomyces* root rot in alfalfa

D. A. SAMAC (1), B. Bucciarelli (1), M. Dornbusch (1),

S. Miller (1), L. X. Yu (2). (1) USDA ARS, St. Paul, MN, USA; (2) USDA ARS, Prosser, WA, USA

258-P Development and evaluation of four molecular markers tightly linked to the *Potato virus Y* resistance gene *Ry^{chc}* in diploid potato populations

A. C. FULLADOLSA (1), S. H. Jansky (2), D. R. Smith (1), C. M. Abramczak (1), A. O. Charkowski (3). (1) University of Wisconsin-Madison, Madison, WI, USA; (2) USDA-ARS, University of Wisconsin-Madison, Madison, WI, USA; (3) Colorado State University, Fort Collins, CO, USA

259-P Development of KASP markers for the identification of *Pea seed-borne mosaic virus* pathotype P-1 resistant alleles of eIF4E in *Pisum sativum*

K. D. Swisher, L. D. PORTER. USDA ARS, Prosser, WA, USA

260-P Managing bacterial wilt disease of tomato in open field conditions by improving host resistance through transgenic approach

S. Kunwar (1), E. da Silva (2), F. B. Iriarte (3), L. Ritchie (2), D. Clark (2), J. H. Freeman (2), R. E. Stall (1), J. B. Jones (4), G. V. Minsavage Jr. (4), C. Zipfel (5), D. M. Horvath (6), M. Paret (7), Q. FAN (2). (1) University of Florida, Gainesville, FL, USA; (2) University of Florida, Quincy, FL, USA; (3) University of Florida - IFAS NFREC, Quincy, FL, USA; (4) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (5) The Sainsbury Laboratory, Norwich, UNITED KINGDOM; (6) Blades Foundation, Evanston, IL, USA; (7) North Florida Research and Education Center, University of Florida, Quincy, FL, USA

261-P Genomic approaches to dissecting *Phytophthora* crown and root rot resistance and applications to strawberry improvement

S. LEE (1), Y. Noh (1), J. A. Mangandi (2), S. Verma (1), V. Whitaker (1). (1) University of Florida, Wimauma, FL, USA; (2) Gulf Coast Research & Education Center, Wimauma, FL, USA

262-P QTL mapping and candidate gene discovery in potato for resistance to the *Verticillium* wilt pathogen *Verticillium dahliae*

A. KUMAR (1), S. H. Jansky (2), J. Endelman (1), D. A. Halterman (3). (1) University of Wisconsin-Madison, Madison, WI, USA; (2) USDA-ARS, University of Wisconsin-Madison, Madison, WI, USA; (3) USDA ARS, Madison, WI, USA

263-P Characterization of *Verticillium dahliae* disease reactions in lettuce differential cultivars

D. P. G. SHORT (1), K. D. Puri (1), G. V. Sandoya (2), I. Simko (3), R. J. Hayes (4,5), K. V. Subbarao (6). (1) University of California-Davis, Salinas, CA, USA; (2) University of Florida, Gainesville, Belle Glade, FL, USA; (3) USDA ARS, Crop Improvement and Protection Unit, Salinas, CA, USA; (4) USDA ARS, Corvallis, OR, USA; (5) USDA ARS, Forage Seed and Cereal Research Unit, Corvallis, OR, USA; (6) University of California-Davis, c/o U.S. Agricultural Research Station, Salinas, CA, USA

264-P Interactions between diverse *Clavibacter michiganensis* subsp. *nebraskensis* isolates and maize inbreds and hybrids influence severity of Goss's wilt

R. R. MCNALLY, B. T. Webster, R. Curland, C. A. Ishimaru, D. K. Malvick. University of Minnesota, St. Paul, MN, USA

265-P Development of a sweet cherry pepper line with resistance to the southern root-knot nematode *Meloidogyne incognita*

W. B. RUTTER, S. Buckner, M. Farnham, R. Fery, C. Kousik. U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA

266-P GBS-SNP-based linkage mapping and QTL associated with resistance to race 1 *Fusarium* wilt in *Cucumis melo*

W. P. WECHTER, S. Branham, A. Levi. USDA ARS, Charleston, SC, USA

267-P Gene expression profiling of resistant vs susceptible tomato (*Solanum lycopersicum*) cultivar after challenging with *Ralstonia solanacearum*

M. DASGUPTA (1), M. R. Sahoo (1), S. V. Ngachan (2). (1) University of Tennessee, Knoxville, TN, USA; (2) ICAR Research Complex for NEH Region, Meghalaya, INDIA

268-P Quantitative trait loci (QTL) conferring resistance in soybean to root rot caused by *Pythium oopapillum*

E. LERCH (1), N. Arritt (1), A. E. Dorrance (2), A. E. Robertson (3). (1) Iowa State University, Ames, IA, USA; (2) The Ohio State University, Wooster, OH, USA; (3) Iowa State University, Department of Plant Pathology, Ames, IA, USA

269-P Physiologic specialization of *Puccinia hordei* on barley in the United States from 2012 to 2016

M. ROUSE. USDA ARS Cereal Disease Laboratory, St. Paul, MN, USA

270-P The Colombian strategy against devastating coffee diseases: Preparation for coffee berry disease (*Colletotrichum kahawae* subsp. *kahawae*)

C. E. MALDONADO, L. Angel, C. P. Florez, C. A. Angel, A. L. Gaitan. CENICAFE, Colombia, Manizales, COLOMBIA

271-P Genetics behind avirulence: The identification of avr-factors in *Magnaporthe oryzae*

D. TATE, T. K. Mitchell. The Ohio State University, Columbus, OH, USA

272-P Identification of markers associated with resistance to *Leptosphaeria maculans* in a collection of *Brassica napus* plant introductions

S. M. MANSOURIPOUR, M. Rahman, L. E. del Rio Mendoza. North Dakota State University, Fargo, ND, USA

Host Resistance Screening

- 273-P Reaction of potato genotypes to infection with *Tomato chlorosis virus* (ToCV)**
L. R. PINTO, D. Bampi, J. A. M. Rezende, A. Bergamin Filho. University of São Paulo - ESALQ, Piracicaba, BRAZIL
- 274-P Reaction of sweet potato genotypes to the root-knot nematode (*Meloidogyne javanica*)**
A. FURTADO SILVEIRA MELLO, R. Souza, A. Macedo, D. Biscaia, A. Moita, R. Lemos, L. Fonseca, J. Pinheiro. EMBRAPA, Brasília, BRAZIL
- 275-P *Tomato spotted wilt virus* (TSWV) on pepper seedlings (*Capsicum annuum*) in a breeding nursery and difference in susceptibility among breeding lines**
B. S. KIM, S. H. Lee. Kyungpook National University, Daegu, REPUBLIC OF (SOUTH) KOREA
- 276-P Assessment of soybean breeding lines for resistance to *Phomopsis* seed decay from field trials in Stoneville, Mississippi**
S. LI (1), J. R. Smith (2). (1) USDA ARS CGRU, Stoneville, MS, USA; (2) USDA ARS, Stoneville, MS, USA
- 277-P Characterization of black walnut genotypes for resistance to thousand cankers disease**
E. LAURITZEN, C. Nischwitz. Utah State University, Logan, UT, USA
- 278-P Host resistance to *Botrytis* bunch rot in *Vitis* spp. and its correlation with *Botrytis* leaf spot**
R. P. NAEGELE. USDA ARS, Parlier, CA, USA
- 279-P Egyptian *Blumeria graminis* f. sp. *tritici* virulence frequencies and powdery mildew resistance of Egyptian wheat cultivars**
A. S. G. ABDEL RHIM (1,2), H. Abd-Allah (2), M. Ismail (2), C. Cowger (3). (1) North Carolina State University, Raleigh, NC, USA; (2) Minia University, El-Minia, EGYPT; (3) USDA ARS, Department of Entomology & Plant Pathology, North Carolina State University, Raleigh, NC, USA
- 280-P Resistance in species of Cucurbitaceae to gummy stem blight caused by *Stagonosporopsis citrulli* under field conditions**
G. RENNBERGER, A. P. Keinath. Coastal Research and Education Center, Clemson University, Charleston, SC, USA
- 281-P Breeding of high quality Korean carrot lines resistant to root-knot nematodes**
Y. H. KIM (1), E. Kim (2), Y. Seo (2), Y. S. Kim (3), Y. Park (3). (1) Seoul National University, Seoul, REPUBLIC OF (SOUTH) KOREA; (2) Department of Agricultural Biotechnology, Seoul National University, Seoul, REPUBLIC OF (SOUTH) KOREA; (3) KC Carrot Breeding Institute, Co. Ltd., Daegu, REPUBLIC OF (SOUTH) KOREA
- 282-P Foliar and tuber reactions of five fresh market potato cultivars with three *Potato virus Y* strains**
D. A. INGLIS (1), B. Gundersen (1), A. Beissinger (2), A. V. Karasev (3). (1) Washington State University-Mount Vernon NWREC, Mount Vernon, WA, USA; (2) University of Connecticut, Storrs, CT, USA; (3) University of Idaho, Moscow, ID, USA
- 283-P Seasonal and potato cultivar effects on pathogenic *Streptomyces* spp.**
K. NAHAR (1), C. Goyer (1), B. Zebarth (1), D. Burton (2), S. Whitney (1). (1) Agriculture and Agri-Food Canada, Fredericton, NB, CANADA; (2) Dalhousie University, Truro, NS, CANADA
- 284-P Interaction of onion cultivar and growth stages on incidence of *Pantoea ananatis* bulb infection**
S. STUMPF (1), R. D. Gitaitis (1), T. W. Coolong (1), C. Riner (2), B. Dutta (1). (1) University of Georgia, Tifton, GA, USA; (2) University of Georgia, Lyons, GA, USA
- 285-P Evaluating host resistance to *Macrophomina* crown rot in strawberry**
J. WINSLOW (1), M. Mazzola (2), G. J. Holmes (1), K. L. Ivors (1). (1) Strawberry Center, California Polytechnic State University, San Luis Obispo, CA, USA; (2) USDA ARS, Wenatchee, WA, USA
- 286-P Resistance of almond cultivars to *Aspergillus flavus* and *A. parasiticus***
J. Moral (1), R. Puckett (2), K. Tomari (3), A. Ortega-Beltran (4), T. M. Gradziel (5), T. J. MICHAILIDES (2). (1) University De Cordoba/University of California-Davis, Parlier, CA, USA; (2) University of California-Davis, Parlier, CA, USA; (3) Kearney Agricultural and Extension Center, Parlier, CA, USA; (4) International Institute of Tropical Agriculture, Ibadan, NIGERIA; (5) Department of Plant Sciences, University of California-Davis, Davis, CA, USA
- 287-P Kiwifruit susceptibility to *Botrytis cinerea* and *Botrytis prunorum* during fruit development in Chile**
D. RIQUELME, H. Valdés, J. P. Zoffoli. Pontificia Universidad Católica de Chile, Santiago, CHILE
- 288-P Susceptibility of dry bean varieties to species of *Fusarium* and *Rhizoctonia* associated with root rot disease**
A. O. ADESEMOYE (1), S. Kodati (1), M. Eskelson (1), R. M. Harveson (2). (1) University of Nebraska-Lincoln, North Platte, NE, USA; (2) University of Nebraska, Panhandle Research & Extension Center, Scottsbluff, NE, USA
- 289-P Resistance to cereal cyst nematode in spring wheat in southeastern Idaho**
P. ENSAFI (1), M. T. Moll (2), J. M. Marshall (2). (1) University of Idaho, Aberdeen, ID, USA; (2) University of Idaho, Idaho Falls, ID, USA
- 290-P Rose rosette disease resistance field trials in north Texas**
M. SHIRES (1), K. Ong (2), D. Byrne (1). (1) Texas A&M University, College Station, TX, USA; (2) Texas A&M University, AgriLife Extension Service, College Station, TX, USA
- 291-P Potential sources of resistance to *Phytophthora* crown rot in *Cucurbita maxima* and *Cucurbita moschata***
K. MANTOOTH (1), J. Ikerd (2), M. K. Mandal (3), S. Kousik (2). (1) Clemson University, Coastal Research and

Education Center, Charleston, SC, USA; (2) U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA; (3) ORISE participant, U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA

292-P Assessing spring wheat for Fusarium head blight susceptibility in Idaho

S. Arcibal (1), J. M. MARSHALL (2). (1) University of Idaho, Aberdeen, ID, USA; (2) University of Idaho, Idaho Falls, ID, USA

Integrated Pest Management

293-P Factors influencing the occurrence of foliar pathogens in commercial watermelon fields in South Carolina in 2015 and 2016

G. RENNBERGER (1), A. P. Keinath (1), P. Gerard (2). (1) Coastal Research and Education Center, Clemson University, Charleston, SC, USA; (2) Department of Mathematical Sciences, Clemson University, Clemson, SC, USA

294-P Evaluation of β -nicotinamide adenine dinucleotide for the potential to manage fungal and bacterial diseases on vegetable crops

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295-P Seed treatments to eradicate *Pyrenopeziza brassicae* from infected mustard (*Brassica juncea*) seed

S. CARMODY, L. du Toit. Washington State University, Mount Vernon, WA, USA

296-P Non-target effects of horticultural and pest management practices in fall and winter on development of *Exobasidium* leaf and fruit spot of blueberry

H. SCHERM (1), R. M. Allen (2), R. J. Ingram (1), P. M. Brannen (1). (1) University of Georgia, Athens, GA, USA; (2) University of Georgia Extension, Alma, GA, USA

297-P Modelling daytime light integral and light quality effects to optimize suppression of powdery mildews by nighttime applications of UV and red light

A. Suthaparan (1), K. A. Solhaug (1), H. R. Gislerød (1), A. STENSVAND (1,2), D. M. Gadoury (3), A. Bierman (4), M. Rea (4). (1) Norwegian University of Life Sciences, Ås, NORWAY; (2) Norwegian Institute of Bioeconomy Research, Ås, NORWAY; (3) Cornell University, Geneva, NY, USA; (4) Lighting Research Center, Rensselaer Polytechnic Institute, Troy, NY, USA

298-P Effect of UV-C/dark treatment on bacterial and fungal microbiome of strawberry fruit

W. J. JANISIEWICZ (1), B. Evans (1), F. Takeda (1), W. M. Jurick II (2), P. Ramachandran (3), E. Reed (3), A. Ottesen (3). (1) USDA-ARS AFRS, Kearneysville, WV, USA; (2) USDA-ARS Food Quality Laboratory, Beltsville, MD, USA; (3) FDA, College Park, MD, USA

299-P Nighttime treatments of ultraviolet (UV) light targeting powdery mildews also suppress the two-spotted spider mite (*Tetranychus urticae*)

N. S. Johansen (1), B. A. Tadesse (1), A. Suthaparan (2),

A. STENSVAND (1), P. J. From (2), D. M. Gadoury (3). (1) Norwegian Institute of Bioeconomy Research, Ås, NORWAY; (2) Norwegian University of Life Sciences, Ås, NORWAY; (3) Cornell University, Geneva, NY, USA

300-P Characterizing *Colletotrichum orbiculare*, the causal agent of cucurbit anthracnose, for fungicide efficacy and host susceptibility in North Carolina

N. NOEL, L. M. Quesada. North Carolina State University, Raleigh, NC, USA

301-P Control of root rot diseases of woody ornamentals using biorational products and fungicides

M. N. Kabir, P. Liyanapathirana, T. Simmons, F. BAYSAL-GUREL. Tennessee State University, McMinnville, TN, USA

302-P Management of *Rhizoctonia* diseases in sugar beet using an integrated approach

A. K. CHANDA (1), J. R. Brantner (2). (1) Department of Plant Pathology, University of Minnesota, Crookston, MN, USA; (2) University of Minnesota, Crookston, MN, USA

303-P Fungicides and cultivars can limit hop downy mildew (*Pseudoperonospora humuli*) in Michigan

D. S. HIGGINS (1), M. K. Hausbeck (2). (1) Michigan State University, Department of Plant, Soil, and Microbial Sciences, East Lansing, MI, USA; (2) Michigan State University, East Lansing, MI, USA

304-P Options for control of Fusarium wilt tropical race 4 in bananas

A. DRENT, J. Henderson. University of Queensland, Brisbane, AUSTRALIA

305-P Progress in managing bacterial spot of cucurbits, caused by *Xanthomonas cucurbitae*

M. BABADOOST, S. Thapa, X. Zhang, S. Sulley. University of Illinois, Urbana, IL, USA

306-P Novel phytosanitary treatment of *Xylella fastidiosa*-infected pecan scions using carbon nanotubes

A. HILTON (1), M. Handiseni (1), W. Choi (1), X. Wang (2), L. J. Grauke (2), C. Yu (1), Y. K. Jo (1). (1) Texas A&M University, College Station, TX, USA; (2) USDA-ARS Pecan Breeding and Germplasm Repository, Somerville, TX, USA

307-P Integration of biopesticides, a SAR inducer, and copper for managing bacterial spot of tomato; a long-term evaluation in production areas in Florida

M. PARET (1,2), P. D. Roberts (3), G. E. Vallad (4), J. H. Freeman (5), S. M. Olson (1), L. Ritchie (5), D. Clark (5). (1) North Florida Research and Education Center, University of Florida, Quincy, FL, USA; (2) University of Florida, Department of Plant Pathology, Gainesville, FL, USA; (3) University of Florida, Immokalee, FL, USA; (4) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA; (5) University of Florida, Quincy, FL, USA

308-P Survey and field efficacy trials to manage bacterial spot of fresh market tomatoes in North Carolina

F. LOUWS (1), P. Adhikari (1), T. B. Adhikari (2), D. Panthee (3), I. Meadows (3). (1) North Carolina State

University, Raleigh, NC, USA; (2) Sakata Seed America Inc., Salinas, CA, USA; (3) North Carolina State University, Mills River, NC, USA

Molecular Plant-Microbe Interactions

- 309-P Cloning of a chitinase gene from *Trichoderma asperellum* and its efficacy against *Alternaria* leaf spot**
R. T. P. Pandian, M. Raja, A. Kumar, P. SHARMA. ICAR-Indian Agricultural Research Institute, New Delhi, INDIA
- 310-P The interaction between the Lon protease and other major regulatory systems in *Erwinia amylovora***
J. H. LEE, Y. Zhao. University of Illinois at Urbana-Champaign, Urbana, IL, USA
- 311-P *Macrophomina phaseolina* promotes charcoal rot susceptibility in sorghum through induced host cell wall-degrading enzymes (CWDEs)**
A. Y. BANDARA, D. K. Weerasooriya, S. Liu, C. R. Little. Kansas State University, Manhattan, KS, USA
- 312-P Dynamics of host glutathione and glutathione-related enzymes in the *Macrophomina phaseolina*-sorghum *bicolor* interaction**
A. Y. BANDARA, D. K. Weerasooriya, S. Liu, C. R. Little. Kansas State University, Manhattan, KS, USA
- 313-P The necrotrophic fungus *Macrophomina phaseolina* induces strong oxidative stress in charcoal rot susceptible sorghum genotypes**
A. Y. BANDARA, D. K. Weerasooriya, S. Liu, C. R. Little. Kansas State University, Manhattan, KS, USA
- 314-P Development of antisense antimicrobials for fire blight management**
Q. ZENG. Department of Plant Pathology & Ecology, The Connecticut Agricultural Experiment Station, New Haven, CT, USA
- 315-P A multi-resistance plasmid transfers at high frequencies among *Pseudomonas syringae***
L. BARDAJI, M. Echeverría, J. Murillo. Universidad Pública de Navarra, Pamplona, SPAIN
- 316-P Direct evidence of *CsLOB1* being the susceptibility gene of citrus canker caused by *Xanthomonas citri***
S. DUAN. University of Florida, Lake Alfred, FL, USA
- 317-P Does *Salmonella enterica* translocate type III effectors into plant cells?**
L. CHALUPOWICZ (1), G. Nissan (2), M. T. Brandl (3), M. McClelland (4), G. Sessa (2), I. Barash (2), S. Manulis-Sasson (1). (1) ARO, The Volcani Center, Rishon LeZion, ISRAEL; (2) Tel Aviv University, Tel Aviv, ISRAEL; (3) Produce Safety and Microbiology Research Unit, Albany, CA, USA; (4) University of California, Irvine, CA, USA
- 318-P Contribution of *dspE* and *eop1* to *Erwinia tracheiphila* virulence**
O. I. OLAKUNLE, M. L. Gleason, G. A. Beattie. Iowa State University, Ames, IA, USA
- 319-P Identification and characterization of plasmids from *Xylella fastidiosa* using next-generation sequencing analyses**
C. VAN HORN (1), F. Wu (2), Z. Zheng (2), J. Chen (1). (1) USDA-ARS-PWA, Parlier, CA, USA; (2) South China Agricultural University, Guangzhou, CHINA
- 320-P Role of cytosine-5 DNA methyltransferases in morphogenesis and virulence of phytopathogen *Cryphonectria parasitica***
J. Bal, Y. H. Ko, K. K. So, D. H. KIM. Chonbuk National University, Jeonju, REPUBLIC OF (SOUTH) KOREA
- 321-P Characterization of a putative tunicamycin gene cluster in *Rathayibacter toxicus***
M. TANCOS, A. Sechler, M. B. McMahon, D. Luster, W. Schneider, E. E. Rogers. USDA ARS FDWSRU, Fort Detrick, MD, USA
- 322-P Characterization of effectors from *Fusarium graminearum***
G. HAO, M. Vaughan, S. McCormick, A. Kelly, T. J. Ward. USDA/ARS/NCAUR, Peoria, IL, USA
- 323-P TsnRNA-IIIb induces citrus dwarfing and alters the hormone profile of the trees**
I. LAVAGI, G. Greer, T. Dang, S. H. Tan, S. Bodaghi, P. E. Rolshausen, C. Lovatt, G. Vidalakis. University of California-Riverside, Riverside, CA, USA
- 324-P Influence of *Xylella fastidiosa* cold shock proteins on pathogenesis in grapevine**
L. BURBANK. USDA-ARS, Parlier, CA, USA
- 325-P Analysis of a virulence gene family of *Pyricularia* from cereal and grass hosts**
D. J. EBBOLE (1), Y. Han (1,2), M. L. Chen (1,2), W. Zheng (1,2), X. Wu (1,2), G. Lu (2), Z. H. Wang (2). (1) Texas A&M University, College Station, TX, USA; (2) Fujian Agriculture and Forestry University, Fuzhou, CHINA
- 326-P *In silico* predictive studies translate into an understanding of complex molecular interactions between pospiviroid pathogens and their tomato host**
R. W. HAMMOND, N. Kovalskaya, N. Kreger, K. Avina-Padilla. USDA ARS, Molecular Plant Pathology Laboratory, Beltsville, MD, USA
- 327-P A five amino acid motif in the *Potato leafroll virus* minor capsid protein regulates local virus movement**
Y. XU, G. Stewart. Cornell University, Ithaca, NY, USA
- 328-P TAL effector PthA4 is required for the hypersensitive response by *Xanthomonas citri* in kumquat**
D. TEPER, N. Wang. University of Florida, Lake Alfred, FL, USA
- 329-P Generating canker-resistant citrus varieties by modification of the citrus canker susceptibility gene *CsLOB1* via Cas9/sgRNA technology**
H. JIA, Y. Zhang, V. Orbovic, J. Xu, N. Wang. Citrus Research and Education Center, University of Florida, Lake Alfred, FL, USA

- 330-P Characterization of a 21 member effector gene family from the rice blast fungus**
M. L. CHEN (1,2), Y. Han (1,2), W. Zheng (1,2), X. Wu (1,2), G. Lu (2), Z. Wang (2), D. J. Ebbola (1). (1) Texas A&M University, College Station, TX, USA; (2) Fujian Agriculture and Forestry University, Fuzhou, CHINA
- 331-P Two citrus viruses encode silencing suppressors to suppress posttranscriptional gene silencing**
S. H. TAN, S. Bodaghi, S. Abuhajar, G. Vidalakis. University of California-Riverside, Riverside, CA, USA
- 332-P *Pseudomonas syringae* pv. *tomato* oxidative stress transcription factor OxyR and sigma factor AlgU play an important role for virulence**
Y. ISHIGA (1), T. Ishiga (1), Y. Ichinose (2). (1) University of Tsukuba, Tsukuba, JAPAN; (2) Okayama University, Okayama, JAPAN
- 333-P AefR transcription factor negatively regulates the virulence of *Pseudomonas syringae* pv. *tomato* DC3000**
T. ISHIGA (1), Y. Ishiga (1), T. Kiyokawa (1), N. Maruyama (1), S. Betsuyaku (1), Y. Ichinose (2), N. Nomura (1). (1) University of Tsukuba, Tsukuba, JAPAN; (2) Okayama University, Okayama, JAPAN
- 334-P *FRN1*, a gene encoding putative GPCR protein, is critical for ear rot and fumonisin biosynthesis in maize pathogen *Fusarium verticillioides***
H. YAN (1), M. Kim (1), J. Huang (2), W. B. Shim (1). (1) Texas A&M University, College Station, TX, USA; (2) Plant Protection College, Fujian Agriculture & Forestry University, Fuzhou, CHINA
- 335-P Characterization of two major facilitator superfamily (MFS) transporters in multi-drug resistance in the citrus fungal pathogen *Alternaria alternata***
K. R. CHUNG. National Chung-Hsing University, Taichung, TAIWAN
- 336-P Chromosomally encoded peroxiredoxin CLIBASIA_00485 of '*Ca. Liberibacter asiaticus*' is a virulence factor needed for survival and colonization of citrus**
M. JAIN, A. Munoz Bodnar, S. Zhang, D. W. Gabriel. University of Florida, Gainesville, FL, USA
- 337-P *Verticillium dahliae* LHS1 is required for virulence and expression of extracellular enzymes involved in cell-wall degradation**
W. Cui, X. Dai, W. GUO. Institute of Food Science and Technology, Chinese Academy of Agricultural Sciences, Beijing, CHINA
- 338-P The involvement of LsGRP1 in salicylic acid-related disease resistance and photosynthesis**
C. A. Chen, C. H. Lin, C. Y. CHEN. National Taiwan University, Taipei, TAIWAN
- 339-P Stringent response regulator DksA positively regulates virulence traits of *Xanthomonas citri***
Y. ZHANG, N. Wang. University of Florida, Lake Alfred, FL, USA
- 340-P Genetic analysis of motility and phytohormone biosynthesis of an endohyphal bacterium from *Rhizoctonia solani***
P. ZHANG, J. C. Huguet-Tapia, F. F. White. University of Florida, Gainesville, FL, USA
- 341-P Screening of secreted in xylem (*SIX*) genes in *Fusarium* wilt pathogens of palms**
S. PONUKUMATI (1), M. L. Elliott (1), J. A. Rollins (2), B. Desjardin (1). (1) University of Florida, Fort Lauderdale, FL, USA; (2) University of Florida, Gainesville, FL, USA
- 342-P Identification and characterization of *Fusarium graminearum* pathogenesis genes**
M. SALAZAR, F. Kolb, S. X. Mideros Mora. (1) University of Illinois at Urbana-Champaign, Urbana, IL, USA
- 343-P Hormone cross-talk in the interaction between '*Candidatus Liberibacter asiaticus*' and citrus rootstock**
J. WU (1), F. Alferez (2), E. G. Johnson (1), J. H. Graham (1). (1) University of Florida, Lake Alfred, FL, USA; (2) University of Florida, Immokalee, FL, USA
- 344-P Investigating sRNA regulation of carbohydrate utilization in *Erwinia amylovora***
E. SWEENEY. Michigan State University, East Lansing, MI, USA
- 345-P A mass spectrometry-based approach to quantitatively measure translocation of multiple type III secretion system effectors**
D. GILLIS. University of Georgia, Department of Plant Pathology, Athens, GA, USA
- 346-P Differential gene expression within *Meloidogyne incognita*: Response to exposure to sub-lethal doses of post-plant nematocides**
C. WRAM (1,2), A. Peetz (2), I. A. Zasada (3). (1) Oregon State University, Corvallis, OR, USA; (2) USDA ARS, Horticultural Crops Research Unit, Corvallis, OR, USA; (3) USDA ARS, Corvallis, OR, USA
- 347-P Evolutionary and biological basis of *Xanthomonas* systemic pathogenesis of plants**
J. M. JACOBS (1), T. Vancheva (2), A. Cerutti (3), J. M. Lang (1), C. Pesce (4), L. Noel (3), C. Allen (5), J. E. Leach (1), B. Szurek (6), S. Cunnac (6), C. G. Bragard (2), R. Koebnik (6). (1) Colorado State University, Fort Collins, CO, USA; (2) Universite Catholique de Louvain, Louvain-la-Neuve, BELGIUM; (3) LIPM Laboratoire des Interactions Plantes Micro Organismes, UMR CNRS/INRA 2594/441, Castanet-Tolosan, FRANCE; (4) University of New Hampshire, Durham, NH, USA; (5) University of Wisconsin, Madison, WI, USA; (6) Institut de Recherche pour le Developpement, Montpellier, FRANCE
- 348-P Live visualization of type III effector activity in stomata and mesophyll cells by *Xanthomonas translucens* during leaf infection**
J. M. JACOBS (1), C. Pesce (2), T. Vancheva (3), F. Bini (4), J. Butchacas (5), G. Hensel (4), I. Otto (4), B. Szurek (5), J. Kumlehn (4), C. G. Bragard (3), R. Koebnik (5). (1) Colorado State University, Fort Collins, CO, USA; (2) University of New Hampshire, Durham, NH, USA; (3) Universite Catholique de Louvain, Louvain-la-Neuve, BELGIUM; (4) Institute for Plant Genetics & Crop Plant Research, Gatersleben, GERMANY; (5) Institut de Recherche pour le Developpement, Montpellier, FRANCE

- 349-P Evolution of avirulence genes in the wheat blast pathogen *Pyricularia graminis-tritici***
V. L. CASTROAGUDIN, S. Sousa Moreira, P. C. Ceresini.
University of Sao Paulo State, Ilha Solteira, SP, BRAZIL
- 350-P AM-toxin and virulence in *Alternaria tenuissima* isolated from apple moldy core**
K. EL FAR, B. A. Latorre, J. P. Zoffoli. Pontificia Universidad Católica de Chile, Santiago, CHILE
- 351-P Small RNA-mediated gene regulation of pathogen and host during wheat stripe rust infection**
N. A. MUETH (1), S. H. Hulbert (2). (1) Washington State University, Pullman, WA, USA; (2) Department of Plant Pathology, Washington State University, Pullman, WA, USA
- 352-P Stop and smell the fungi: Uncovering overlooked roles of volatile metabolites emitted by *Verticillium* species in plant growth and development**
N. LI, S. Kang. The Pennsylvania State University, University Park, PA, USA
- 353-P Multiple roles of *Wheat streak mosaic virus* coat protein in wheat curl mite transmission, disease modulation, and host range extension**
S. TATINENI, A. J. McMechan, G. L. Hein. USDA ARS, University of Nebraska-Lincoln, Lincoln, NE, USA
- 354-P FvLcp1, a novel LysM/chitin-binding protein, is important for ear rot virulence and fumonisin biosynthesis in *Fusarium verticillioides***
H. Zhang (1), M. Kim (1), J. Huang (2), W. B. SHIM (1). (1) Texas A&M University, College Station, TX, USA; (2) Plant Protection College, Fujian Agriculture & Forestry University, Fuzhou, CHINA
- 355-P Development of a virulence model system to assay virulence in *Chromobacterium vaccinii***
E. WIESNER, J. Park, G. Ebadzadsahrai, A. Harrison, S. Soby. Midwestern University, Glendale, AZ, USA
- 356-P Virulence factors regulated by quorum sensing in *Chromobacterium vaccinii***
J. PARK, E. Wiesner, A. Harrison, G. Ebadzadsahrai, S. Soby. Midwestern University, Glendale, AZ, USA
- 357-P The type III effector AvrBst enhances *Xanthomonas perforans* fitness in tomato**
P. ABRAHAMIAN (1,2), S. Timilsina (1,2), G. V. Minsavage Jr. (2), N. Potnis (3), E. M. Goss (2), J. B. Jones (2), G. E. Vallad (1,2). (1) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA; (2) University of Florida, Department of Plant Pathology, Gainesville, FL, USA; (3) Department of Entomology and Plant Pathology, Auburn University, Auburn, AL, USA
- 358-P *Panicum mosaic virus* modulates reactive oxygen species homeostasis in *Brachypodium distachyon***
S. PANT (1), S. Irigoyen (1), S. Christensen (2), J. Sedbrook (3), K. B. G. Scholthof (4), K. K. Mandadi (1). (1) Texas University A&M AgriLife Research & Extension Center, Weslaco, TX, USA; (2) Chemistry Unit, Center of Medical, Agricultural, and Veterinary Entomology, USDA, Gainesville, TX, USA; (3) School of Biological Sciences, Illinois State University, Normal, IL, USA; (4) Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX, USA
- 359-P A novel type III Xop effector in *Xanthomonas cynarae* associated with rapid cell death**
S. Kara (1), S. TIMILSINA (2), M. A. Jacques (3), N. Potnis (4), G. E. Vallad (5), M. Fischer-Le Saux (3), J. C. Hulbert (6), G. V. Minsavage Jr. (2), J. B. Jones (2). (1) University of Florida, Gainesville, FL, USA; (2) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (3) INRA UMR PAVE, Beaucouze Cedex, FRANCE; (4) Department of Entomology and Plant Pathology, Auburn University, Auburn, AL, USA; (5) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA; (6) Department of Chemistry, Physics and Geology, Winthrop University, Rock Hill, SC, USA
- 360-P Pump up the virulence: RND efflux pumps in *Pseudomonas syringae***
N. ECKSHAIN-LEVI (1), B. Kvitko (2), B. A. Vinatzer (1). (1) PPWS Department, Virginia Tech, Blacksburg, VA, USA; (2) University of Georgia, Athens, GA, USA
- 361-P Transcriptomic profiling of watermelon-powdery mildew (*Podosphaera xanthii*) interactions**
M. K. MANDAL (1), S. Haktan (2), C. Kousik (3). (1) ORISE participant, U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA; (2) Virginia Tech, Blacksburg, VA, USA; (3) U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA
- 362-P Influence of the P6 effector protein of *Cauliflower mosaic virus* (CaMV) on the expression and subcellular localization of the CaMV movement protein**
J. E. Schoelz, M. ADHAB. University of Missouri, Columbia, MO, USA
- 363-P Cofactor engineering as a pathogenesis strategy: A *Xanthomonas* secreted effector modifies NAD in planta**
T. Shidore (1), J. Long (2), C. Broeckling (2), J. Kirkwood (2), J. E. Leach (2), L. R. TRIPLETT (1). (1) Connecticut Agricultural Experiment Station, New Haven, CT, USA; (2) Colorado State University, Fort Collins, CO, USA
- 364-P Identifying the host targets of rice blast effector proteins using proximity-dependent biotin labelling**
K. HAYDON, A. Rogers, M. Egan. University of Arkansas, Fayetteville, AR, USA
- 365-P Identification of phloem specific translatome alterations in response to *Tobacco mosaic virus* infection**
T. COLLUM (1), J. N. Culver (1,2). (1) Institute for Bioscience and Biotechnology Research, College Park, MD, USA; (2) Department of Plant Science and Landscape Architecture, University of Maryland, College Park, MD, USA
- 366-P Transcriptional regulation in geminiviruses**
J. GUERRERO, G. Sunter. University of Texas-San Antonio, San Antonio, TX, USA

- 367-P Controlling Sclerotinia stem rot using gene silencing**
M. MCCAGHEY, A. Ranjan, J. Kurczewski, M. Kabbage, D. L. Smith. University of Wisconsin, Madison, WI, USA
- 368-P Functional characterization of potential *Sclerotinia sclerotiorum* candidate virulence genes on canola**
K. CHITTEM, L. E. del Rio Mendoza. North Dakota State University, Fargo, ND, USA
- 369-P Interplay of ascorbate glutathione cycle and redox signaling in host resistance of taro-*Phytophthora* interaction**
M. R. SAHOO (1), M. Dasgupta (1), N. Prakash (2), S. V. Ngachan (3). (1) University of Tennessee, Knoxville, TN, USA; (2) ICAR Research Complex for NEH Region, Imphal, INDIA; (3) ICAR Research Complex for NEH Region, Meghalaya, INDIA
- 370-P Methodology for profiling of phloem translatomes in *Prunus domestica* L. in response to virus infection**
T. COLLUM (1), E. Lutton (2), A. L. Stone (3), D. Sherman (3), W. Schneider (3), C. D. Dardick (2), J. N. Culver (4). (1) Institute for Bioscience and Biotechnology Research, College Park, MD, USA; (2) Appalachian Fruit Research Station, USDA ARS, Kearneysville, WV, USA; (3) USDA ARS FDWSRU, Fort Detrick, MD, USA; (4) Department of Plant Science and Landscape Architecture University of Maryland-College Park, College Park, MD, USA
- 371-P Tomato yellow leaf curl virus C4 protein is a determinant of disease phenotype in tomato**
C. PADMANABHAN (1), Y. Zheng (2), M. Shamimuzzaman (1), Z. Fei (2), K. S. Ling (1). (1) USDA-ARS, Charleston, SC, USA; (2) Boyce Thompson Institute, Ithaca, NY, USA
- 372-P Exploring the trans-acting short-interfering RNAs (ta-siRNAs) technology for virus control in plants**
C. PADMANABHAN (1), Y. Zheng (2), M. Shamimuzzaman (1), Z. Fei (2), K. S. Ling (1). (1) USDA-ARS, Charleston, SC, USA; (2) Boyce Thompson Institute, Ithaca, NY, USA
- 373-P Functional characterization of the triple gene block 1 (TGB1) gene of *Pepino mosaic virus* in tomato**
C. PADMANABHAN (1), Y. Zheng (2), M. Shamimuzzaman (1), Z. Fei (2), K. S. Ling (1). (1) USDA-ARS, Charleston, SC, USA; (2) Boyce Thompson Institute, Ithaca, NY, USA
- 374-P Towards the control of '*Ca. Liberibacter asiaticus*' (Las) by interfering with lytic phage repressors**
A. MUNOZ BODNAR, L. A. Fleites, M. Jain, A. Bernert, D. W. Gabriel. University of Florida, Gainesville, FL, USA
- 375-P C-di-GMP regulates pectate lyase activity through the H-NS-*rsmB*-RsmA pathway in the soft rot bacterial pathogen *Dickeya dadantii***
X. YUAN (1,2), F. Tian (2,3), G. Severin (4), C. Waters (4), F. Liu (1), C. H. Yang (2). (1) Institute of Plant Protection, Jiangsu Academy of Agricultural Sciences, Nanjing, CHINA; (2) Department of Biological Sciences, University of Wisconsin-Milwaukee, Milwaukee, WI, USA; (3) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, CHINA; (4) Department of Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI, USA
- 376-P Transcriptome changes in the whitefly *B. tabaci* in response to feeding on *Cucurbit yellow stunting disorder virus* infected melon**
N. Kaur (1), W. Chen (2), Z. Fei (2), W. M. WINTERMANTEL (1). (1) USDA-ARS, Salinas, CA, USA; (2) Boyce Thompson Institute, Ithaca, NY, USA
- 377-P Transcriptional profiling and phenotypic analysis to identify genes involved in stress response and conidiogenesis in *Fusarium graminearum***
C. Blaschke, Z. O. Bilton, K. Lambert, M. Rothrock, R. Manspeaker, J. FLAHERTY. Coker College, Hartsville, SC, USA
- 378-P Taxonomic reorganization of the family *Endornaviridae***
S. SABANADZOVIC (1), R. A. Valverde (2), M. Khalifa (3), M. N. Pearson (4), R. Okada (5), N. Aboughanem-Sabanadzovic (6). (1) Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, MS, USA; (2) Department of Plant Pathology and Crop Physiology, Louisiana State University AgCenter, Baton Rouge, LA, USA; (3) School of Biological Sciences, The University of Auckland, Auckland, NEW ZEALAND; (4) University of Auckland, Auckland, NEW ZEALAND; (5) Faculty of Agriculture, Tokyo University of Agriculture and Technology, Tokyo, JAPAN; (6) Institute for Genomics, Biocomputing and Biotechnology, Mississippi State University, Mississippi State, MS, USA
- 379-P Influence of reactive oxygen species on the Rcs phosphorelay and its relationship to a large RTX toxin in *Pantoea stewartii***
P. VIRAVATHANA, M. C. Roper. University of California-Riverside, Riverside, CA, USA
- 380-P A role for *Erwinia amylovora* elongation factor P in fire blight disease development**
S. Klee (1), I. Mostafa (2), S. Chen (3), C. Dufresne (4), B. L. Lehman (5), J. P. Sinn (1), K. A. Peter (5), T. W. MCNELLIS (1). (1) Pennsylvania State University, University Park, PA, USA; (2) Zagazig University, Zagazig, EGYPT; (3) University of Florida, Gainesville, FL, USA; (4) Thermo Fisher Scientific, West Palm Beach, FL, USA; (5) Pennsylvania State University, Biglerville, PA, USA
- 381-P Two class I hydrophobins, *TvHyd1* and *TvHyd2*, from *Trichoderma virens***
J. TAYLOR (1), B. A. Horwitz (2), C. M. Kenerley (1). (1) Texas A&M University, College Station, TX, USA; (2) Israel Institute of Technology, Haifa, ISRAEL
- 382-P A coin with two sides: Probing non-pathogenic versus pathogenic interactions using the *Fusarium oxysporum*-*Arabidopsis thaliana* pathosystem**
K. VESCIO, L. Guo, L. J. Ma. University of Massachusetts, Amherst, MA, USA

383-P Functional characterization of ubiquitin carboxyl-terminal hydrolase gene *Moubp1* in *Magnaporthe oryzae*
D. CHEN, X. Yang, Z. Zhao, G. Lu. Fujian Agriculture and Forestry University, Fuzhou, CHINA

384-P Further characterization of OsSULTR3;6 the first susceptibility gene identified for bacterial leaf streak of rice

A. C. READ (1), J. Belanto (2), A. Cernadas (3), L. Wang (1), M. Willmann (4), D. Voytas (2), A. J. Bogdanove (1). (1) Cornell University, Ithaca, NY, USA; (2) University of Minnesota, St. Paul, MN, USA; (3) University of Buenos Aires, Buenos Aires, ARGENTINA; (4) Cornell University Plant Transformation Facility, Ithaca, NY, USA

385-P Effector repertoire of the citrus fungal pathogen *Colletotrichum acutatum*

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386-P Effect of Phymatotrichopsis root rot disease on alfalfa root morphology and forage quality

C. MATTUPALLI, S. Kwon, J. K. Rogers, C. A. Young. The Samuel Roberts Noble Foundation, Ardmore, OK, USA

387-P Infection rate by *Fusarium proliferatum* in aerial garlic bulbils is reduced compared to rate in seed cloves when both originate from infected bulbs

F. M. DUGAN, S. Lupien, B. Hellier. USDA ARS WRPIS, Pullman, WA, USA

388-P Disease interaction of late leaf spot and white mold on peanut

M. MUNIR (1), D. J. Anco (2). (1) Clemson University, Clemson, SC, USA; (2) Clemson University, Blackville, SC, USA

389-P Multivariate analysis of fungal communities associated with diseased winter squash in western Oregon

H. RIVEDAL, A. G. Stone, P. Severns, K. B. Johnson. Oregon State University, Corvallis, OR, USA

390-P *Armillaria altimontana* is not associated with damage to western white pine (*Pinus monticola*) planted in northern Idaho

J. W. Hanna (1), M. V. Warwell (1), G. I. McDonald (1), M. S. Kim (2), B. M. Lalande (3), J. E. STEWART (3), N. B. Klopfenstein (1). (1) Rocky Mountain Research Station, USDA Forest Service, Moscow, ID, USA; (2) Kookmin University, Seoul, REPUBLIC OF (SOUTH) KOREA; (3) Colorado State University, Fort Collins, CO, USA

391-P Influence of temperature and moisture on germination of *Cercospora kaki*, causal agent of persimmon angular leaf spot

R. FERNANDES ALVES, M. Bellato Spósito. University of São Paulo, Piracicaba, BRAZIL

392-P Phylogeny of Northern Hemisphere *Armillaria* and *Desarmillaria*: Neighbor-net and Bayesian analyses of translation elongation factor 1- ϕ gene sequences

M. S. KIM (1), J. E. Stewart (2), J. W. Hanna (3), N. B. Klopfenstein (3). (1) Kookmin University, Seoul, REPUBLIC OF (SOUTH) KOREA; (2) Colorado State University, Fort Collins, CO, USA; (3) Rocky Mountain Research Station, USDA Forest Service, Moscow, ID, USA

393-P Microfungi associated with diseases on *Theobroma cacao* L. in Merida state, Venezuela

S. MOHALI-CASTILLO (1), J. E. Stewart (2). (1) Universidad de Los Andes. Facultad de Ciencias Forestales y Ambientales, Merida, VENEZUELA; (2) Colorado State University, Fort Collins, CO, USA

394-P Effects of soil conditions on root rot of soybean caused by *Fusarium graminearum*

D. R. CRUZ, D. A. Mayfield, G. P. Munkvold, L. F. S. Leandro. Iowa State University, Ames, IA, USA

395-P The effect of temperature and wounding on resistance of ornamental grasses to *Sclerotinia sclerotiorum*

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396-P Distribution of AM fungi in coal mine soils associated with four forest tree species of North Telangana region

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397-P *Alternaria* species causing moldy core of apple in Chile

K. ELFAR, B. A. Latorre, J. P. Zoffoli. Pontificia Universidad Católica de Chile, Santiago, CHILE

398-P Transmission of mycoviruses of *R. solani* and effects on fungal growth

T. J. STETINA, I. E. Tzanetakis. University of Arkansas, Fayetteville, AR, USA

399-P Isolation of *Diaporthe longicolla* from asymptomatic sunflower root

A. ADHIKARI, T. Olson, B. Kontz, F. M. Mathew. South Dakota State University, Brookings, SD, USA

400-P Discovery of multiple sexual cycles in a rust fungus alternating between *Berberis fendleri* and *Elymus glaucus*

Y. JIN (1), G. Cisar (2). (1) USDA-ARS Cereal Disease Laboratory, St. Paul, MN, USA; (2) Cornell University, Loveland, CO, USA

401-P Interceptions of fungal pathogens from grass seed imported to Oregon

J. J. QIU. USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Portland, OR, USA

Nematology

402-P Species and population densities of stubby root nematodes from multiple states in the United States

G. YAN (1), D. Huang (1), A. Plaisance (1), N. C. Gudmestad (1), J. L. Whitworth (2), K. Frost (3), C. R. Brown

(4), W. Ye (5), P. A. Agudelo (6), W. T. Crow (7), S. L. Hafez (8). (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, USA; (2) USDA-ARS, Aberdeen, ID, USA; (3) Oregon State University, Hermiston Agricultural Research & Extension Center, Hermiston, OR, USA; (4) USDA-ARS, Prosser, WA, USA; (5) North Carolina Department of Agriculture & Consumer Services, Raleigh, NC, USA; (6) Clemson University, Plant and Environmental Sciences Department, Clemson, SC, USA; (7) University of Florida, Entomology and Nematology Department, Gainesville, FL, USA; (8) University of Idaho, Parma Research and Extension Center, Parma, ID, USA

403-P Changes in vertical distribution of *Pratylenchus crenatus* associated with corn in Ohio

A. C. M. SIMON (1), T. L. Niblack (1), R. Lewandowski (2), P. A. Paul (3). (1) The Ohio State University, Columbus, OH, USA; (2) Ohio State University Extension, Athens, OH, USA; (3) Ohio State University, Ohio Agricultural Research and Development Center, Department of Plant Pathology, Wooster, OH, USA

404-P Response of cotton cultivars with varying levels of resistance to *Meloidogyne incognita* to irrigation

J. E. WOODWARD (1), R. Roper (2), T. Wheeler (3). (1) Texas A&M University AgriLife Extension Service, Lubbock, TX, USA; (2) Texas Tech University, Lubbock, TX, USA; (3) Texas A&M University AgriLife Research, Lubbock, TX, USA

405-P Evaluating fertilizer effect on the interaction between *Fusarium proliferatum* and soybean cyst nematode on soybean

P. N. OKELLO (1), S. Osborne (2), J. Kleinjan (1), F. M. Mathew (1). (1) South Dakota State University, Brookings, SD, USA; (2) USDA ARS, Brookings, SD, USA

406-P Association mapping of resistance to *Heterodera glycines* within the USDA core collection of common bean

S. JAIN (1), S. Poromarto (2), J. Osorno (3), B. D. Nelson (4). (1) North Dakota State University, Fargo, ND, USA; (2) Agrotechnology, Sebelas Maret University, Surakarta, INDONESIA; (3) Plant Sciences 7670, North Dakota State University, Fargo, ND, USA; (4) Plant Pathology 7660, North Dakota State University, Fargo, ND, USA

New and Emerging Diseases

407-P Characterization of a new tymovirus from Ecuador

K. GREEN (1), D. S. Mollov (2), D. F. Quito-Avila (3), A. V. Karasev (1). (1) University of Idaho, Moscow, ID, USA; (2) USDA, Beltsville, MD, USA; (3) Prometeo, CIBE-ESPOL, Guayaquil, ECUADOR

408-P Complete nucleotide sequence and genome organization of a novel filamentous virus from alfalfa (*Medicago sativa*)

L. G. NEMCHINOV (1), S. Grinstead (2), D. S. Mollov (3). (1) USDA ARS MPPL, Beltsville, MD, USA; (2) USDA-ARS-NGRL, Beltsville, MD, USA; (3) USDA, Beltsville, MD, USA

409-P A new virus complex in babaco (*Carica pentagona*) shows evolutionary relationships with two viruses involved in meleira disease of papaya (*C. papaya*)

J. F. Cornejo (1), R. A. Alvarez-Quinto (2,3), D. QUITO-AVILA (4,5). (1) Escuela Superior Politecnica del Litoral, Guayaquil, ECUADOR; (2) CIBE-ESPOL, Guayaquil, ECUADOR; (3) Centro de Investigaciones Biotecnologicas del Ecuador, Guayaquil, ECUADOR; (4) Escuela Superior Politecnica del Litoral, Facultad Ciencias de la Vida, Guayaquil, ECUADOR; (5) Escuela Superior Politecnica del Litoral, CIBE-ESPOL, Guayaquil, ECUADOR

410-P Five *Fusarium* species associated with root rot and sudden death of industrial hemp in Nevada

J. Schoener, R. Wilhelm, R. Rawson, P. Schmitz, S. WANG. Nevada Department of Agriculture, Sparks, NV, USA

411-P First detection for *Fusarium oxysporum* and *F. solani* causing wilt of medical marijuana plants in Nevada

J. Schoener, R. Wilhelm, R. Rawson, P. Schmitz, S. WANG. Nevada Department of Agriculture, Sparks, NV, USA

412-P The blueberry stem and twig blight complex in New Jersey

J. J. POLASHOCK. USDA ARS, Chatsworth, NJ, USA

413-P New virus from the family *Tombusviridae* infecting sugarcane

M. N. Tahir (1), S. Grinstead (2), D. S. MOLLOV (3). (1) USDA ARS, Beltsville, MD, USA; (2) USDA-ARS-NGRL, Beltsville, MD, USA; (3) USDA, Beltsville, MD, USA

414-P First report of *Armillaria* spp. infecting citrus trees on sour orange rootstock in the Lower Rio Grande Valley, Texas

M. KUNTA, P. Vedasharan, J. W. Park, E. Louzada. Texas A&M University Kingsville Citrus Center, Weslaco, TX, USA

415-P A dieback disease affecting blackberry in North Carolina

J. Mercier, P. WIESE, K. Cobaugh. Driscoll Strawberry Associates, Watsonville, CA, USA

416-P *Pseudomonas viridiflava*: A potential emerging pathogen associated with bacterial canker of plum trees in the Western Cape, South Africa

K. BOPHELA (1), Y. Petersen (2), J. Roux (1), T. Coutinho (1). (1) University of Pretoria, Pretoria, SOUTH AFRICA; (2) Agricultural Research Council, Stellenbosch, SOUTH AFRICA

417-P First detection of two new, unnamed root-lesion nematodes *Pratylenchus* spp. on soybean in North Dakota

G. YAN (1), D. Huang (1), A. Plaisance (1), Z. A. Handoo (2). (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, USA; (2) USDA-ARS, Mycology and Nematology Genetic Diversity and Biology Laboratory, Beltsville, MD, USA

418-P First detection of the spiral nematode *Helicotylenchus microlobus* on soybean in North Dakota

G. YAN (1), D. Huang (1), A. Plaisance (1), Z. A. Handoo (2). (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, USA; (2) USDA-ARS, Mycology and Nematology Genetic Diversity and Biology Laboratory, Beltsville, MD, USA

- 419-P** *Neofusicoccum australe*, *N. luteum*, and *N. mediterraneum* are new blight and canker pathogens of coast redwood (*Sequoia sempervirens*) in California
S. G. AĆIMOVIĆ (1,2), S. N. Rooney-Latham (3), D. M. Grosman (2), J. J. Docola (2). (1) Cornell University, Hudson Valley Research Laboratory, Highland, NY, USA; (2) Research and Development Laboratory, Arborjet Inc., Woburn, MA, USA; (3) California Department of Food & Agriculture, Sacramento, CA, USA
- 420-P** Identification of the *Constricta yellow dwarf virus* strain of *Potato yellow dwarf virus* in field grown peppers and tomatoes in Maryland
J. HAMMOND (1), J. Stommel (2), M. Reinsel (1), C. Gulbranson (3), M. M. Goodin (4). (1) USDA ARS, Floral and Nursery Plants Research Laboratory, Beltsville, MD, USA; (2) USDA ARS, Genetic Improvement of Fruits & Vegetables Laboratory, Beltsville, MD, USA; (3) USDA ARS Electron and Confocal Microscopy Unit, Beltsville, MD, USA; (4) University of Kentucky, Department of Plant Pathology, Lexington, KY, USA
- 421-P** *Zucchini tigré mosaic virus*, an emerging potyvirus in cucurbit vegetables in South Asian countries
B. Bagewadi (1), K. Nagendran (2), R. B. Khadka (3), G. Karthikeyan (4), M. S. Hossain (5), L. Shah (6), A. C. Fayad (7), R. NAIDU (1). (1) Washington State University-Prosser, Prosser, WA, USA; (2) ICAR-Indian Institute of Vegetable Research, Varanasi, INDIA; (3) Khajura Regional Agriculture Research Station, Khajura, Banke, NEPAL; (4) Tamil Nadu Agricultural University, Madurai, INDIA; (5) Horticulture Research Center, Gazipur, BANGLADESH; (6) iDE, Kathmandu, NEPAL; (7) Virginia Polytechnic Institute and State University, Blacksburg, VA, USA
- 422-P** First report of bacterial leaf streak of corn caused by *Xanthomonas vasicola* in Oklahoma
J. P. DAMICONE, F. Cevallos, J. D. Olson. Oklahoma State University, Stillwater, OK, USA
- 423-P** Current assessment of *Xanthomonas citri* subsp. *malvacearum* race designation in Texas cotton
J. E. WOODWARD (1), T. Wheeler (2), T. S. Isakeit (3), K. Ong (4), R. Bart (5), A. Phillips (5). (1) Texas A&M University AgriLife Extension Service, Lubbock, TX, USA; (2) Texas A&M University AgriLife Research, Lubbock, TX, USA; (3) Texas A&M University, College Station, TX, USA; (4) Texas A&M University AgriLife Extension Service, College Station, TX, USA; (5) Donald Danforth Plant Science Center, St. Louis, MO, USA
- 424-P** Identification of a novel bipartite begomovirus isolated from *Lycianthes biflora* in China
Z. HE, Y. Tang. Plant Protection Research Institute, Guangdong Academy of Agricultural Sciences, Guangzhou, CHINA
- 425-P** A new potyvirus found in *Dioscorea bulbifera* in Florida
K. DEY (1), M. J. Melzer (2), C. Kerr (1), C. Li (1), X. Sun (1), S. T. Adkins (3). (1) Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA; (2) University of Hawaii, Honolulu, HI, USA; (3) USDA ARS USHRL, Fort Pierce, FL, USA
- 426-P** Report and characterization of bacterial diseases caused by *Xanthomonas oryzae* in Senegal
H. Tall (1), K. Noba (2), B. Szurek (3), S. Cunnac (3), C. Tekete (4), V. M. VERDIER (5). (1) ISRA, Dakar, SENEGAL; (2) UCAD, Dakar, SENEGAL; (3) Institut de Recherche pour le Développement, Montpellier, FRANCE; (4) LBMA, USTTB, Bamako, Mali, Bamako, MALI; (5) IRD, Cirad, University of Montpellier, IPME, Montpellier, FRANCE
- 427-P** Survey of spinach leaf spot diseases in Texas
B. LIU (1), C. Feng (1), A. Manley (1), R. Garcia Rodriguez (1), L. Stein (2), K. Cochran (3), L. du Toit (4). (1) University of Arkansas, Fayetteville, AR, USA; (2) Department of Horticulture, Uvalde, TX, USA; (3) Texas A&M University, Uvalde, TX, USA; (4) Washington State University, Mount Vernon, WA, USA
- 428-P** A hunt for novel pathogens in cranberries
Z. ZALEWSKI, P. S. McManus. University of Wisconsin-Madison, Madison, WI, USA
- 429-P** A new virus disease of sunflower in Nebraska
R. M. HARVESON (1), M. Al Rwahnih (2), T. Tian (3), A. V. Karasev (4), T. Gulya (5). (1) University of Nebraska, Panhandle Research & Extension Center, Scottsbluff, NE, USA; (2) Department of Plant Pathology, University of California, Davis, CA, USA; (3) California Department of Food & Agriculture, Sacramento, CA, USA; (4) University of Idaho, Moscow, ID, USA; (5) USDA-ARS, Northern Crop Science Laboratory, Fargo, ND, USA
- 430-P** Bacterial wilt outbreaks of multiple sequevars on blueberries in Florida
D. J. NORMAN (1), A. M. Bocsanczy (1), P. Harmon (2), C. Lapaire Harmon (3), A. Khan (4). (1) University of Florida MREC, Apopka, FL, USA; (2) University of Florida, Department of Plant Pathology, Gainesville, FL, USA; (3) University of Florida PDC, Gainesville, FL, USA; (4) University of Florida, Orlando, FL, USA
- 431-P** Status of huanglongbing (HLB) multi-agency coordination (MAC) projects on thermal treatment of citrus trees with citrus greening (2017)
D. A. KOMM (1), R. Ehsani (2), P. Ravenna (3). (1) USDA, Raleigh, NC, USA; (2) University of Florida, Lake Alfred, FL, USA; (3) Ag Harvester, Au Gres, MN, USA
- 432-P** An assessment of putative foliar pathogens on different accessions of tea grown in Florida
J. ORROCK, K. Kemfert, K. Sandsted, R. Healy, B. Spakes Richter, B. Rathinasabapathi. University of Florida, Gainesville, FL, USA
- 433-P** Molecular characterization of a new member of the genus *Waikavirus*
T. Thekke Veetil (1), T. Ho (2), J. D. Postman (3), I. E. TZANETAKIS (1). (1) University of Arkansas, Fayetteville, AR, USA; (2) Driscoll's, Watsonville, CA, USA; (3) USDA ARS, Corvallis, OR, USA
- 434-P** Phylogenetic relationship of *Grapevine vein clearing virus* isolates in wild plant species and in cultivated grapevines
S. PETERSEN, C. Keith, K. Austin, W. Qiu. Missouri State University, Springfield, MO, USA

435-P A species of *Pestalotiopsis* identified infecting red mangrove in the Bahamas
R. E. ROSSI (1), C. A. Layman (2), J. B. Ristaino (1). (1) North Carolina State, Raleigh, NC, USA; (2) North Carolina State University, Department of Applied Ecology, Raleigh, NC, USA

436-P Identification of a caulimo-like virus in pistachio via high-throughput sequencing
A. DIAZ LARA (1), K. Stevens (2), N. Westrick (1), D. A. Golino (3), M. Al Rwahnih (1). (1) Department of Plant Pathology, University of California-Davis, Davis, CA, USA; (2) Foundation Plant Services, University of California-Davis, Davis, CA, USA; (3) University of California, Davis, CA, USA

437-P Characterizing *Sclerotinia sclerotiorum* as the cause of white rot on short-day strawberry cultivars in the Mid-Atlantic region
E. HELLMAN (1), E. Koivunen (2), C. L. Swett (1). (1) University of California-Davis, Davis, CA, USA; (2) Plant Sciences, Inc., Watsonville, CA, USA

438-P Characterization of Tomato leaf curl purple vein virus, a new monopartite New World begomovirus infecting tomato in Northeast Brazil
M. MACEDO (1), L. Albuquerque (2), M. Maliano (1), J. Souza (1), M. Rojas (1), R. L. Gilbertson (1), A. K. Inoue-Nagata (3,4). (1) University of California-Davis, Davis, CA, USA; (2) Goiano Federal Institute, Morrinhos, BRAZIL; (3) EMBRAPA, Brasilia, BRAZIL; (4) Embrapa Vegetables, Gama, BRAZIL

439-P Sugarcane (*Saccharum* spp.) and itch grass (*Rottboellia cochinchinensis*): New hosts to Maize yellow mosaic virus (genus *Polevirus*)
A. YAHAYA (1), M. Al Rwahnih (2), D. B. Dangora (1), L. Gregg (3), M. D. Alegbejo (1), P. L. Kumar (4), O. J. Alabi (5). (1) Ahmadu Bello University, Zaria, NIGERIA; (2) Department of Plant Pathology, University of California-Davis, Davis, CA, USA; (3) Department of Plant Pathology and Microbiology, Texas A&M University AgriLife Research and Extension Center, Weslaco, TX, USA; (4) International Institute of Tropical Agriculture, Ibadan, NIGERIA; (5) Department of Plant Pathology & Microbiology, Texas A&M University, Weslaco, TX, USA

440-P Survival of the Goss's wilt pathogen, *Clavibacter michiganensis* subsp. *nebraskensis*, on maize leaf residue in Central and South Texas
T. S. ISAKEIT (1), G. Steele (2), S. Halfmann (3). (1) Texas A&M University, College Station, TX, USA; (2) Monsanto, Hillsboro, TX, USA; (3) Monsanto, College Station, TX, USA

441-P Differential accumulation and transmission of traditional and emergent *Beet curly top virus* strains from the western United States
W. M. WINTERMANTEL (1), L. Hladky (1), A. Cortez (1), L. F. Chen (2), R. L. Gilbertson (2). (1) USDA-ARS, Salinas, CA, USA; (2) University of California, Davis, CA, USA

442-P Rapid research response to emerging wheat stem rust pathogen races in Ethiopia
B. Girma (1), W. Denbel (2), E. Hailu (3), P. D. Olivera Firpo (4), M. S. Newcomb (5), Y. Jin (6), D. Hodson (7), A. Badebo (7), B. Abeyo (7), G. Wolderufael (3), B. Hundie (8), G. Cisar (9), M. ROUSE (6). (1) Cornell University, Kulumsa, ETHIOPIA; (2) Ethiopian Institute of Agricultural Research, Debre Zeit, ETHIOPIA; (3) Ethiopian Institute of Agricultural Research, Ambo, ETHIOPIA; (4) University of Minnesota, St. Paul, MN, USA; (5) University of Arizona, Maricopa, AZ, USA; (6) USDA-ARS Cereal Disease Laboratory, St. Paul, MN, USA; (7) CIMMYT, Addis Ababa, ETHIOPIA; (8) Ethiopian Institute of Agricultural Research, Kulumsa, ETHIOPIA; (9) Cornell University, Loveland, CO, USA

443-P Viral metagenomics unravels the etiology of lethal necrosis of St. Augustinegrass 'Floritam'
R. I. ALCALÁ-BRISEÑO, P. Harmon, J. Polston. Department of Plant Pathology, University of Florida, Gainesville, FL, USA

444-P Identifying the causal agent of the rotten rhizome syndrome in Achira (*Canna edulis*)
P. URIBE, M. C. Ortega. Corporación Colombiana de Investigación Agropecuaria, Pasto, COLOMBIA

Oomycete

445-P Charles Darwin and the Irish Potato Famine: "A painfully interesting subject"
J. B. BEAGLE (1), D. Pfister (2). (1) North Carolina State University, Raleigh, NC, USA; (2) Harvard University, Cambridge, MA, USA

446-P Assessing the potential for *Phytophthora* to move between native plant nurseries and interstate shipping nurseries
T. Miles (1), W. Schweigkofler (2), S. Sharma (2), N. Luecke (1), K. L. Kosta (3), K. G. SUSLOW (2). (1) California State University-Monterey Bay, Seaside, CA, USA; (2) Dominican University of California, San Rafael, CA, USA; (3) California Department of Food & Agriculture, Sacramento, CA, USA

447-P Distribution of root rot on pea and lentil crops on the Canadian prairies, 2016
B. D. GOSSEN (1), S. G. Chatterton (2), D. L. McLaren (3). (1) Agriculture & Agri-Food Canada, Saskatoon, SK, CANADA; (2) Agriculture & Agri-Food Canada, Lethbridge, AB, CANADA; (3) Agriculture & Agri-Food Canada, Brandon, MB, CANADA

448-P Viability of resting spores of *Plasmodiophora brassicae* throughout the soil profile
F. Al-Daoud (1), B. D. Gossen (2), M. R. MCDONALD (1). (1) University of Guelph, Guelph, ON, CANADA; (2) Agriculture & Agri-Food Canada, Saskatoon, SK, CANADA

449-P *Phytophthora* species present in two Missouri Ozark valleys with white oak mortality
S. E. REED, J. T. English, R. M. Muzika. University of Missouri, Columbia, MO, USA

450-P The risk of seedling disease of corn caused by *Pythium* increases with proximity of the corn seedling to terminated winter rye cover crop plants

J. N. ACHARYA (1), T. Kaspar (2), A. Lenssen (3), A. E. Robertson (1). (1) Iowa State University, Department of Plant Pathology, Ames, IA, USA; (2) USDA ARS National Soil Tilth Lab, Ames, IA, USA; (3) Iowa State University, Department of Agronomy, Ames, IA, USA

451-P Incidence of *Phytophthora* in Maryland nurseries

R. R. POKHAREL. Maryland Department of Agriculture, Annapolis, MD, USA

452-P Survival of *Peronospora belbahrii* sporangia isolated from host plant tissue

K. S. ALLEN, G. Higgins, L. J. Ma, R. L. Wick. University of Massachusetts-Amherst, Amherst, MA, USA

453-P Susceptibility to infection of soybean by *P. sylvaticum* depends on germination stage

R. L. MATTHIESEN (1), A. E. Robertson (2). (1) Iowa State University, Ames, IA, USA; (2) Iowa State University, Department of Plant Pathology, Ames, IA, USA

454-P Historical pattern of *Phytophthora* species associated with *Abies* root rot in Pennsylvania

J. E. Kim (1), E. V. NIKOLAEVA (2), T. N. Olson (2), S. Kang (1), S. H. Kim (2). (1) Pennsylvania State University, University Park, PA, USA; (2) Pennsylvania Department of Agriculture, Harrisburg, PA, USA

Outreach and Engagement

455-P Exciting changes for the *Journal of Environmental Horticulture*

J. CALABRO (1), J. Derr (2). (1) AmericanHort/HRI, Washington, DC, USA; (2) Weed Science Society of America, Virginia Beach, VA, USA

456-P Survey and awareness plan for identification and management of clubroot on canola in North Dakota

V. CHAPARA (1), N. Kalwar (1), L. Lubenow (1), A. Chirumamilla (2). (1) North Dakota State University, Langdon, ND, USA; (2) Langdon, ND, USA

457-P A model for sustainable IPM technology transfer in Nepal

A. C. FAYAD (1), R. N. Muniappan (1), L. Shah (2). (1) Virginia Polytechnic Institute and State University, Blacksburg, VA, USA; (2) International Development Enterprises iDE, Lalitpur, Kathmandu, NEPAL

458-P An abridged technique to determine *Phyllocoptes fructiphilus* populations on roses endangered by rose rosette disease

S. COLLINS (1), K. Solo (1), A. S. Windham (2), F. Hale (2), Q. Cheng (1), M. T. Windham (1). (1) University of Tennessee, Knoxville, TN, USA; (2) Soil, Plant, and Pest Center, Nashville, TN, USA

459-P Engaging non-traditional and online students in Ohio State's Master in Plant Health Management: A SWOT analysis

M. M. LEWANDOWSKI (1), A. E. Dorrance (2), L.

Canas (3), C. Welty (4), F. Peduto Hand (1), D. Shetlar (4), P. A. Paul (5), A. Londo (6), S. D. Ellis-Williams (1), W. Klooster (4). (1) Ohio State University, Department of Plant Pathology, Columbus, OH, USA; (2) The Ohio State University, Wooster, OH, USA; (3) Ohio State University, Ohio Agricultural Research and Development Center, Department of Entomology, Wooster, OH, USA; (4) Ohio State University, Department of Entomology, Columbus, OH, USA; (5) Ohio State University, Ohio Agricultural Research and Development Center, Department of Plant Pathology, Wooster, OH, USA; (6) Ohio State University Extension, Columbus, OH, USA

460-P News and 2016 activities of the Clemson University Plant Problem Clinic

M. WILLIAMSON. Clemson University, Department of Plant Industry, Pendleton, SC, USA

461-P The Sunflower Pathology Working Group

S. G. MARKELL (1), R. M. Harveson (2), C. C. Block (3), T. Gulya (4), F. M. Mathew (5), S. Thompson (6). (1) North Dakota State University, Fargo, ND, USA; (2) University of Nebraska, Panhandle Research & Extension Center, Scottsbluff, NE, USA; (3) Iowa State University, Ames, IA, USA; (4) USDA-ARS, Northern Crop Science Laboratory, Fargo, ND, USA; (5) South Dakota State University, Brookings, SD, USA; (6) University of Southern Queensland, Toowoomba, AUSTRALIA

462-P Volunteerism in international development: Disease notes from abroad

J. C. HIMMELSTEIN. ACIDI/VOCA, Washington, DC, USA

Pathogen Dispersal

463-P Relative abundance of *Potato virus Y* strains in commercial potato fields of the Columbia Basin, 2011 to 2015

C. FUNKE, O. V. Nikolaeva, K. Green, L. Tran, A. V. Karasev. University of Idaho, Moscow, ID, USA

464-P Spread of bacterial leaf spot (*Xanthomonas perforans*) among tomato seedlings in the greenhouse

K. Hernandez, S. Sharpe, I. MEADOWS. North Carolina State University, Mills River, NC, USA

465-P Transmission of *Monilinia fruticicola* genotypes from blossoms to twigs

M. DOWLING (1), B. Cox (1), T. Sroka (1), J. Wilson (2), G. Schnabel (1). (1) Clemson University, Clemson, SC, USA; (2) Cornell University, Ithaca, NY, USA

466-P Investigating the dispersal efficiency of pathogens causing potato early blight and brown spot

S. DING, D. Rouse, K. Meinholz, A. J. Gevens. University of Wisconsin-Madison, Madison, WI, USA

467-P Incidence of silverleaf disease caused by *Chondrostereum purpureum* in apple nursery plants

A. FRANCE, D. Grinbergs, J. Chilian. INIA Quilamapu, Chillan, CHILE

468-P Transmission efficiency of *Cucumber green mottle mosaic virus* via soil

C. LIANG (1,2,3,4), X. A Bie (1,2), L. Luo (1,2), J. Li

(1,2), B. Baker (3,4). (1) China Agricultural University, Beijing, CHINA; (2) Beijing Key Laboratory of Seed Disease Testing and Control, Beijing, CHINA; (3) Department of Plant and Microbial Biology, University of California-Berkeley, Berkeley, CA, USA; (4) Plant Gene Expression Center, USDA-ARS, Albany, CA, USA

469-P Epidemic network analysis for mitigation of invasive pathogens in seed systems: Potato in Ecuador

C. BUDDENHAGEN (1,2,3), J. F. Hernandez Nopsa (1,2,3), K. F. Andersen (1,2,3), J. L. Andrade-Piedra (4), P. Kromann (5), G. A. Forbes (6), S. Thomas-Sharma (7), K. A. Garrett (1,2,3). (1) University of Florida, Plant Pathology Department, Gainesville, FL, USA; (2) Institute for Sustainable Food Systems, Gainesville, FL, USA; (3) Emerging Pathogens Institute, Gainesville, FL, USA; (4) International Potato Center (CIP), Lima, PERU; (5) International Potato Center, Quito, ECUADOR; (6) International Potato Center, Servas, FRANCE; (7) Plant Pathology Department, Manhattan, KS, USA

470-P Pollen can spread *Colletotrichum acutatum* among citrus flowers

M. C. DE GODOY GASPAROTO (1), A. B. Gama (2), S. de Afonseca Lourenço (2), G. J. Silva Junior (3), L. Amorim (2). (1) UNESP, Registro, BRAZIL; (2) USP, Piracicaba, BRAZIL; (3) FUNDECITRUS, Araraquara, BRAZIL

471-P Assessment of the presence of *Plasmodiophora brassicae* viable inoculum in the irrigation sediments in the savannah of Bogota

J. S. Navas Martínez, A. BOTERO RAMIREZ, D. J. Urbano Muñoz, J. S. Urquijo Ruiz, C. García. Universidad Nacional de Colombia, Bogotá, COLOMBIA

472-P Assessment of the vertical and horizontal distribution of *Plasmodiophora brassicae* in soil

L. Tarazona, A. BOTERO RAMIREZ, C. García. Universidad Nacional de Colombia, Bogotá, COLOMBIA

473-P Environmental factors impact temporal *Passalora sequoiae* conidia counts from Leyland cypress

J. L. Williams-Woodward (1), W. E. COPES (2). (1) University of Georgia, Department of Plant Pathology, Athens, GA, USA; (2) USDA ARS, Poplarville, MS, USA

474-P Germination of oospores of the impatiens downy mildew at different temperatures

N. SHISHKOFF. USDA ARS FDWSRU, Frederick, MD, USA

475-P Lack of pheromone reduces nematode dispersal

A. PERRET-GENTIL (1), A. Miri (1), J. Giurintano (1), E. Sampson (1), X. Gao (1), D. I. Shapiro-Ilan (2), F. Kaplan (1). (1) Pheronym, Inc., Gainesville, FL, USA; (2) USDA/ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA

476-P Elevated temperature reduces seed-to-seedling transmission of bacterial fruit blotch of cucurbits caused by *Acidovorax citrulli*

M. ZHAO, R. R. Walcott. The University of Georgia, Athens, GA, USA

477-P Analyzing key nodes and epidemic risk in seed networks:

Sweetpotato in northern Uganda

K. F. ANDERSEN (1,2,3), C. Buddenhagen (1,2,3), P. Rachkara (4), R. Gibson (5), S. Kalule (4), D. Phillips (5), K. A. Garrett (12,3). (1) University of Florida, Plant Pathology Department, Gainesville, FL, USA; (2) Institute for Sustainable Food Systems, Gainesville, FL, USA; (3) Emerging Pathogens Institute, Gainesville, FL, USA; (4) Department of Rural Development and Agribusiness, Gulu, UGANDA; (5) Natural Resource Institute, Greenwich, UNITED KINGDOM

478-P A network model to predict spread and mesoscale level development of hop powdery mildew

D. H. GENT (1), S. Bhattacharyya (2), T. Ruiz (2), M. Twomey (3), S. Wolfenbarger (3). (1) USDA ARS, Corvallis, OR, USA; (2) Oregon State University, Department of Statistics, Corvallis, OR, USA; (3) Oregon State University, Department of Botany and Plant Pathology, Corvallis, OR, USA

479-P A low-cost spore trap allows collection of *Fusarium circinatum* airborne spores for real-time PCR quantification

T. QUESADA (1), J. Hughes (1), K. Smith (2), P. James (1), K. Shin (1), J. A. Smith (1). (1) University of Florida, Gainesville, FL, USA; (2) USDA Forest Service, Gainesville, FL, USA

480-P Biological relevance of the detection of pospiviroids on pepper and tomato seeds

H. KOENRAADT. Naktuinbouw, Roelofarendsveen, NETHERLANDS

481-P Is the begomovirus, *Sweet potato leaf curl virus*, really seed transmitted in sweetpotato?

K. S. LING, P. Wadl, L. Williams, A. Simmons, M. Jackson. USDA-ARS, Charleston, SC, USA

Pathogen-Vector Interactions

482-P Presence and prevalence of *Raffaelea lauricola*, cause of laurel wilt, in different species of ambrosia beetle in Florida

R. C. PLOETZ (1), J. Konkol (2), T. Navarez (2), R. Duncan (2), J. R. Saucedo Carabez (2), A. Campbell (3), J. Mantilla (2), D. Carrillo (1), P. Kendra (3). (1) University of Florida, Tropical Research and Education Center, Homestead, FL, USA; (2) University of Florida, Homestead, FL, USA; (3) USDA-ARS, Miami, FL, USA

483-P Species diversity of *Leptographium* and *Grossmannia* blue-stain fungi associated with root-feeding beetles in loblolly pine stands

M. BULAND (1), B. Barnes (1), K. Klepzig (2), K. Gandhi (1), C. Villari (1). (1) D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA, USA; (2) USDA Forest Service, Asheville, NC, USA

484-P Two novel fungal symbionts of invasive Kuroshio shot hole borer (*Euwallacea* sp. nr. *forficatus*) causing *Fusarium* dieback on woody hosts in California

J. D. CARRILLO (1), J. S. Mayorquin (2), F. Na (2), J. Stajich (2), A. Eskalen (1). (1) University of California-Riverside, Department of Plant Pathology

and Microbiology, Riverside, CA, USA; (2) University of California-Riverside, Riverside, CA, USA

485-P Genetic diversity and spatial structure of the walnut twig beetle, *Pityophthorus juglandis*, the vector of thousand cankers in U.S.A. and Europe

E. Oren (1), W. Klingeman (1), J. Moulton (1), P. Lambdin (1), M. Faccoli (2), D. HADZIABDIC (1). (1) University of Tennessee, Knoxville, TN, USA; (2) University of Padua, Legnaro, ITALY

486-P Occurrence of *Xanthomonas vasicola* on maize seeds in the United States

S. ARIAS (1), C. C. Block (1), D. A. Mayfield (1), T. A. Jackson-Ziems (2), K. D. Broders (3), G. P. Munkvold (1). (1) Iowa State University, Ames, IA, USA; (2) University of Nebraska-Lincoln, Lincoln, NE, USA; (3) Colorado State University, Fort Collins, CO, USA

487-P Preliminary assessment of insect-associated *Geosmithia* species in Tennessee

K. CHAHAL, R. O. Gazis, J. Grant, D. Hadziabdic, P. Lambdin, W. Klingeman, M. T. Windham. University of Tennessee, Knoxville, TN, USA

488-P Potential alternative vectors of *Geosmithia morbida* (thousand cankers disease) in east Tennessee

K. CHAHAL, R. O. Gazis, J. Grant, D. Hadziabdic, P. Lambdin, W. Klingeman, D. Paulsen, M. T. Windham. University of Tennessee, Knoxville, TN, USA

489-P Impact of late season vine-kill on incidence of ‘*Candidatus Liberibacter solanacearum*’ in potato tubers

F. WORKNEH (1), L. Paetzold (1), C. M. Rush (2). (1) Texas A&M University AgriLife Research, Bushland, TX, USA; (2) Texas A&M University AgriLife Research, Amarillo, TX, USA

Pathogenicity and Host Specificity

490-P Pathogenicity of *Verticillium dahliae* Klebahn in rootstock rose cv. Manetti.

R. GARCIA-VELASCO, G. Dominguez-Arizmendi, E. A. Chavarro-Carrero, M. E. Mora-Herrera. Universidad Autónoma del Estado de México, Tenancingo, MEXICO

491-P Investigations on the lily bulb- and root rot disease complex involving multiple pathogenic fungi and the root lesion nematode *Pratylenchus penetrans*

D. LAKSHMAN (1), K. Kamo (2), P. Vieira (3), R. Pandey (4). (1) USDA-ARS, Beltsville, MD, USA; (2) USDA-ARS, FNPRU, National Arboretum, Beltsville, MD, USA; (3) Virginia Polytechnic Institute and State University, Blacksburg, VA, USA; (4) Sustainable Agricultural System Lab, Beltsville, MD, USA

492-P Host preferences of *Colletotrichum* species isolated from mango and tree tomato in Colombia

L. Cabrera Villamizar (1), C. P. Rojas (1), C. J. Pardo De la Hoz (1), S. Rojas (1), M. Mideros (1), L. Lopez (2), P. Jimenez (3), S. RESTREPO (1). (1) Universidad de los Andes, Bogota, COLOMBIA; (2) Universidad Nacional, Bogota, COLOMBIA; (3) Universidad Militar Nueva Granada, Bogota, COLOMBIA

493-P Pathogenicity of *Stemphylium vesicarium* on asparagus and onion

J. Foster (1), C. S. Tayviah (1), B. D. Gossen (2), M. R. MCDONALD (1). (1) University of Guelph, Guelph, ON, CANADA; (2) Agriculture & Agri-Food Canada, Saskatoon, SK, CANADA

494-P Identification of *Colletotrichum* species causing anthracnose of pomegranate in Florida

K. V. XAVIER (1), A. Nepal (2), N. Peres (1), G. E. Vallad (1). (1) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA; (2) Oregon State University, Central Point, OR, USA

495-P Genome wide association mapping of resistance to tan spot in durum wheat

N. N. Galagedara (1), X. Li (1), S. Chao (2), S. Xu (2), J. D. Faris (2), Z. LIU (1). (1) North Dakota State University, Fargo, ND, USA; (2) USDA-ARS, Northern Crop Science Laboratory, Fargo, ND, USA

496-P Pathogenicity of *Rhizoctonia solani* and *Phytophthora nicotianae* to *Brassicaceae* biofumigant cover crops

P. Liyanapathirana, T. Simmons, F. BAYSAL-GUREL. Tennessee State University, McMinnville, TN, USA

497-P Host specificity and survival of *Colletotrichum* species on celery and common weeds

S. Reynolds (1), M. J. Celetti (2), K. S. Jordan (1), M. R. MCDONALD (1). (1) University of Guelph, Guelph, ON, CANADA; (2) OMAFRA, Guelph, ON, CANADA

498-P Cross pathogenicity of *Diaporthe gulyae* on sunflower and weed hosts

B. KONTZ (1), A. Adhikari (1), T. Olson (1), P. O. Johnson (1), S. G. Markell (2), F. M. Mathew (1). (1) South Dakota State University, Brookings, SD, USA; (2) North Dakota State University, Fargo, ND, USA

499-P Determination of rose black spot (*Diplocarpon rosae*) race diversity in Canada to facilitate targeted disease resistance breeding

A. M. POLEATEWICH (1), I. Perez-Valdes (2), P. Sandhu (2), T. Banks (2), D. Somers (2). (1) University of New Hampshire, Durham, NH, USA; (2) Vineland Research and Innovation Centre, Vineland Station, ON, CANADA

500-P Genetic structure, geography, and host specialization within populations of *Pseudoperonospora cubensis* in the United States

A. THOMAS, I. Carbone, P. Ojiambo. North Carolina State University, Raleigh, NC, USA

501-P Survey of fungi from symptomatic leaves of cornelian cherry dogwood (*Cornus mas*) in eastern Tennessee

T. COLLINS, M. M. Dee, D. D. Hensley, B. H. Ownley. University of Tennessee, Department of Entomology and Plant Pathology, Knoxville, TN, USA

502-P Thousand cankers disease severity is not determined by *Geosmithia morbida* genetic grouping nor a synergistic relationship with *Fusarium solani*

R. A. SITZ (1,2), E. K. Luna (1), J. R. Ibarra Caballero (1), N. A. Tisserat (1), W. S. Cranshaw (1), J. E. Stewart (1).

(1) Colorado State University, Fort Collins, CO, USA; (2) USDA Forest Service, Moscow, ID, USA

503-P Long-term monitoring of cucurbit powdery mildew (*Podospheera xanthii*) races in Charleston, South Carolina

C. KOUSIK (1), J. Ikerd (1), M. K. Mandal (2). (1) U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA; (2) ORISE participant, U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA

504-P Comparing inoculation methods to study the aggressiveness of *Diaporthe aspalathi* causing southern stem canker of soybean

K. GHIMIRE (1), B. Kontz (1), D. L. Smith (2), C. A. Bradley (3), D. S. Mueller (4), K. A. Wise (5), N. Braun (1), F. M. Mathew (1). (1) South Dakota State University, Brookings, SD, USA; (2) University of Wisconsin, Madison, WI, USA; (3) University of Kentucky, Princeton, KY, USA; (4) Iowa State University, Ames, IA, USA; (5) Purdue University, West Lafayette, IN, USA

505-P Characterization of *Fusarium* spp. isolates recovered from dry bean in Michigan

K. OUDMAN, J. L. Jacobs, M. Chilvers. Michigan State University, East Lansing, MI, USA

506-P Screening inoculation methods and recombinant inbred lines for partial resistance to *Phytophthora sojae* in soybean

R. D. S. CHOWDHURY. South Dakota State University, Brookings, SD, USA

507-P *Berberis holstii* is functional as an alternate host for *Puccinia graminis* f. sp. *tritici* in eastern Africa

Y. JIN (1), G. Wolderufael (2), M. Lim (3), P. D. Olivera Firpo (4), E. Hailu (2), R. O. Wanyera (5). (1) USDA-ARS, Cereal Disease Laboratory, St. Paul, MN, USA; (2) Ethiopian Institute of Agricultural Research, Ambo, ETHIOPIA; (3) USDA ARS, St. Paul, MN, USA; (4) University of Minnesota, St. Paul, MN, USA; (5) Kenya Agricultural & Livestock Research Organization, Njoro, KENYA

508-P Pathotypes of *Phytophthora sojae* from South Dakota soybean fields

R. D. S. CHOWDHURY. South Dakota State University, Brookings, SD, USA

509-P Temporal dynamics of *Fusarium virguliforme* colonization on soybean and corn roots: Field to lab

A. M. BAETSEN-YOUNG, J. L. Jacobs, A. Byrne, B. Day, M. Chilvers. Michigan State University, East Lansing, MI, USA

510-P Towards sustainable solutions for *Fusarium* wilt: Ecology of putative pathogenicity factors in populations of *Fusarium oxysporum* from banana

G. R. TESDALL, F. A. Magdama, M. D. M. Jimenez-Gasco. The Pennsylvania State University, University Park, PA, USA

Phytobiomes

511-P The impact of pesticides on the turfgrass rhizosphere microbiome

E. BUCZKOWSKI, M. Millican, P. L. Koch. University of Wisconsin-Madison, Madison, WI, USA

512-P Mycobiome study reveals pathogens of *Camassia* in the Pacific Northwest

G. M. FREED (1), T. C. Paulitz (2), F. M. Dugan (3). (1) Washington State University, Pullman, WA, USA; (2) USDA ARS, Pullman, WA, USA; (3) USDA ARS WRPIS, Pullman, WA, USA

513-P Successional dynamics of fungal and oomycete communities in herbicide-killed wheat roots

D. C. SCHLATTER, T. C. Paulitz. USDA ARS, Pullman, WA, USA

514-P Potato crop yields and soil microbiome composition in response to nitrogen amendments in fumigated and nonfumigated soils

J. P. DUNDORE-ARIAS, L. K. Otto-Hanson, C. Rosen, L. L. Kinkel. University of Minnesota, St. Paul, MN, USA

515-P Minimal impacts of repeated glyphosate use on wheat-associated bacterial microbiomes

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516-P The effects of penicillin injection on the bacterial phytobiome of citrus roots and petioles are dose and time dependent

M. Asuncion (1), K. Shin (2), J. C. Huguet-Tapia (2), A. H. van Bruggen (2), E. M. GOSS (1). (1) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (2) University of Florida, Gainesville, FL, USA

517-P The effects of cover crops on the soil microbiome: A metagenomics study

J. HACKMAN (1), A. Y. Srouf (1), R. Cook (2), J. P. Bond (1), A. M. Fakhoury (1). (1) Southern Illinois University, Carbondale, IL, USA; (2) North Carolina State University, Raleigh, NC, USA

518-P Metacoder: An R package for visualization and manipulation of community taxonomic diversity data

Z. FOSTER (1,2), T. Sharpton (2), N. Grunwald (1). (1) USDA ARS, Corvallis, OR, USA; (2) Oregon State University, Corvallis, OR, USA

519-P A Vavilovian approach to the phytobiome: Impact of domestication on the common bean microbiome

G. IRIARTE, K. D. Broders. Colorado State University, Fort Collins, CO, USA

Plant Defense Responses

- 520-P Potential pleiotropic effects of 43 leaf rust resistance genes in ozone tolerance of spring wheat variety 'Thatcher'**
A. M. MASHAHEET (1,2), D. S. Marshall (3), R. Ullah (4), A. Abdelrhim (2,5), K. Burkey (3). (1) Damanhour University, Damanhour, EGYPT; (2) North Carolina State University, Raleigh, NC, USA; (3) USDA-ARS, Raleigh, NC, USA; (4) The University of Agriculture, Khyber Pakhtunkhwa, PAKISTAN; (5) Minia University, Minia, EGYPT
- 521-P Molecular mechanisms of resistance in alfalfa to bacterial stem blight caused by *Pseudomonas syringae* pv. *syringae***
L. G. NEMCHINOV (1), J. Shao (2), O. Postnikova (3), D. A. Samac (4). (1) USDA ARS MPPL, Beltsville, MD, USA; (2) USDA, Beltsville, MD, USA; (3) USDA ARS, Beltsville, MD, USA; (4) USDA ARS, St. Paul, MN, USA
- 522-P Phenotypic characterization and transcriptomic analysis of apple root defense responses to apple replant soilborne pathogen *Pythium ultimum***
Y. ZHU (1), M. Mazzola (1), G. Fazio (2), J. Shao (3), R. E. Davis (4), J. Zhao (5), Z. Zhou (6). (1) USDA ARS, Wenatchee, WA, USA; (2) Cornell University, Geneva, NY, USA; (3) USDA, Beltsville, MD, USA; (4) USDA ARS, Molecular Plant Pathology Lab, Beltsville, MD, USA; (5) Hebei Academy of Forestry Science, Shijiazhuang, CHINA; (6) Institute of Pomology, Chinese Academy of Agricultural Sciences, Beijing, CHINA
- 523-P Comparing root knot nematode (*Meloidogyne* spp.) effects on tomato (*Solanum lycopersicum*) and grapevine (*Vitis* spp.) metabolic profiles**
C. M. WALLIS. USDA ARS, Parlier, CA, USA
- 524-P Below-ground attack by the root knot nematode *Meloidogyne graminicola* predisposes rice to blast disease**
T. Kyndt, H. YIMER, A. Haeck, R. Singh, D. De Vleeschauwer, S. Denil, T. De Meyer, M. M. Hofte, K. Demeestere, G. Gheysen. Ghent University, Gent, BELGIUM
- 525-P Functional study of rice 14-3-3 proteins GF14c and GF14f in resistance to *Magnaporthe oryzae***
P. SUTTIVIRIYA (1), C. H. Park (1), M. D. Bellizzi (1), G. L. Wang (1,2). (1) The Ohio State University, Columbus, OH, USA; (2) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, CHINA
- 526-P Characterization of the structural basis of winter squash fruit age-related resistance to *Phytophthora capsici***
S. A. ALZOHAIY (1), R. Hammerschmidt (2), M. K. Hausbeck (2). (1) Department of Plant Soil and Microbial Sciences, Michigan State University, East Lansing, MI, USA; (2) Michigan State University, East Lansing, MI, USA
- 527-P A functional developmental genomics screen is identifying genes functioning within cells that function in plant to a root pathogen**
B. R. LAWAJU. Mississippi State University, Starkville, MS, USA

- 528-P NPR1 interacts with TCP15 to regulate the transcription of *PR5* in plant defense**
M. LI, Z. Fu, H. Chen, J. Chen. University of South Carolina, Columbia, SC, USA
- 529-P Group I and II *Acidovorax citrulli* strains elicit different gene expression profiles in susceptible melon seedlings**
Y. Zhang (1,2), M. Zhao (3), Y. Yang (1), W. Guan (1), W. Ji (2), Q. R. Bai (2), J. Gao (2), R. R. Walcott (3), T. ZHAO (1,2). (1) Institute of Plant Protection, CAAS, Beijing, CHINA; (2) Jilin Agricultural University, Changchun, CHINA; (3) The University of Georgia, Athens, GA, USA
- 530-P Disruption of the genome of rice blast to identify genes involved in production of reactive oxygen species**
J. COOPER, N. M. Donofrio. University of Delaware, Newark, DE, USA
- 531-P Understanding the mechanism of resistance breaking on tomato by *Tomato mottle mosaic virus***
X. Sui (1,2), M. SHAMIMUZZAMAN (1), Y. Zheng (3), A. Simmons (1), Z. Fei (3), Z. Wu (2), K. S. Ling (1). (1) USDA-ARS, Charleston, SC, USA; (2) Fujian Agriculture and Forestry University, Fuzhou, CHINA; (3) Boyce Thompson Institute, Ithaca, NY, USA
- 532-P Inactivation of SnRK1 by geminiviruses AC2/C2 proteins plays an important role in the regulation of plant innate immune responses**
M. LOCKWOOD, G. Sunter. University of Texas-San Antonio, San Antonio, TX, USA

Population Biology Genetics

- 533-P Psyllid haplotypes in southern Idaho potato fields, 2012 to 2015, and incidence of '*Candidatus Liberibacter solanacearum*' causing zebra chip disease**
J. DAHAN (1), E. J. Wenninger (2), B. Thompson (1), S. Eid (1), N. L. Olsen (2), A. V. Karasev (1). (1) University of Idaho, Moscow, ID, USA; (2) University of Idaho, Kimberly, ID, USA
- 534-P Metabarcoding pathogenic *Fusarium* spp. in soybean seeds**
R. PEDROZO (1), A. Jumpponen (2), C. R. Little (1). (1) Kansas State University, Manhattan, KS, USA; (2) Biology Department, Kansas State University, Manhattan, KS, USA
- 535-P Understanding *Fusarium* species causing *Fusarium* root rot in corn, soybean, and wheat in Nebraska**
L. P. PARIKH, S. Kodati, M. Eskelson, A. O. Adesemoye. University of Nebraska-Lincoln, North Platte, NE, USA
- 536-P Genetic analysis of *Pyrenopeziza brassicae*, cause of light leaf spot of brassicas, in the European Union, Oceania, and North America**
S. CARMODY (1), K. King (2), B. Claassen (3), B. B. Fraaije (2), J. West (2), C. M. O'camb (3), L. du Toit (1). (1) Washington State University, Mount Vernon, WA, USA; (2) Rothamsted Research, Hertfordshire, ENGLAND; (3) Oregon State University, Corvallis, OR, USA

- 537-P Morphological and molecular characterization of *Mycosphaerella nawae* isolates from persimmon leaf**
O. Hassan (1), J. Y. Jeon (1), J. S. Shin (1), N. K. Oh (1), T. CHANG (2). (1) Kyungpook National University, Sangju, REPUBLIC OF (SOUTH) KOREA; (2) Kyungpook National University, Sangju, Gyungbuk, KOREA
- 538-P *In vitro* evidence for sexual reproduction in *Venturia effusa*, causal agent of pecan scab**
N. D. CHARLTON (1), C. Mattupalli (1), C. H. Bock (2), C. A. Young (1). (1) The Samuel Roberts Noble Foundation, Ardmore, OK, USA; (2) USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA
- 539-P Genotypic characterization of isolates of *Golovinomyces magnicellulatus*, the biotrophic powdery mildew pathogen of *Phlox***
C. FARINAS (1), F. Peduto Hand (2). (1) The Ohio State University, Columbus, OH, USA; (2) Ohio State University, Department of Plant Pathology, Columbus, OH, USA
- 540-P A 2-year analysis of rust fungi intercepted at Arizona ports of entry**
D. C. SANDBERG. USDA-APHIS-PPQ, Nogales, AZ, USA
- 541-P Molecular phylogeny of *Septoria* isolates from tomato in Brazil**
C. A. da Costa (1), V. LOURENÇO JR. (2), L. S. Boiteux (3), M. E. D. N. Fonseca (2), A. Reis (2). (1) Universidade Federal Rural de Pernambuco, Recife, BRAZIL; (2) Embrapa, Brasília, BRAZIL
- 542-P A phylogenomic marker-based comparative studies of *Pseudomonas syringae* and its related species**
M. RANJAN, P. B. Patil. CSIR-IMTECH, Chandigarh, INDIA
- 543-P Stripe rust epidemics of wheat and barley and races of *Puccinia striiformis* identified in the United States in 2016**
A. Wan (1), M. Wang (1), X. CHEN (2). (1) Washington State University, Pullman, WA, USA; (2) USDA ARS, Pullman, WA, USA
- 544-P Diversity of *Fusarium oxysporum* f. sp. *niveum* from watermelon in Georgia**
A. PETKAR, P. Ji. University of Georgia, Tifton, GA, USA
- 545-P Genetic variability among natural populations of *Sugarcane mosaic virus* (SCMV) in the northern Guinea savannah agroecological region of Nigeria**
A. YAHAYA (1), D. B. Dangora (1), L. Gregg (2), M. D. Alegbejo (1), P. L. Kumar (3), O. J. Alabi (4). (1) Ahmadu Bello University, Zaria, NIGERIA; (2) Department of Plant Pathology and Microbiology, Texas A&M University AgriLife Research and Extension Center, Weslaco, TX, USA; (3) International Institute of Tropical Agriculture, Ibadan, NIGERIA; (4) Department of Plant Pathology & Microbiology, Texas A&M University, Weslaco, TX, USA
- 546-P Prevalence and pathogenicity of *Rhizoctonia* spp. from soybean in Nebraska**
S. KODATI (1), N. Gambhir (2), S. E. Everhart (2), A. O. Adesemoye (1). (1) University of Nebraska-Lincoln, North Platte, NE, USA; (2) University of Nebraska, Lincoln, NE, USA
- 547-P Genetic and morphological characterisation of *Verticillium dahliae* collected from cotton crops throughout NSW, Australia**
K. KIRKBY (1), T. Chapman (2), S. Roser (1), P. A. Loneragan (1), P. Dadd-Daigle (2), S. Harden (3). (1) Biosecurity and Food Safety, NSW Department of Primary Industries, Narrabri, AUSTRALIA; (2) Biosecurity and Food Safety, NSW Department of Primary Industries, Narellan, AUSTRALIA; (3) NSW Department of Primary Industries, Tamworth, AUSTRALIA
- 548-P Genome-wide informative microsatellite database and global population structure of *Fusarium virguliforme***
G. CAI (1), T. J. Fleury (2), K. A. Wise (3), T. J. Hughes (4). (1) USDA-ARS, Purdue University, West Lafayette, IN, USA; (2) USDA-ARS, West Lafayette, IN, USA; (3) Purdue University, West Lafayette, IN, USA; (4) Monsanto Co., Chesterfield, MO, USA
- 549-P Genomic fingerprinting and phylogenetic analyses of *Xanthomonas perforans* strains provide insights into bacterial evolution and global movement**
S. TIMILSINA (1), P. Abrahamian (2), F. Iruegas-Bocardo (1), G. V. Minsavage Jr. (1), B. Kolaczowski (3), F. F. White (4), B. Staskawicz (5), G. E. Vallad (2), E. M. Goss (1), J. B. Jones (1). (1) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (2) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA; (3) Department of Microbiology and Cell Science, University of Florida, Gainesville, FL, USA; (4) University of Florida, Gainesville, FL, USA; (5) University of California, Berkeley, CA, USA
- 550-P Characterization of microsatellites from a genome of *Venturia carpophila***
C. Chen (1), P. M. Brannen (2), J. E. Adaskaveg (3), C. H. BOCK (1). (1) USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA; (2) University of Georgia, Athens, GA, USA; (3) Department of Plant Pathology and Microbiology, University of California, Riverside, CA, USA
- 551-P Distribution and abundance of *Macrophomina phaseolina* in Paraguay**
H. D. LOPEZ-NICORA (1), C. Grabowski Ocampos (2), A. L. Orrego Fuente (2), L. M. Pedrozo (3), E. Hahn Villalba (4), T. I. Ralston (1), T. L. Niblack (1). (1) The Ohio State University, Columbus, OH, USA; (2) Facultad de Ciencias Agrarias, Universidad Nacional de Asunción, San Lorenzo, PARAGUAY; (3) Instituto Paraguayo de Tecnología Agropecuaria (IPTA), Caacupé, PARAGUAY; (4) Facultad de Ciencias Agropecuarias, Universidad Católica, Hohenau, PARAGUAY
- 552-P Genetic diversity, aggressiveness, and fungicide sensitivity of *Pythium irregulare* isolated from soybean in Ohio**
J. HUZAR NOVAKOWISKI, A. E. Dorrance. The Ohio State University, Wooster, OH, USA

- 553-P Influence of sampling on detection of simple sequence repeat haplotypes of *Aspergillus flavus* associated corn**
D. EDMUNDS (1), H. L. Mehl (2), P. J. Cotty (3). (1) University of Arizona, Tucson, AZ, USA; (2) Virginia Tech Tidewater AREC, Suffolk, VA, USA; (3) USDA-ARS, University of Arizona, Tucson, AZ, USA
- 554-P I think we're a clone now: Factors influencing inference of clonality in diploid populations**
Z. N. KAMVAR (1), S. E. Everhart (1), N. Grunwald (2). (1) University of Nebraska, Lincoln, NE, USA; (2) USDA ARS, Corvallis, OR, USA
- 555-P AmpSeq: Use of a new genotyping tool to address practical questions in pathogen biology, population studies, and fungicide resistance**
B. KISSELSTEIN (1), L. E. Cadle-Davidson (2), W. Weldon (1), B. B. Forcelini (3), N. Peres (4), M. T. McGrath (5), B. A. Tadesse (6), A. Stensvand (6), D. M. Gadoury (1). (1) Cornell University, Geneva, NY, USA; (2) USDA Grape Genetics Research Unit, Geneva, NY, USA; (3) University of Florida, Wimauma, FL, USA; (4) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA; (5) Cornell University, Riverhead, NY, USA (6) Norwegian Institute of Bioeconomy Research (NIBIO), Ås, NORWAY
- 556-P Cluster analysis of *Anisogramma anomala* isolates collected from the Pacific Northwest and New Jersey**
J. TOBIA (1), M. Muehlbauer (1), J. Honig (1), J. Pscheidt (2), T. J. Molnar (1). (1) Rutgers University, New Brunswick, NJ, USA; (2) Oregon State University, Corvallis, OR, USA
- 557-P Population genetic analysis for a worldwide collection of *Phytophthora palmivora***
Y. GUO, G. A. Torres-Londono, M. K. Hausbeck. Michigan State University, East Lansing, MI, USA
- 558-P Population biology and comparative genomics of *Claviceps purpurea* and other defensive mutualists in the Hypocreales**
S. WYKA, G. Wu, K. D. Broders. Colorado State University, Fort Collins, CO, USA
- 559-P Genetic diversity and population characterization of *Erysiphe pulchra*, the causal agent of dogwood powdery mildew, from the eastern United States**
C. R. WYMAN (1), S. L. Boggess (1), D. Hadziabdic (1), T. A. Rinehart (2), A. S. Windham (3), P. A. Wadl (4), R. N. Trigiano (1). (1) University of Tennessee, Knoxville, TN, USA; (2) USDA, Poplarville, MS, USA; (3) Soil, Plant, and Pest Center, Nashville, TN, USA; (4) U.S. Vegetable Lab, Charleston, SC, USA
- 560-P Identification of promising bacterial root symbionts from switchgrass (*Panicum virgatum*) growing in the prairies of Oklahoma**
M. H. CHI, K. D. Craven. The Samuel Roberts Noble Foundation, Ardmore, OK, USA
- 561-P Metagenomic sequencing reveals bacterial community composition of native and cultivated cranberry bogs**
G. EBADZADSAHRAI, A. Harrison, S. Soby, S. Gadagkar. Midwestern University, Glendale, AZ, USA
- 562-P Diversity and fungicide sensitivity of the cacao pathogens *Moniliophthora perniciosa* and *M. roreri***
M. G. Mariduenza-Zavala (1), A. Freire-Penaherrera (1), M. Villavicencio-Vasquez (2), R. Espinoza-Lozano (2), J. CEVALLOS-CEVALLOS (1). (1) Escuela Superior Politecnica del Litoral, ESPOL, Guayaquil, ECUADOR; (2) ESPOL, Guayaquil, ECUADOR
- 563-P Population biology of the downy mildew pathogen on tolerant and susceptible cucumber in southeastern United States**
M. K. MANDAL (1), J. Ikerd (2), E. Wallace (3), R. Grace (4), W. W. Turechek (5), L. Quesada-Ocampo (6), C. Kousik (2). (1) ORISE participant, U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA; (2) U.S. Vegetable Laboratory, USDA ARS, Charleston, SC, USA; (3) North Carolina State University, Raleigh, NC, USA; (4) U.S. Horticultural Research Laboratory, USDA ARS, Fort Pierce, FL, USA; (5) USDA ARS SAA SPP, Fort Pierce, FL, USA; (6) Department of Plant Pathology, North Carolina State University, Raleigh, NC, USA
- 564-P Leaf spot fungi of no-till wheat in Oklahoma and evaluation of SSR loci for population biology of the tan spot fungus, *Pyrenophora tritici-repentis***
S. SUAREZ, S. M. Marek, R. M. Hunger, C. D. Garzon. Oklahoma State University, Stillwater, OK, USA
- 565-P Temperature adaptation in *Macrophomina phaseolina*, the causal agent of charcoal rot on soybean**
V. ORTIZ LONDONO (1), K. A. Wise (2), M. Chilvers (1). (1) Michigan State University, East Lansing, MI, USA; (2) Purdue University, West Lafayette, IN, USA
- 566-P CRISPR/Cas sequence-based confirmation of an emergent population of *Rathayibacter toxicus* in South Australia**
J. P. STACK (1), G. Y. Busot (1), M. Arif (2). (1) Kansas State University, Manhattan, KS, USA; (2) University of Hawaii, Oahu, HI, USA
- 567-P Characterization of *Phytophthora infestans* isolates from Indonesia**
S. DANGI (1), D. Douches (2), P. S. Wharton (1). (1) University of Idaho, Aberdeen Research and Extension Center, Aberdeen, ID, USA; (2) Michigan State University, Department of Plant, Soil, and Microbial Sciences, East Lansing, MI, USA
- 568-P Phylogenetic analysis of *Diaporthe* spp. in highbush blueberries in Michigan**
G. KOTAMRAJU, K. Clemens, A. C. Schilder. Michigan State University, East Lansing, MI, USA
- 569-P Trade-offs and synergies in microbial mediated functions for potato plant health**
R. LANKAU. University of Wisconsin, Madison, WI, USA

Postharvest Pathology and Mycotoxins

- 570-P The use of plant extracts for the management of post-harvest diseases of tomato in Kenya**
G. M. KARIUKI. Kenyatta University, Nairobi, KENYA
- 571-P *Aspergillus section flavi* community structure impacts aflatoxin contamination in Zambia**
P. W. KACHAPULULA (1,2), J. Akello (3), R. Bandyopadhyay (4), P. J. Cotty (1,5). (1) University of Arizona, Tucson, AZ, USA; (2) University of Zambia, Lusaka, ZAMBIA; (3) International Institute of Tropical Agriculture (IITA-Zambia), Lusaka, ZAMBIA; (4) International Institute of Tropical Agriculture, Ibadan, NIGERIA; (5) USDA-ARS, University of Arizona, Tucson, AZ, USA
- 572-P Control of Rhizopus rot of tomato fruit by postharvest fungicide application**
J. BARTZ (1), D. Spiceland (1), S. Sargent (1), A. Berry (1), M. T. Elkahky (2), G. E. Vallad (3). (1) University of Florida, Gainesville, FL, USA; (2) Mansoura University, Mansoura, EGYPT; (3) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA
- 573-P Options to reduce costs of aflatoxin control in commercial cotton with area-wide programs utilizing atoxigenic biocontrol agents**
R. JAIME (1), L. Antilla (2), L. Liesner (2), P. J. Cotty (3). (1) University of Arizona, Tucson, AZ, USA; (2) Arizona Cotton Research and Protection Council, Phoenix, AZ, USA; (3) USDA-ARS, University of Arizona, Tucson, AZ, USA
- 574-P Molecular bases for loss of pectinase P2c activity in morphologically and geographically distinct populations of *Aspergillus flavus***
S. SMITH (1), P. J. Cotty (2). (1) The University of Arizona, Tucson, AZ, USA; (2) USDA-ARS, University of Arizona, Tucson, AZ, USA
- 575-P Characterization of atoxigenic *Aspergillus parasiticus* from peanuts in Malawi**
C. CHING'ANDA (1), J. Atehnkeng (2), R. Bandyopadhyay (3), P. J. Cotty (4). (1) University of Arizona, Tucson, AZ, USA; (2) International Institute of Tropical Agriculture, Lilongwe, MALAWI; (3) International Institute of Tropical Agriculture, Ibadan, NIGERIA; (4) USDA-ARS, University of Arizona, Tucson, AZ, USA
- 576-P Evaluation of Academy™ postharvest fungicide to control blue mold of stored apple fruit caused by *Penicillium expansum***
W. M. Jurick II (1), V. L. Gaskins (1), M. W. Choi (2), K. D. COX (2,3). (1) USDA-ARS Food Quality Laboratory, Beltsville, MD, USA; (2) Cornell University, Geneva, NY, USA; (3) Cornell University, Plant Pathology & Plant-Microbe Biology Section, Geneva, NY, USA
- 577-P Effect of humidity, temperature, and inoculum level on disease progression of sweetpotato black rot caused by *Ceratocystis fimbriata***
M. STAHR, L. M. Quesada. North Carolina State University, Raleigh, NC, USA
- 578-P Control of sour rot (*Geotrichum candidum*) on tomato in a commercial packing house using a post-harvest fungicide drip application**
C. COLLAZO-GONZALEZ (1), C. Weaver (2). (1) Syngenta Crop Protection, Vero Beach, FL, USA; (2) Syngenta Crop Protection, Visalia, CA, USA
- 579-P Prevalence and incidence of postharvest diseases of mandarin fruit in California**
S. SAITO, C. L. Xiao. USDA ARS, Parlier, CA, USA
- 580-P Unassembled transcriptome analysis to infer aflatoxin production in *Aspergillus flavus* strains infecting corn using EDNA**
A. ESPINDOLA (1), W. Schneider (2), H. A. Melouk (3), S. M. Marek (1), K. F. Cardwell (1), C. D. Garzon (1). (1) Oklahoma State University, Stillwater, OK, USA; (2) USDA ARS FDWSRU, Fort Detrick, MD, USA; (3) USDA ARS, Stillwater, OK, USA
- 581-P Fusarium ear rot and mycotoxin production by *Fusarium subglutinans* and *F. temperatum* on Bt and non-Bt maize infested with lepidopteran insect pests**
D. A. MAYFIELD (1), F. E. Lanza (2), M. Sulyok (3), R. Krska (3), G. P. Munkvold (1). (1) Iowa State University, Ames, IA, USA; (2) CAPES Foundation, Ministry of Education of Brazil, Brasília, BRAZIL; (3) Department of Agrobiotechnology, University of Natural Resources and Life Sciences, Vienna, AUSTRIA
- 582-P Mexican maize landraces and their association with potentially toxigenic *Fusarium* spp.**
L. M. VÁSQUEZ-SILLER, J. L. Herrera-Ayala, M. C. Vega-Sánchez, A. Muñoz-Urbina, S. Rodríguez-Herrera. Universidad Autónoma Agraria Antonio Narro, Saltillo, Coahuila, MEXICO
- 583-P *Botrytis cinerea* and *B. prunorum* associated with calyx-end rot in apples and pears in postharvest in the Maule Region, Chile**
E. E. FERRADA, M. A. Lolas, G. A. Diaz. Universidad de Talca, Talca, CHILE
- 584-P Identification of zearalenone degradation by *Clonostachys rosea* isolates, cloning and expression of *zhd101* gene**
I. J. KANG, H. K. Shim, J. H. Roh, Y. Kim, S. Heu. National Institute of Crop Science, RDA, Suwon, REPUBLIC OF (SOUTH) KOREA
- 585-P *Aspergillus flavus*, population biology of corn infectors**
J. A. REYES-PINEDA (1), K. E. Damann (2). (1) Louisiana State University, Baton Rouge, LA, USA; (2) Louisiana State University AgCenter, Baton Rouge, LA, USA
- 586-P Interactions among active ingredients of a multi-isolate aflatoxin biocontrol product**
K. C. SHENGE (1), H. L. Mehl (2), P. J. Cotty (3). (1) USDA ARS, Tucson, AZ, USA; (2) Virginia Tech Tidewater AREC, Suffolk, VA, USA; (3) USDA-ARS, University of Arizona, Tucson, AZ, USA

587-P Influence of Bt maize (*Zea mays* (L.)) trait packages on aflatoxin contamination in south Texas maize production
G. L. SCHUSTER (1), D. Mays (2), M. Setamou (3), S. Nelson (1). (1) Texas A&M University-Kingsville, Kingsville, TX, USA; (2) Texas A&M University AgriLife Extension Service, Brownfield, TX, USA; (3) Texas A&M University Kingsville, Citrus Center, Weslaco, TX, USA

588-P Interaction between Bt and non-Bt corn hybrids and Afla-Guard to reduce aflatoxin contamination
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589-P Ecological diversity of *Aspergilli* community and aflatoxin prevalence in Mozambique
J. AUGUSTO (1), J. Atehnkeng (2), J. Akello (3), P. J. Cotty (4), R. Bandyopadhyay (5). (1) International Institute of Tropical Agriculture, Nampula, MOZAMBIQUE; (2) International Institute of Tropical Agriculture, Lilongwe, MALAWI; (3) International Institute of Tropical Agriculture (IITA-Zambia), Lusaka, ZAMBIA; (4) USDA-ARS, University of Arizona, Tucson, AZ, USA; (5) International Institute of Tropical Agriculture, Ibadan, NIGERIA

590-P Effect of concentration of *Pythium ultimum* inoculum in soil, and on tubers at harvest, and storage temperature on disease incidence and severity
S. DANGI (1), A. Malek (2), J. Woodhall (3), K. Fairchild (2), P. S. Wharton (1). (1) University of Idaho, Aberdeen Research and Extension Center, Aberdeen, ID, USA; (2) University of Idaho, Aberdeen, ID, USA; (3) University of Idaho, Parma, ID, USA

Proteomics/Metabolomics/Genomics

591-P A comparative genomic analysis of cell wall-degrading enzymes encoded proteins in *Magnaporthe oryzae*, *Neurospora crassa*, and *Aspergillus* sp.
Q. NGUYEN (1,2), T. Ho (3), C. Nguyen (4). (1) Research Institute for Biotechnology and Environment, Ho Chi Minh, VIETNAM; (2) Nong Lam University, Ho Chi Minh, VIETNAM; (3) International University, Ho Chi Minh, VIETNAM; (4) Ho Chi Minh City Open University, Ho Chi Minh, VIETNAM

592-P NGS of *Monilinia* causing brown rot of fruit and comparative genomics for diagnostics development
K. A. ZELLER, Y. Rivera, J. Sutherland, M. Galvez, Z. G. Abad. USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, USA

593-P Transcriptomic profiling of soybean leaves reveals the programming language of glyceollin biosynthesis against *Phakopsora pachyrhizi*
M. Z. HOSSAIN. University of Tsukuba, Tsukuba, JAPAN

594-P Whole transcriptome analysis of *Xylella fastidiosa* grown inside microfluidic chambers identified specific calcium-regulated genes
H. CHEN, L. De La Fuente. Auburn University, Auburn, AL, USA

595-P *Pseudomonas syringae* exhibits a genome-wide, bacteriophytochrome-mediated response to light and a stronger response to far-red than blue/red light
B. JANSSEN, H. Dong, G. A. Beattie. Iowa State University, Ames, IA, USA

596-P Genomic comparisons of *Armillaria solidipes* and *A. altimontana*—Species with different ecological behaviors
J. R. IBARRA CABALLERO (1), M. S. Kim (2), J. Hanna (3), N. B. Klopfenstein (3), J. Stewart (1). (1) Colorado State University, Fort Collins, CO, USA; (2) Kookmin University, Seoul, REPUBLIC OF (SOUTH) KOREA; (3) Rocky Mountain Research Station, USDA Forest Service, Moscow, ID, USA

597-P Comparative whole genome analysis of the wheat eyespot pathogens, *Oculimacula yallundae* and *O. acuformis*
H. SHENG, T. D. Murray. Washington State University, Pullman, WA, USA

598-P Comparative genomics of *Xanthomonas vasicola* pv. *vasculorum* isolates recovered from maize
G. WU, M. C. Ortiz, J. M. Lang, J. E. Leach, K. D. Broders. Colorado State University, Fort Collins, CO, USA

599-P Genome assembly and comparison of *Macrophomina phaseolina* isolates on strawberry and alfalfa
A. BURKHARDT (1), K. L. Childs (2), M. Ramon (1), F. N. Martin (1). (1) USDA ARS, Salinas, CA, USA; (2) Michigan State University, East Lansing, MI, USA

600-P Functional genomics and detection of virulence factors in *Clavibacter michiganensis* subsp. *nebraskensis*
J. C. HUGUET-TAPIA (1), B. Z. Fu (2), A. E. Robertson (3), S. Liu (4), F. F. White (1). (1) University of Florida, Gainesville, FL, USA; (2) Hubei Engineering University, Xiaogan Hubei, CHINA; (3) Iowa State University, Department of Plant Pathology, Ames, IA, USA; (4) Kansas State University, Manhattan, KS, USA

601-P High-quality genome of the peach scab pathogen, *Venturia carpophila*
C. Chen, C. H. BOCK, B. W. Wood. USDA ARS, Southeastern Fruit and Tree Nut Research Laboratory, Byron, GA, USA

602-P Genome-wide characterization of alternative splicing patterns in sugarcane modulated during infection with smut pathogen, *Sporisorium scitamineum*
R. BEDRE (1), S. Irigoyen (1), P. Schaker (2), C. Monteiro-Vitorello (2), K. K. Mandadi (1). (1) Texas A&M University AgriLife Research & Extension Center, Weslaco, TX, USA; (2) University of São Paulo, Piracicaba, BRAZIL

603-P Open pangenomes and recombination-generated diversity in *Xanthomonas euvesicatoria* and *X. perforans*
M. JIBRIN (1), P. D. Roberts (2), S. Timilsina (3), G. V. Minsavage Jr. (3), N. Potnis (4), G. E. Vallad (5), E. M. Goss (3), J. B. Jones (3). (1) University of Florida, Gainesville, FL, USA; (2) University of Florida, Immokalee, FL, USA; (3) Department of Plant Pathology, University of Florida, Gainesville, FL, USA; (4) Department of Entomology and Plant Pathology, Auburn University, Auburn, AL, USA; (5) Gulf Coast Research and Education Center, University of Florida, Wimauma, FL, USA

604-P Morphological, metabolic and transcriptional characterization of sexual fertilization in *Aspergillus flavus*
J. M. S. LUIS (1), I. Carbone (1), G. A. Payne (1), D. Bhatnagar (2), J. Cary (2), M. Lebar (2), G. Moore (2), P. Ojiambo (1). (1) North Carolina State University, Raleigh, NC, USA; (2) USDA ARS, SRRC, New Orleans, LA, USA

605-P Comparative genomic analysis of *Clavibacter michiganensis* subsp. *nebraskensis* isolates representing naturally occurring virulence diversity
R. R. MCNALLY, D. K. Malvick, C. A. Ishimaru. University of Minnesota, St. Paul, MN, USA

606-P Gene expression profile of *Acidovorax citrulli* during the early stages of watermelon seed germination
G. CHEN, R. R. Walcott. The University of Georgia, Athens, GA, USA

607-P Survey of toxin-antitoxin system distribution and diversity among genomes of plant-associated bacteria
L. R. TRIPLETT. Connecticut Agricultural Experiment Station, New Haven, CT, USA

608-P Using next-generation sequencing tools to incorporate herbarium specimens in systematic research
E. C. WALLACE (1,2), J. A. Crouch (2). (1) ARS-ORISE Research Participation Program, Beltsville, MD, USA; (2) USDA ARS, Beltsville, MD, USA

609-P Metagenomic analysis of virus and virus-like pathogens infecting pistachio in California
M. AL RWAHNIH (1), D. A. Golino (2), N. Westrick (1), K. Stevens (3,4), F. P. Trouillas (2), J. Preece (5), C. Kallsen (6), K. Farrar (4), A. Rowhani (2). (1) Department of Plant Pathology, University of California-Davis, Davis, CA, USA; (2) University of California, Davis, CA, USA; (3) Department of Evolution and Ecology, University of California-Davis, Davis, CA, USA; (4) Foundation Plant Services, University of California-Davis, Davis, CA, USA; (5) USDA-ARS National Clonal Germplasm Repository, Davis, CA, USA; (6) Cooperative Extension Kern County, Bakersfield, CA, USA

610-P *Pantoea ananatis* comparative genetics and *in planta* kinetics
S. STICE (1), B. Kvitko (1), B. Dutta (2). (1) University of Georgia, Athens, GA, USA; (2) University of Georgia, Tifton, GA, USA

611-P Genetic characterization of cucurbit yellow vine disease strains of *Serratia marcescens* using whole-genome sequencing
Z. MATTEEN, E. L. Little. University of Georgia, Department of Plant Pathology, Athens, GA, USA

612-P Deciphering protein-protein interaction network in the rice blast fungus, *Magnaporthe oryzae*
H. Kim, Y. H. LEE. Seoul National University, Seoul, REPUBLIC OF (SOUTH) KOREA

613-P Pan-genome analyses of black rot pathogen of crucifers, *Xanthomonas campestris* pv. *campestris*
A. Larrea (1), A. M. Alvarez (1), J. P. Stack (2), M. ARIF (1). (1) University of Hawaii at Manoa, Honolulu, HI, USA; (2) Kansas State University, Manhattan, KS, USA

614-P Tissue-specific transcriptional responses related to the horizontal and vertical transmission of a bacterial pathogen by its insect vector
I. E. BADILLO-VARGAS, R. Bedre, G. Esparza-Diaz, C. Avila, K. Mandadi. Texas A&M University AgriLife Research, Weslaco, TX, USA

615-P Effects of sublethal fungicide stress on genomes of *Sclerotinia sclerotiorum*
N. GAMBHIR, Z. N. Kamvar, S. E. Everhart. University of Nebraska, Lincoln, NE, USA

Virology

616-P *Pseudomonas oleovorans* strain KBPF-004 culture supernatants reduced seed transmission of CGMMV and PMMoV, and remodeled aggregation of 126-kDa protein
H. S. LIM (1), N. G. Kim (2), C. N. Park (2), H. S. Park (2), I. H. Kim (1), J. K. Kim (1), E. Y. Seo (1), L. Domier (3), H. G. Kim (1), C. Jang (2), J. Hammond (4). (1) Applied Biology, Chungnam National University, Daejeon, REPUBLIC OF (SOUTH) KOREA; (2) Central Research Institute, Kyung Nong Co. Ltd., Gyeongju, KOREA; (3) USDA ARS, Urbana, IL, USA; (4) USDA ARS Floral and Nursery Plant Research Laboratory, Beltsville, MD, USA

617-P Survey and identification of viruses infecting tomato crops in Guam
R. L. SCHLUB (1), M. Marutani (1), C. Padmanabhan (2), Z. Fei (3), K. S. Ling (2). (1) University of Guam, Mangilao, AP, USA (2) USDA-ARS, Charleston, SC, USA; (3) Boyce Thompson Institute, Ithaca, NY, USA

618-P Influence of *Beet necrotic yellow vein virus* and freezing temperatures on sugar beet roots in storage
C. A. STRAUSBAUGH, I. Eujayl. USDA ARS NWISRL, Kimberly, ID, USA

619-P Natural infection of *Sorghum bicolor* germplasm by *Sugarcane yellow leaf virus* in Florida
W. BOUKARI (1), C. Wei (1), E. Mulandesa (1), M. Hincapie (1), D. S. Molloy (2), R. Beiriger (1), P. C. Rott (1). (1) University of Florida, Belle Glade, FL, USA; (2) USDA, Beltsville, MD, USA

620-P Taxonomic consideration and molecular characterization of a novel bipartite dsRNA mycovirus from *Trichoderma atroviride* NFCF005
J. Chun, H. E. Yang, M. Jo, S. Y. Choi, D. H. KIM. Chonbuk National University, Jeonju, REPUBLIC OF (SOUTH) KOREA

621-P Effect of single and mixed infections of *Tomato severe rugose virus* (ToSRV) and *Tomato chlorosis virus* (ToCV) on plant development and virus titer
D. BAMPI (1), G. Favara (2), J. A. M. Rezende (1). (1) University of São Paulo-ESALQ, Piracicaba, BRAZIL; (2) University of São Paulo, Piracicaba, BRAZIL

622-P State-wide surveys indicated widespread distribution of grapevine leafroll than red blotch in Washington vineyards
J. ADIPUTRA, R. Naidu. Washington State University, Prosser, WA, USA

- 623-P Epidemiology of Tobacco ringspot virus causing fanleaf degeneration and decline symptoms in wine grape (*Vitis vinifera*) cultivars**
N. NATRA (1), S. Akinbade (2), A. Schultz (3), R. Naidu (1). (1) Washington State University, Prosser, WA, USA; (2) Washington State Department of Agriculture, Prosser, WA, USA; (3) Hatstrup Farms, Wapato, WA, USA
- 624-P Molecular characterization of Citrus tatter leaf virus and its detection using reverse-transcription quantitative PCR**
S. H. TAN (1), F. Osman (2), S. Bodaghi (1), T. Dang (1), S. Abuhajar (1), S. Hammado (1), G. Vidalakis (1). (1) University of California-Riverside, Riverside, CA, USA; (2) University of California-Davis, Davis, CA, USA
- 625-P Stone fruit survey efforts in Texas monitoring for Plum pox virus, European stone fruit yellows & light brown apple moth: 2016-2017**
S. C. RHODES, K. Ong. Texas A&M University AgriLife Extension Service, College Station, TX, USA
- 626-P Effect of sequence variation in the constricta strain on the protein localization and interaction of Potato yellow dwarf virus**
C. JANG (1), R. Wang (1), J. Wells (1), F. Leon (1), M. L. Farman (1), J. Hammond (2), M. M. Goodin (1). (1) University of Kentucky, Lexington, KY, USA; (2) USDA ARS Floral and Nursery Plant Research Laboratory, Beltsville, MD, USA
- 627-P Rosa species resistance to eriophyid mite populations**
K. SOLO (1), S. Collins (1), Q. Cheng (1), B. England (2), F. Hale (3), A. S. Windham (3), D. Byrne (4), N. Anderson (4), M. T. Windham (1). (1) University of Tennessee, Knoxville, TN, USA; (2) University of Tennessee, Crossville, TN, USA; (3) Soil, Plant, and Pest Center, Nashville, TN, USA; (4) Texas A&M University, College Station, TX, USA
- 628-P The ever-expanding range of tospoviruses: A case of phytosanitary risk**
C. OLAYA (1), N. Y. Velasquez (2), M. Betancourt Vasquez (3), W. Cuellar (4), H. R. Pappu (1). (1) Department of Plant Pathology, Washington State University, Pullman, WA, USA; (2) Grupo de Investigación de Sanidad Vegetal (GISAVE), Universidad Católica de Oriente, Rionegro, COLOMBIA; (3) CORPOICA, Bogota, Cundinamarca, COLOMBIA; (4) International Center for Tropical Agriculture (CIAT), Cali, Valle del Cauca, COLOMBIA
- 629-P Grapevine Pinot gris virus: An emerging virus in Napa Valley vineyards**
M. AL RWAHNIH (1), D. A. Golino (2), N. Westrick (1), A. Diaz Lara (1), M. Cooper (3), R. J. Smith (4), M. Battany (5), L. Bettiga (6), S. Zhuang (7), K. L. Arnold (2), K. Farrar (8), A. Rowhani (2). (1) Department of Plant Pathology, University of California-Davis, Davis, CA, USA; (2) University of California, Davis, CA, USA; (3) University of California, Napa, CA, USA; (4) University of California, Santa Rosa, CA, USA; (5) University of California, San Luis Obispo, CA, USA; (6) University of California, Salinas, CA, USA; (7) University of California Cooperative Extension - Fresno County, Fresno, CA, USA; (8) Foundation Plant Services, Davis, CA, USA
- 630-P The prevalence of viruses in Ohio wheat fields**
B. A. HODGE (1), L. R. Stewart (2), P. A. Paul (3). (1) The Ohio State University, Wooster, OH, USA; (2) USDA ARS, Wooster, OH, USA; (3) Ohio State University, Ohio Agricultural Research and Development Center, Department of Plant Pathology, Wooster, OH, USA
- 631-P Effect of Bell pepper endornavirus to bell pepper (*Capsicum annuum*)**
C. ESCALANTE GUARDADO (1), R. A. Valverde (1,2). (1) Louisiana State University AgCenter, Baton Rouge, LA, USA; (2) Department of Plant Pathology and Crop Physiology, Louisiana State University AgCenter, Baton Rouge, LA, USA
- 632-P An endornavirus from cluster bean (*Cyamopsis tetragonoloba*)**
R. I. ALCALÁ-BRISEÑO (1), F. Herrera (2), R. A. Valverde (3). (1) University of Florida, Gainesville, FL, USA; (2) Louisiana State University AgCenter, Baton Rouge, LA, USA; (3) Department of Plant Pathology and Crop Physiology, Louisiana State University AgCenter, Baton Rouge, LA, USA
- 633-P Endornaviruses of *Capsicum* species**
R. I. Alcalá-Briseño (1), C. Escalante Guardado (2), R. A. VALVERDE (3). (1) University of Florida, Gainesville, FL, USA; (2) Louisiana State University AgCenter, Baton Rouge, LA, USA; (3) Department of Plant Pathology and Crop Physiology, Louisiana State University AgCenter, Baton Rouge, LA, USA
- 634-P Recovery from Ilarvirus symptoms in cranberry**
S. THOMAS-SHARMA, R. Page, T. L. German, P. S. McManus. University of Wisconsin-Madison, Madison, WI, USA
- 635-P A survey for grapevine viruses in Tennessee vineyards**
N. SOLTANI (1), D. D. Hensley (1), D. Lockwood (2), M. Staton (1), K. L. L. Perry (3), M. R. Hajimorad (1). (1) University of Tennessee, Department of Entomology & Plant Pathology, Knoxville, TN, USA; (2) University of Tennessee, Department of Plant Sciences, Knoxville, TN, USA; (3) Cornell University, Plant Pathology & Plant-Microbe Biology Section, Ithaca, NY, USA
- 636-P Genetic diversity of pepper and tomato-infecting begomoviruses in eastern Thailand**
W. S. TSAI, L. T. Shen. National Chiayi University, Chiayi, TAIWAN
- 637-P Prevalence of viruses associated with maize lethal necrosis (MLN) in Tanzania**
D. P. Massawe (1), L. R. STEWART (2). (1) The Ohio State University, Wooster, OH, USA; (2) USDA ARS, Wooster, OH, USA
- 638-P Molecular characterization of divergent Grapevine leafroll-associated virus 3 isolates in California, U.S.A.**
M. AL RWAHNIH (1), V. Klaassen (2), K. Stevens (3), K. L. Arnold (4), H. J. Maree (5), N. Westrick (1), D. A. Golino (4). (1) Department of Plant Pathology, University of California-Davis, Davis, CA, USA; (2) Foundation Plant Services, Davis, CA, USA; (3) Department of Evolution

and Ecology, University of California-Davis, Davis, CA, USA; (4) University of California, Davis, CA, USA; (5) Stellenbosch University, Stellenbosch, SOUTH AFRICA

639-P Grapevine vein clearing virus is prevalent in wild plant species

C. KEITH, S. Petersen, W. Qiu. Missouri State University, Springfield, MO, USA

640-P Association of Grapevine leafroll-associated virus 2 with atypical symptoms on Pinot Noir grapevines in California

H. E. MCCOWN (1), J. Vo (1), M. R. Sudarshana (2). (1) University of California-Davis, Davis, CA, USA; (2) USDA-ARS, Davis, CA, USA

641-P A new virus in Luteoviridae is associated with raspberry leaf curl disease

P. DI BELLO (1), A. Diaz Lara (2), R. R. Martin (3). (1) Oregon State University, Corvallis, OR, USA; (2) Foundation Plant Services, University of California -Davis, Davis, CA, USA; (3) USDA ARS, Corvallis, OR, USA

642-P Prevalence, distribution, and characterization of major viral diseases of sugarcane from southern India

R. K. N (1), V. K. K. Kotamraju (2), S. S. UPPALA (3). (1) Acharya N G Ranga Agricultural University, Anakapalle, INDIA; (2) Acharya N G Ranga Agricultural University, Regional Agricultural Research Station, Anakapalle, INDIA; (3) Texas A&M University AgriLife Research, Beaumont, TX, USA

Volunteer



Indicate your interest in unique APS volunteer activities! Stop by the volunteer board located near the APS registration desk and pin your **"Volunteer Ticket"** to show what activity you might like to try. You will be contacted after the meeting to get started.



Thank You, Sustaining Associates!

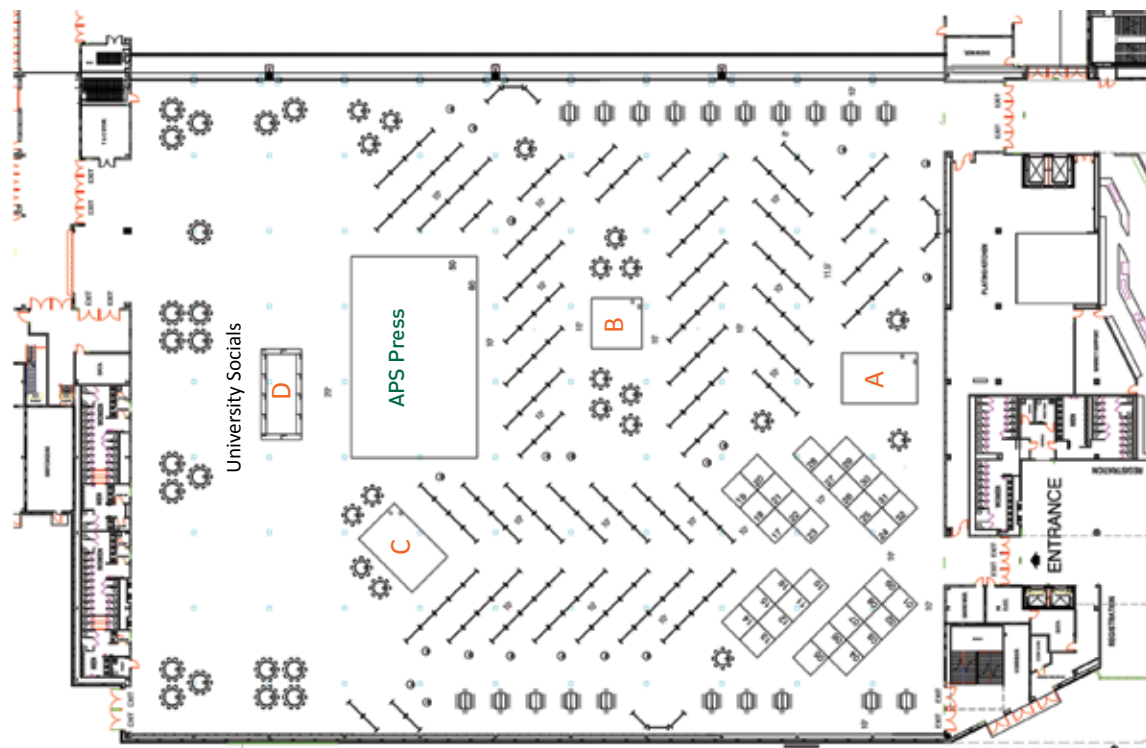
APS is truly appreciative of the continued support and involvement from its Sustaining Associate Members who help create solutions and build relationships to advance the science of plant pathology.

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EXHIBIT HALL FLOOR PLAN

Representatives from leading industry suppliers will be at this year's annual meeting to answer questions and share information on products and services. Thank you to all our 2017 exhibitors for being a part of this meeting! Exhibitors are listed as of June 23, 2017. Visit apsnet.org/meet for updates. Descriptions of exhibiting companies can be found on the mobile app. The floor plan can also be found on the mobile app.



- A. One-to-One (1:1) Conversation with an Expert
- B. The Gathering Garden
- C. APS Sprouts Kid's Corner
- D. OIP Silent Auction (Monday) & Career Fair (Tuesday)

Exhibitor list in numerical order of assigned booth numbers.

- | | | |
|--|--|--|
| 01 TwistDx
twistdx.co.uk | 12 Sociedade Brasileira de Fitopatologia (SBF)
sbfito.com.br | 21 Biolog Inc.
biolog.com |
| 03 APS Office of Public Relations & Outreach
apsnet.org/members/outreach/opro | 13 Microbiology Internations
800ezmicro.com | 23 BioChambers Incorporated
biochambers.com |
| 04 Bioreba AG/Eurofins BioDiagnostics Inc.
eurofinsus.com/biodiagnostics | 14 Percival Scientific, Inc.
percival-scientific.com | 24 USDA-APHIS
aphis.usda.gov |
| 05 ADAMA
adama.com | 15 Midco Global
midcoglobal.com | 26 PathSensors, Inc.
pathsensors.com |
| 06 Texas A&M University Plant Pathology & Microbiology
plantpathology.tamu.edu | 16 Dino-Lite Scopes (BigC)
dinolite.us | 27 APS Diagnostics Committee |
| 07 Conviron
conviron.com | 17 Gylling Data Management Inc.
gdmdata.com | 28 PhytoTechnology Laboratories
phytotechlab.com |
| 08 Monsanto
monsanto.com | 18 APS Public Policy Board
apsnet.org/members/outreach/ppb | 29 Environmental Growth Chambers
egc.com |
| 10 OPTIGENE
optigene.co.uk | 19 Agro Research International LLC
agroresearchinternational.com | 30 ACSESS Alliance of Crop, Soil & Environmental Science Societies
dl.sciencesocieties.org |
| 11 Pro-Lab Diagnostic
pro-lab-direct.com | 20 AC Diagnostics Inc.
acdiainc.com | 31 Agdia Inc.
agdia.com |

Thank You Committee Members

What a Difference 1,300+ Members Make

Amazingly, more than 1,300 members are actively engaged in APS through their contributions on various boards, offices, forums, divisions, task forces, working groups, and committees. APS volunteers tackle important issues and cover the breadth of the science as well as key policy, program, product, and societal priorities. APS simply wouldn't be what it is without the commitment and involvement of the membership. Special thanks to everyone who served in this capacity this year! For a comprehensive, up-to-date, listing linking you to all the branches of APS leadership visit apsnet.org/members/apsleadership/. The majority of these groups meet during the annual meeting and welcome new participation. View the daily schedule and plan to join in and learn more about how you can be involved!

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Sunday Awardees

Congratulations 2017 APS Fellow Award Recipients

Congratulations to this year's APS Fellows who have been selected for their significant contributions in one or more of the following areas: original research, teaching, administration, professional and public service, and/or extension and outreach. Join us on **Sunday, August 6, at 10:30 a.m. in the Opening General Session** to celebrate these APS Fellow awardees and their accomplishments. Biographies on each of the awardees is available atapsnet.org/members/awards/Pages/2017AwardeesAnnounced.aspx.



Thomas J. Baum, Iowa State University, U.S.A.

Dr. Baum has been selected to receive this award in recognition of his pioneering contributions that have advanced our understanding of effector proteins from nematodes and the molecular signals that occur between the nematodes and their host plants.



Gary P. Munkvold, Iowa State University, U.S.A.

Dr. Munkvold has been selected to receive this award in recognition of his contributions to seed health testing and the epidemiology and management of seed and seedling pathogens and phytosanitary guidelines and for his distinguished service to APS.



Andrew F. Bent, University of Wisconsin, U.S.A.

Dr. Bent has been selected to receive this award in recognition of his research that has significantly advanced our knowledge of molecular mechanisms underlying plant disease resistance, such as cloning the Rhg1 R gene in soybeans and the 'floral dip' Arabidopsis transformation protocol that is widely used.



David M. Rizzo, University of California, U.S.A.

Dr. Rizzo has been selected to receive this award in recognition of his pioneering work on sudden oak death as well as the outreach to educate undergrads in the importance of plant diseases and the interface of science and society.



Glen L. Hartman, USDA ARS, U.S.A. Dr. Hartman has been selected to receive this award in recognition of his global expertise on Asian soybean rust and many other soybean diseases and his collaborative efforts with breeders to develop disease control solutions.



Wayne F. Wilcox, Cornell University, U.S.A.

Dr. Wilcox has been selected to receive this award in recognition of his global expertise in the biology and control of grape diseases and for work in resistance management with subsequent dissemination of information to growers, industry, and regulatory authorities.



Seogchan Kang, Pennsylvania State University, U.S.A.

Dr. Kang has been selected to receive this award in recognition of his efforts to catalog/store accumulated data and knowledge for future reference and development of molecular diagnostics tool kits in preparation of invasive pathogens.



Brenda D. Wingfield, University of Pretoria, South Africa

Dr. Wingfield has been selected to receive this award in recognition of her research on molecular and genomic characterization of fungal pathogens on trees and for the educational outreach to the young scientists of Africa.



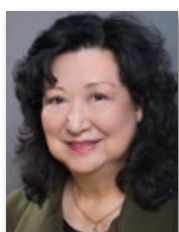
Yong-Hwan Lee, Seoul National University, Korea

Dr. Lee has been selected to receive this award in recognition of his outstanding work in understanding the molecular and genomic basis for the causal agent of rice blast by characterizing and analyzing hundreds of transcription factors to understand the fungus-plant interactions.



Xiangming Xu, NIAB East Malling Research, United Kingdom

Dr. Xu has been selected to receive this award in recognition of his significant contribution to epidemiology and modeling of diseases in fruit trees and other small fruits that have found practical applications to help growers and for work to understand the microbial ecology to improve crop production.



Jennifer H. McBeath, University of Alaska Fairbanks, U.S.A.

Dr. McBeath has been selected to receive this award in recognition of her international collaboration resulting in market access and developing production practices and biocontrol methods for arctic conditions.

Monday Awardees

Congratulations 2017 APS Excellence and Named Award Recipients

Congratulations to APS's Excellence and Named Award recipients who have been selected to receive awards in honor of their significant contributions to the science of plant pathology. Join us on **Monday, August 7, at 9:30 a.m. in the Plenary Session** to celebrate the accomplishments of the following APS awardees. Biographies on each of the awardees is available at www.apsnet.org/members/awards/Pages/2017AwardeesAnnounced.aspx.



Excellence in Extension Award

Frank J. Louws, *North Carolina State University, U.S.A.*

Dr. Louws has been selected to receive this award in recognition of the quality and utility of his published extension bulletins and digital-based information as well as his development of alternative strategies for disease control for growers in the Southeast.



Lee M. Hutchins Award

Megan M. Dewdney, *University of Florida, U.S.A.*

Dr. Dewdney has been selected to receive this award in recognition of her recent publications in APS journals on the epidemiology and management of new citrus diseases and development of novel management strategies for citrus HLB.



Excellence in International Service Award

Ranajit Bandyopadhyay, *IITA*

Dr. Bandyopadhyay has been selected to receive this award in recognition of his contributions to efforts to control aflatoxin in sub-Saharan Africa via local atoxigenic strains of *A. flavus* and for the creation of labs for testing in other countries.



Noel T. Keen Award for Research Excellence in Molecular Plant Pathology

Martin B. Dickman, *Texas A&M University, U.S.A.*

Dr. Dickman has been selected to receive this award in recognition of his pioneering research on programmed cell death and the role this plays in controlling plant disease and plant stress responses; this could lead to new strategies and products for enhancing crop productivity.



Excellence in Teaching Award

Brantlee Spakes Richter, *University of Florida, U.S.A.*

Dr. Spakes Richter has been selected to receive this award in recognition of her contributions to classroom teaching to science and non science majors alike and her ability to make learning engaging and fun.



William Boright Hewitt and Maybelle Ellen Ball Hewitt Award

Lina Maria Quesada, *North Carolina State University, U.S.A.*

Dr. Quesada has been selected to receive this award in recognition of the quality and utility of her efforts to study resistance via genetic changes in the pathogen population when fungicides are applied; she excels at integrating basic and applied research with her eye on the stakeholders in both developed and developing countries.



Ruth Allen Award

Hailing Jin, *University of California, U.S.A.*

Dr. Jin has been selected to receive this award in recognition of her discovery of cross-kingdom RNAi during plant-pathogen interaction and potential use of RNA-based fungicides.



Syngenta Award

Anna E. Whitfield, *Kansas State University, U.S.A.*

Dr. Whitfield has been selected to receive this award in recognition of her research into the events leading to virus acquisition and transmission by arthropod vectors that could

2017 APS Foundation Awards

Congratulations to the 2017 APS Foundation Awardees

The APS Foundation is excited to announce the names of 60 individuals who received awards from the APS Foundation in 2017, totaling more than \$38,000 in awards. Awardees will be recognized **during the Opening Session** of the APS Annual Meeting. Special thanks to everyone who donated to the APS Foundation! Your continued support makes these opportunities possible. Be sure to visit the foundation's booth to learn more about funding opportunities and to help support future leaders in plant pathology!

lead to new strategies in virus control.

Books for the World Award

Sylvester Aigbe, *Ambrose Alli University, U.S.A.*

Browning Plant Medicine and Health Travel Award

Salvador Ramirez, *University of Nebraska-Lincoln, U.S.A.*

Frank L. Howard Undergraduate Fellowship Award

Juliana González Tobón, *Universidad de los Andes, Colombia*

Lucy Hastings de Gutiérrez Award for Excellence in Teaching

Brantlee Spakes Richter, *University of Florida, U.S.A.*

Noel T. Keen Award for Research Excellence in Molecular Plant Pathology

Martin (Marty) B. Dickman, *Texas A&M University, U.S.A.*

Don and Judy Mathre Educational Endowment Award

Joseph Hulbert, *Forestry and Agricultural Biotechnology Institute, U.S.A.*

Don and Judy Mathre Student Educational Award

Rodrigo Borba Onofre, *University of Florida – Gulf Coast Research and Education Center, U.S.A.*

Plant Pathology Experiential Award – Individual

Mihir Mandal, *USDA ARS, U.S.A.*

Plant Pathology Experiential Award – Department

University of Georgia Plant Pathology Department, *U.S.A.*

17th I. E. Melhus Graduate Student Symposium

Elizabeth Cieniewicz, *Cornell University, U.S.A.*

Alyssa Koehler, *North Carolina State University, U.S.A.*

Ravin Poudel, *University of Florida, U.S.A.*

Hsien-Tzer Tseng, *North Carolina State University, U.S.A.*

International Travel Award

Diego Fernando Quito-Ávila, *Centro de Investigaciones Biotecnológicas del Ecuador, Ecuador*

JANE International Service Award

Ranajit Bandyopadhyay, *International Institute of Tropical Agriculture, Nigeria*

JANE Research Award

Diana Schultz, *Florida Gulf Coast University, U.S.A.*

Raymond J. Tarleton Student Fellowship Award

Ananda Bandara, *Kansas State University, U.S.A.*

Schroth Faces of the Future Early Career Professionals Symposium Awardees

Alejandra Huerta, *Colorado State University, U.S.A.*

Brian Kvitko, *University of Georgia, U.S.A.*

Febina Mathew, *South Dakota State University, U.S.A.*

Christopher Wallis, *USDA ARS, U.S.A.*

Student Travel Awards

2017 Undergraduate Awardee

Donald E. Mathre Student Travel Award

Melissa Regnier, *Universidad de los Andes, Colombia*

John F. Fulkerson Student Travel Award

Kelly Allen, *University of Massachusetts-Amherst, U.S.A.*

H. J. Dubin Student Travel Award in honor of the Peace Corps

Lourena Arone, *University of Arizona, U.S.A.*

Eugene S. Saari and John F. Schafer Joint Student Travel Award

Anita Behari, *The Pennsylvania State University, U.S.A.*

Inaugural Lisa Shepherd Student Travel Award

Shannon Carmody, *Washington State University, U.S.A.*

Malcolm C. Shurtleff Student Travel Award

Ranwnaq Chowdhury, *South Dakota State University, U.S.A.*

Virology Student Travel Award

Will Cody, *Texas A&M University, U.S.A.*

J. Artie and Arra Browning Student Travel Award

Stephen Cohen, *Colorado State University, U.S.A.*

Myron K. Brakke Student Travel Fund

Washington da Silva, *Cornell University, U.S.A.*

Joseph Kuc Student Travel Award

Megan Daniels, *Cornell University, U.S.A.*

Albert Paulus Student Travel Award

Bruna Forcelini, *University of Florida, U.S.A.*

Luis Sequeira Student Travel Award

Gretchen Freed, *Washington State University, U.S.A.*

Donald E. Munnecke Student Travel Award

Nikita Gambhir, *University of Nebraska, U.S.A.*

Tsune Kosuge Student Travel Award

Donald Gillis, *University of Georgia, U.S.A.*

Stephen A. Johnston and Joseph P. Fulton Joint Student Travel Award

Stacey Haack, *University of California-Riverside, U.S.A.*

Indian Phytopathological Society Student Travel Award

Himadri Kaushik, *Assam Agricultural University, India*

Kenneth and Betty Barker and Stuart D. Lyda Joint Student Travel Award

Ram Khadka, *The Ohio State University, U.S.A.*

Roger C. Pearson Student Travel Award
Roshni Kharadi, *Michigan State University, U.S.A.*

Larry Wallace Moore and Dennis H. Hall Joint Student Travel Award
Jeannie Klein, *University of Florida, U.S.A.*

Harold "Sande" McNabb, Jr. and Forest Pathology Joint Student Travel Award
Elisa Lauritzen, *Utah State University, U.S.A.*

Dow AgroSciences and Harry Ernest Wheeler Joint Student Travel Award
Ningxiao Li, *The Pennsylvania State University, U.S.A.*

Janell M. Stevens Johnk Student Travel Award
Prabha Liyanapathirana, *Tennessee State University, U.S.A.*

Arthur Kelman Student Travel Award
Amelia Lovelace, *University of Georgia, U.S.A.*

Robert W. Fulton Student Travel Award
Lauri Lutes, *Oregon State University, U.S.A.*

Elsie J. and Robert Aycock Student Travel Fund
Dana Martin, *The Ohio State University, U.S.A.*

Gustaaf A. and Ineke C. M. de Zoeten Student Travel Award
Megan McCaghey, *University of Wisconsin, U.S.A.*

Milt and Nancy Schroth Student Travel Award
Michelle Oliveira, *University of Florida, U.S.A.*

H. David Thurston Student Travel Award
Viviana Ortiz Londono, *Michigan State University, U.S.A.*

William J. Moller and Kyung Soo Kim Joint Student Travel Award
Larissa Osterbaan, *Cornell University, U.S.A.*

Richard Gabrielson Student Travel Award

Kelly Paugh, *University of California-Davis, U.S.A.*
Zahir Eyal Student Travel Award
Lizbeth Pena-Zuniga, *Oklahoma State University, U.S.A.*

Jose and Silvia Amador and Caribbean Joint Student Travel Award
Sushma Ponukumati, *University of Florida, U.S.A.*

Evanthia D. and D. G. Kontaxis and Eddie Echandi Joint Student Travel Award
Maria Ratti, *University of Florida, U.S.A.*

William Malcolm Brown, Jr. and Landis International Joint Student Travel Award
John Ridenour, *University of Arkansas, U.S.A.*

Kenneth F. Baker and R. James Cook Student Travel Fund
Pummi Singh, *University of Arizona, U.S.A.*

Joseph M. Ogawa and George Herman Starr Joint Student Travel Award
Shaun Stice, *University of Georgia, U.S.A.*

Raymond G. Grogan Student Travel Award
Spencer Stumpf, *University of Georgia, U.S.A.*

C. Lee Campbell Student Travel Award
Javier Tabima, *Oregon State University, U.S.A.*

Efrat Gamliel-Atinsky Student Travel Award
Kathryn Vescio, *University of Massachusetts, U.S.A.*

Malcolm and Catherine Quigley Student Travel Award
Catherine Wram, *Oregon State University, U.S.A.*

John S. Niederhauser Student Travel Award
Tina Wu, *University of Wisconsin-Madison, U.S.A.*

Raymond D. Martyn Student Travel Award
Mei Zhao, *University of Georgia, U.S.A.*

APS 2016–2017 Division Awardees

The top awardee from each division participates in the Plant Pathologists of the Future Symposium during the annual meeting. A full list of all division awardees is posted online at apsnet.org/members/divisions/Pages/DivisionAwardees.aspx.

2017 Plant Pathologists of the Future Symposium Awardees

Caribbean Division

Rebeca Sandoval Ruiz, *Universidad de Costa Rica, Costa Rica*

North Central Division

Kyle Broderick, *University of Nebraska-Lincoln, U.S.A.*

Northeastern Division

Megan Hall, *Cornell University, U.S.A.*

Pacific Division

Leslie Holland, *University of California-Davis, U.S.A.*

Potomac Division

Terence Mhora, *University of Delaware, U.S.A.*

Southern Division

Patricia Soria, *University of Florida, U.S.A.*

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Invitation to the International Congress of Plant Pathology 2018

APS hosts ICPP 2018 in Boston for a unique opportunity to engage



Next summer Boston will become the epicenter of plant pathology science, research and knowledge during what is sure to be a historic convening of International Congress of Plant Pathology (ICPP). Do not miss the rare opportunity to conduct invaluable face-to-face dialogues with leading experts from around the world. Consume a wealth of science and research from international delegates. Network with the diverse community of plant pathology scientists.

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APS has the honor and privilege of hosting the 11th International Congress of Plant Pathology (ICPP2018) from July 29 to August 3, 2018 in the great city of Boston! As the host society, APS will not hold its usual APS annual meeting in 2018, but will host ICPP2018 on behalf of the International Society of Plant Pathology (ISPP), its members, and plant health delegates from public and private sectors of countries from around the world.

“Celebrate the great progress in our profession, and look to what the future holds for assuring plant health that is earth’s wealth”

—Rick Bennett, President, ICPP2018

The theme of the 2018 International Congress of Plant Pathology (ICPP2018) is: Plant Health in a Global Economy. The vision, “An engaged world community of plant health scientists advancing knowledge for a safe, affordable, secure supply of food, feed and fiber for a growing population” reflects the broad and unique position plant pathology holds within the international community of scientists.

Although there will be no APS annual meeting in 2018, the ICPP2018 will adhere to the highest level of meeting planning, organization and scientific quality in content and scope for which APS is known throughout the world. In order to provide a comprehensive scientific program reflective of the diversity of interests from an international audience perspective within the limits of a robust week-long meeting, many APS committees, boards and offices will not host meetings during the Congress. Instead, the ICPP2018 Scientific Program Committee is asking that these meetings be held prior to the Congress, through conference calls or other vehicles of communication.

“Please join us, it is sure to be a great celebration and just maybe, it will also be a turning point in your career!”

—Greg Johnson, President, ISPP

Please be assured, that ICPP2018 will offer the latest advances, innovations, and discoveries as we explore new ways to connect with the worldwide community of plant health specialists. Our scientific program will include concurrent sessions, workshops, poster sessions, short talks, and other educational opportunities. There will also be opportunities to learn, share, and network to renew old friendships, establish new relationships and gather in a variety of social events. Our plenary and keynote sessions will offer a dynamic look into the future of plant pathology from leading experts from around the world. The ICPP2018 will bring together delegates from all parts of the world and will reflect the great diversity within the global plant pathology community.

I thank our ICPP2018 Organizing Committee and volunteers who have already selflessly committed their support and enthusiasm throughout the planning process of this Congress. Concurrent Session submissions have already closed, and the Scientific Program Committee, chaired by Scott Adkins with support from Amy Charkowski and the APS Annual Meeting Board (AMB), are currently determining Concurrent Session assignments. Plenary and keynote sessions are being planned by APS President-Elect, Mary Palm and APS Vice President Kira Bowen. ICPP2018 vice presidents, Lodovica Gullino, Serge Savary, You Liang Peng and Barbara Valent are promoting the Congress and supporting the efforts of the International Advisory Committee chaired by Sophien Kamoun. To ensure that the ICPP2018 truly reflects the diversity of plant pathology issues impacting the world, the ICPP Bursary and Finance Committee, chaired by Mike Boehm and Steve Slack, with support from several APS volunteers, are currently raising money for a Bursary Fund to help subsidize costs of attendance of plant health scientists and students from less developed nations who have limited resources from within their home country and institution. If you would like to contribute to this travel fund, please contact APS Foundation which is working closely with the Bursary and Finance Committee.

It is exciting that the ICPP2018, during the 50th anniversary of ISPP, will be held in Boston, a city strongly influenced by the massive immigration of Irish and Europeans fleeing the late blight potato famine and the “Great Famine” of the 19th Century. This famine, although not the first nor the last caused by plant pathogens, marked the beginning of plant pathology as a recognized scientific discipline and the rise to prominence of the U.S. Land Grant University System as a world leader in agricultural research.

On behalf of ISPP President Greg Johnson, Organizing Chair Tom Evans, and the entire ICPP2018 Organizing Committee, I am pleased to invite you to Boston, Massachusetts for the 2018 International Congress of Plant Pathology. Please join us in the beautiful city of Boston, July 29 – August 3, 2018. We look forward to seeing you in 2018!

More information about the program and venue can be found on the ICPP 2018 website: icpp2018.org.

Rick Bennet, ICPP2018 President ■

Save the Date



2018 is already going down in history.

For the first time in over 25 years, ICPP will convene in North America!

ISPP will celebrate its 50th anniversary!

Will YOU be in attendance?

Help to make history. Join us in Boston for ICPP2018.

Learn more at **icpp2018.org**



ICPP
BOSTON

JULY 29 -
AUGUST 3 **2018**

The International Congress of Plant Pathology (ICPP) is hosted by The American Phytopathological Society (APS) on behalf of the International Society for Plant Pathology (ISPP)

Apply for an ICPP2018 Bursary Assistance Award today!

Deadline to apply August 31, 2017



Introducing AmplifyRP® XRT+ for *Xylella fastidiosa*

Xylella fastidiosa (Xf) is a bacterial pathogen that severely impacts multiple crops in several countries around the world. Xf is most commonly known for causing Pierce's disease in grape, citrus variegated chlorosis (CVC), almond leaf scorch disease, and olive quick decline syndrome.

AmplifyRP XRT+ for Xf is an isothermal DNA amplification and detection system that offers unrivaled detection capabilities in an easy-to-use testing format. It is highly specific and offers equivalent, or better, sensitivity compared to published PCR methods while eliminating laborious and costly nucleic acid extractions. Real-time (Figure 1) or end-point (Figure 2) detection options are available. Prior molecular diagnostic experience is not required to perform AmplifyRP XRT+ tests.



Figure 1: Real-time Detection



Figure 2: End-point Detection

Assay Features / Specifications

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AmpliFire Isothermal Fluorometer (required for real-time detection)

Product Number: ACC 00090

Contents: 1 AmpliFire

Portable heat block (required for end-point detection)

Product Number: ACC 00150

Contents: Portable heat block, mini-pipettes, tips, PCR tube rack

Amplicon Detection Chamber (required for end-point detection)

Product Number: ADC 98800/0001

Contents: 1 Amplicon Detection Chamber

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