

APS Annual Meeting

July 30–August 3

Tampa, Florida

2016

Science to Practice

PROGRAM BOOK



The American Phytopathological Society

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Welcome

to the 2016 APS Annual Meeting



On behalf of The American Phytopathological Society, I'm pleased to welcome you to Tampa for the 2016 Annual Meeting. The theme this year is "Science to Practice," which celebrates the translation of basic research discoveries in plant pathology into solutions for critical problems in food security, food safety, and environmental sustainability. Our meeting will explore the latest advances, innovations, and discoveries in plant pathology and related sciences and provide a welcoming venue to connect with each other. Our first plenary session bright and early on Monday morning will feature three great examples of our science in practice, here and across the globe. Our second plenary session on Tuesday, featuring renowned scientist and author Temple Grandin, will provide us all with food for thought on how embracing our differences can make us better at our science. Our scientific program will include special, technical, and poster sessions, as well as educational opportunities including field trips and workshops. As always, we encourage you to take full advantage of the many social gatherings and networking events to renew old friendships, establish new ones, and engage with plant pathologists from all over the world.

Welcome to the 2016 APS Annual Meeting. We're glad to see you in Tampa!

Sally Miller, APS President



Greetings everyone! We are assembling this week to share the latest and greatest developments in the science of plant pathology and interconnected disciplines. The planning for this meeting began over a year ago and has culminated in an exciting program with many different opportunities to learn, share, and network. You can engage and explore a wide range of topics through posters, technical and special sessions, two Plenary Sessions, Phytoviews, hot topics, and the many social events planned for the next few days. New this year are Pathologists of Distinction (PODs), talking about the personal side of their career as a plant pathologist and the things that inspired them. Students and first-timers—join in the mix and introduce yourselves to fellow meeting participants: join a committee (no invitation needed), sit in on an Idea Café, and contribute to the discussion around a Poster Huddle. The meeting app is back and with free wi-fi available throughout the convention center, it will help us all find and remember all of our "must do" events and stay connected. I wish you all a great meeting in Tampa!

Tim Murray, 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 #Phytopath16 throughout the meeting and follow @plantdisease.
- Like The American Phytopathological Society on Facebook.
- Join The American Phytopathological Society group on LinkedIn.



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 their professional development and the science of plant pathology. 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.



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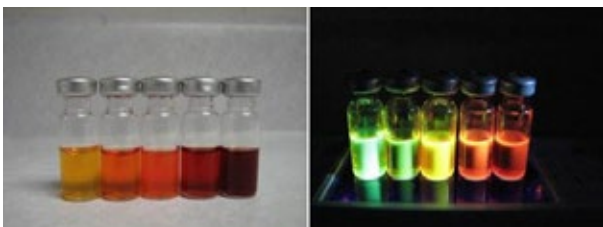
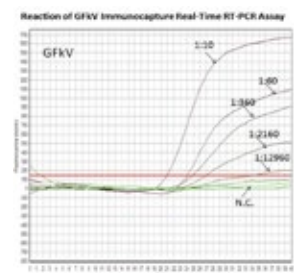
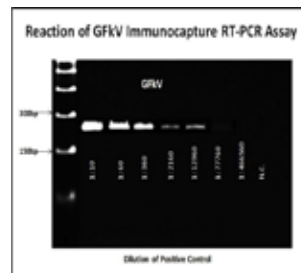
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Why use the app?
More content than the Program Book + features connecting you with other attendees and the latest updates.....**and it is FREE!**

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

West Exhibit Hall Lobby, Convention Center

Saturday, July 30	12:00 – 6:00 p.m.
Sunday, July 31	7:00 a.m. – 6:00 p.m.
Monday, August 1	7:30 a.m. – 6:00 p.m.
Tuesday, August 2	7:30 a.m. – 5:30 p.m.
Wednesday, August 3	7:30 a.m. – 2:00 p.m.

Exhibit and Poster Hours

West Exhibit Hall, Convention Center

Sunday, July 31

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.	Welcome Reception with Exhibition and Posters
4:00 – 6:00 p.m.	Poster Viewing

Monday, August 1

10:00 a.m. – 6:00 p.m.	Poster Viewing
10:00 a.m. – 6:00 p.m.	Exhibits Open
2:00 – 6:00 p.m.	<i>New Day and Time!</i> OIP Silent Auction
2:30 – 3:00 p.m.	Poster Huddles – <i>see page 47 for a list of topics</i>
3:00 – 5:00 p.m.	Poster Viewing with Authors Present
3:00 – 4:00 p.m.	Posters 1–400 (even-numbered posters)
4:00 – 5:00 p.m.	Posters 401–804 (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 2

8:00 a.m. – 6:00 p.m.	Poster Viewing
10:00 a.m. – 6:00 p.m.	Exhibits Open
3:00 – 3:30 p.m.	Poster Huddles – <i>see page 47 for a list of topics</i>
3:00 – 5:30 p.m.	New! Career Fair
3:30 – 5:30 p.m.	Poster Viewing with Authors Present
3:30 – 4:30 p.m.	Posters 1–400 (odd-numbered posters)
4:30 – 5:30 p.m.	Posters 401–804 (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 3

8:30 – 10:00 a.m.	Poster Viewing, Poster Huddles, and Exhibits
10:00 – 11:00 a.m.	Poster Take-Down
10:00 a.m. – 12:00 p.m.	Exhibit Take-Down

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

Several concession stands will be open throughout the convention center Sunday – Wednesday for breakfast and lunch items in addition to coffee, beverages, and more. “The Sail” outdoor concession (next to the convention center) will be open for lunch each day beginning at 11:00 a.m.

Open Meeting Room

A small meeting room for up to 16 people is available for use during the meeting at the Tampa Convention Center. To check availability and reserve a room, stop by the Registration Desk.

Speaker Ready Room

Room 17, 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, July 30	4:00 – 8:00 p.m.
Sunday, July 31	9:00 a.m. – 5:00 p.m.
Monday, August 1	7:00 a.m. – 4:00 p.m.
Tuesday, August 2	7:00 a.m. – 4:00 p.m.
Wednesday, August 3	7:00 a.m. – 12:00 p.m.

Network, Connect, Find New Talent— New! Career Fair

If you are looking for a new job or a new employee, it's all about networking. The APS Annual Meeting is the perfect venue for making these connections. Post your job or candidate information on the Job Board by the Registration Desk. Visit the Early Career Professionals' Social on Monday, August 1, to hear first-hand from employers about various career opportunities. And new this year, registered employers from industry, academia, and government will host tables at the 2016 APS Career Fair, Tuesday, August 2 from 3:00 – 5:30 p.m. in the Exhibit Hall. Bring your resumes and your business cards to land your dream position or learn more about working at a top APS organization.

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 2016 Foundation awardees and funding initiatives for 2017 and beyond. Donors contributing \$100 or more to the fund of their choice receive a copy of Temple Grandin's book *Thinking in Pictures* (limited number of copies, first-come, first-serve). Grandin has offered to sign the books following Tuesday's Plenary Session. Students donating at least \$20 will be entered into a drawing to win a \$500 travel grant to next year's annual meeting!



New Day and Time! OIP Silent Auction

Support global awareness with a Silent Auction bid! A grand selection of items from around the world will again be available at this year's 12th Annual Silent Auction. Proceeds fund the APS Office of International Program's Global Experience Program. **NEW PLACE, NEW TIME!** This year's auction will take place in the Exhibit Hall on Monday, August 1, 2:00 – 6:00 p.m.



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

Tampa Convention Center

333 South Franklin Street, Tampa, FL 33602
+1.813.274.8511

Marriott Waterside Hotel

700 South Florida Ave., Tampa, FL 33602
+1.813.221.4900

Embassy Suites

513 South Florida Ave., Tampa, FL 33602
+1.813.769.8300

Offsite Venues

Industry & Extension Networking Event

Monday, August 1, 6:30 – 9:30 p.m.

Yacht StarShip (*ship will dock at the convention center*)

LGBTQ Social and Networking Hour

Tuesday, August 2, 6:00 – 7:00 p.m.

Champion's Restaurant (*located in the Marriott Waterside Hotel*)

Committee for Diversity and Equality presents “#You and Diversity” Workshop

Tuesday, August 2, 7:00 – 9:00 p.m.

Champion's Restaurant (*located in the Marriott Waterside Hotel*)

Safety Tips

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

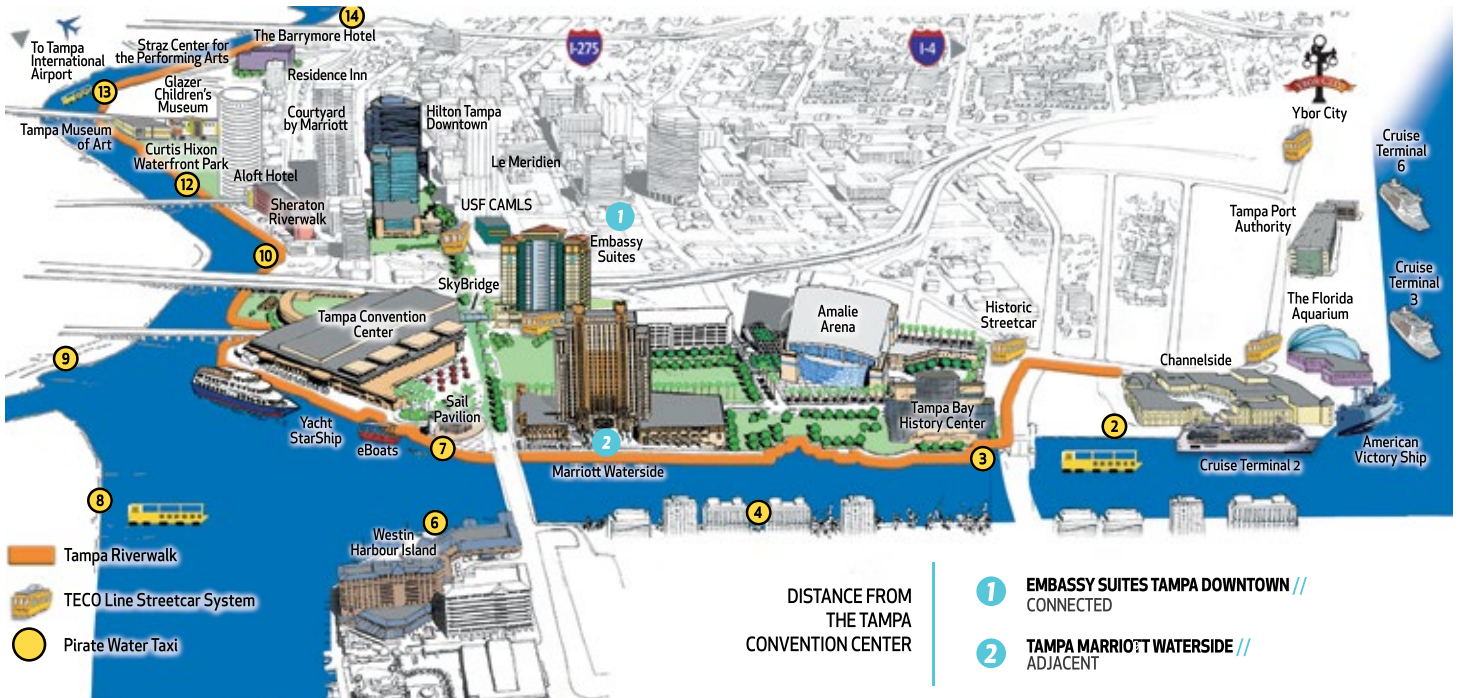
Remove name badges when outside the hotel or convention center unless you are participating in a meeting event.

- 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.

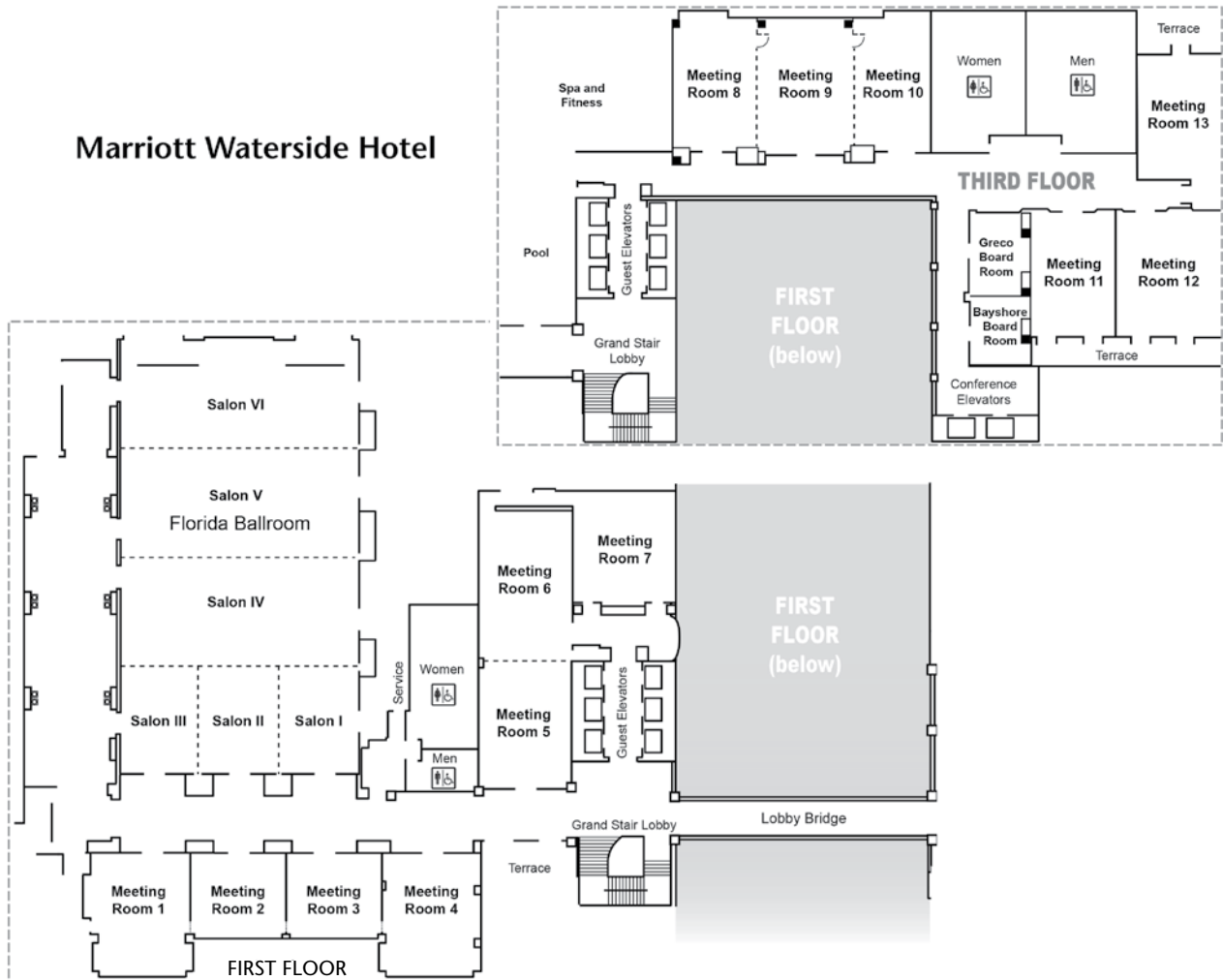
Procedures in Case of a Fire

- 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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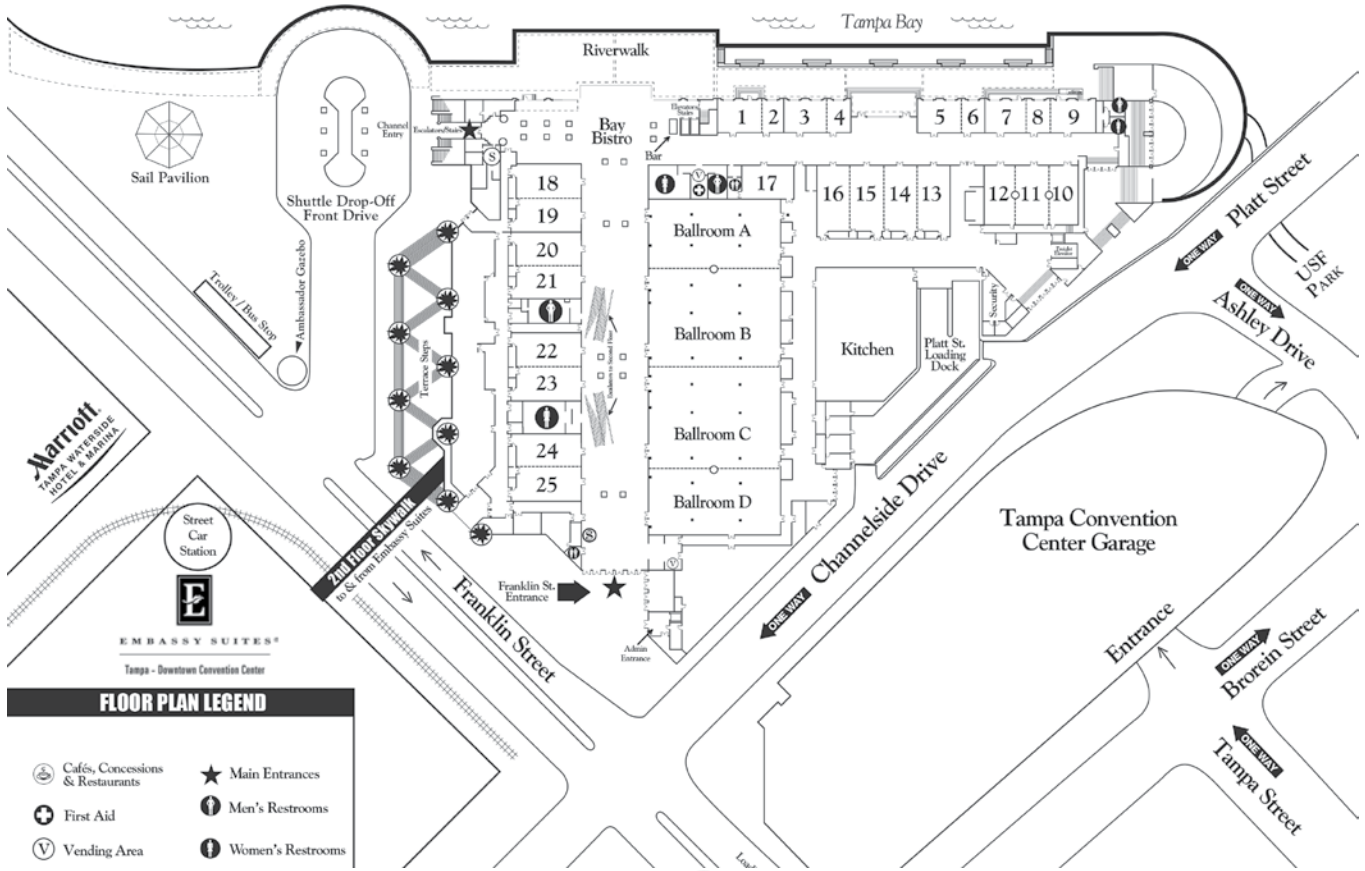
Marriott Waterside Hotel



CONVENTION CENTER

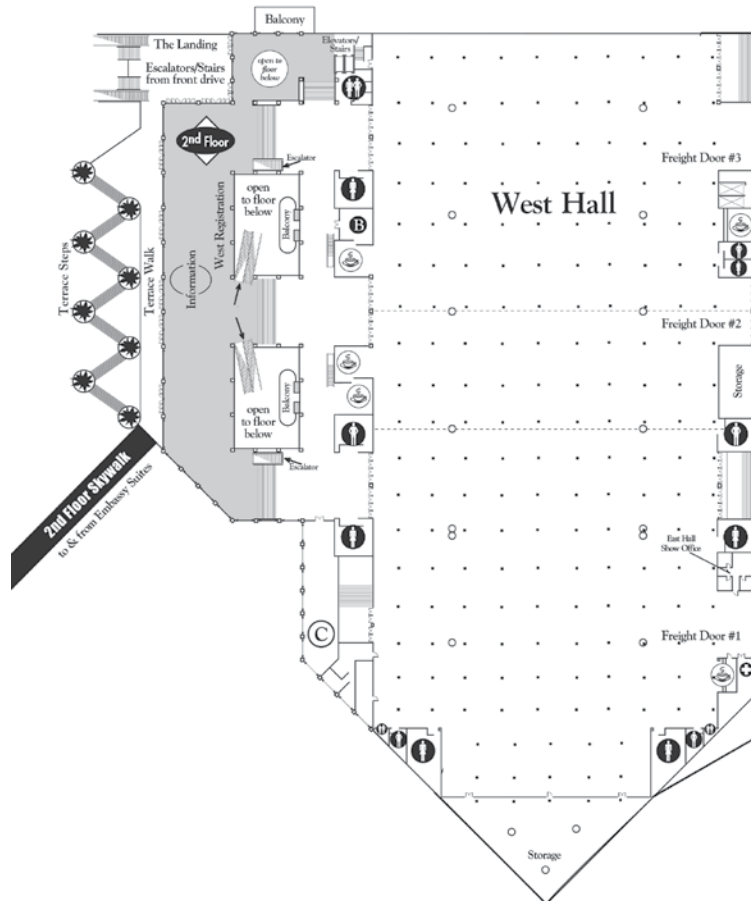
Tampa Convention Center

1st Floor



FLOOR PLAN LEGEND

- Cafés, Concessions & Restaurants
- Main Entrances
- First Aid
- Men's Restrooms
- Vending Area
- Women's Restrooms





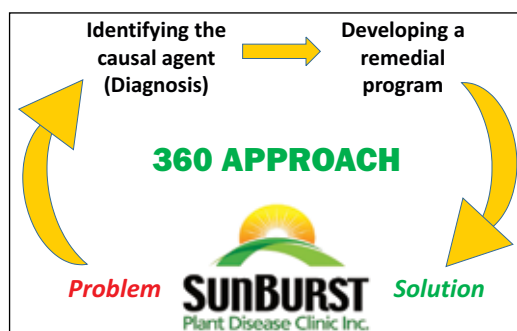
SUNBURST

Plant Disease Clinic Inc.

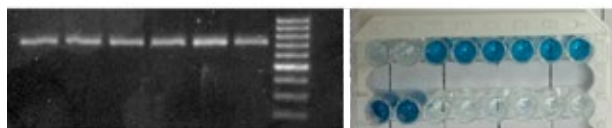
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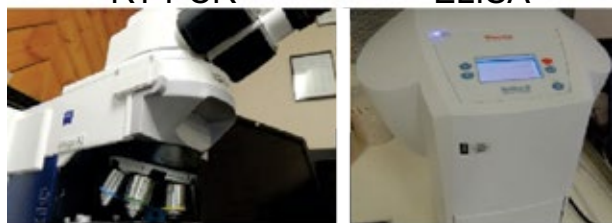


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UNIQUE APPROACHES TO THE EXCHANGE OF SCIENCE

PhytoView Sessions

Biologicals and Biological Control: The Next-Generation of Plant Health Products?

Monday, August 1, 10:15 – 11:30 a.m.; Room 22–23, Convention Center

Changing Regulations in the Face of Changing Technology

Tuesday, August 2, 1:30 – 2:45 p.m.; Room 24–25, 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 20.

Idea Cafés

New day and time! Wednesday, August 3, 9:00 – 10:00 a.m.; West 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 or interest to you! For a complete listing of table topics, see page 24 of the Program Book.

New for 2016!

PODs—Conversations with Pathologists of Distinction

Sunday, July 31, 1:00 – 2:00 p.m.; Room 13, Convention Center

Monday, August 1, 1:00 – 2:00 p.m.; Room 13, Convention Center

Based on the well-known and popular TED talks format (Technology, Entertainment, Design), conversations with Pathologists of Distinction (PODs) offers 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 see page 17.

Opening General Sessions and Awards & Honors Ceremony

Sunday, July 31, 10:30 a.m. – 12:00 p.m.; Ballroom BC, Convention Center

Your official welcome to the meeting! Connect with friends and fellow scientists from around the world as we recognize APS members with awards and honors for their work throughout the year. Hear about accomplishments and goals for APS from your leaders, honor those who have left our ranks in the past year, and learn what is in store at this year’s annual meeting.

PLENARY SESSIONS

Plenary Session I (New time)

Science to Practice

Monday, August 1, 8:00 – 10:00 a.m., Ballroom BC, Convention Center

Introduction – Sally Miller, APS President

Emergence, Spread and Control of Maize Lethal Necrosis in East Africa



Margaret (Peg) Redinbaugh, USDA ARS Research Leader and Research Plant Molecular Geneticist, and Adjunct Professor, The Ohio State University, Wooster, OH

Redinbaugh will present the story of maize lethal necrosis (MLN), a disease that has recently broken out in East Africa, threatening a staple food and key determinant of food security for smallholder farmers. She will describe the significant progress of an international team of researchers utilizing traditional and advanced approaches to identify the disease, define epidemiological factors associated with the outbreak, and develop control strategies.

Development of Management Strategies for Xanthomonas Wilt Disease of Banana in East Africa



Leena Tripathi, Plant Biotechnologist, International Institute of Tropical Agriculture Bioscience Center, Nairobi, Kenya

Xanthomonas wilt is an invasive disease that has devastated banana, a major staple food crop, throughout East Africa in the past decade. Tripathi will describe how basic and applied research approaches have contributed to the development of management options for this disease, from advanced diagnostics to cultural practices to transgenic disease-resistant plants.

Phytobiome Ecology-Guided Insights into Novel Disease Management Approaches



Linda Kinkel, Professor, University of Minnesota, St. Paul, MN

Kinkel will present metagenomic and phenotypic compositional, functional, and network data on plant microbiomes within distinct environments. She will discuss how these data can enhance our understanding of the dynamic ecological and evolutionary processes that influence microbiome characteristics and how these data can guide the development of novel approaches for disease management.

(continued)

Plenary Session II (*New time*)

Different Kinds of Minds Are Needed to Solve Problems
Tuesday, August 2, 11:15 a.m. – 12:15 p.m.; Ballroom BC,
Convention Center



Temple Grandin, Professor of Livestock Behavior & Welfare, Colorado State University

Best-selling author, noted expert in animal behavior, and advocate for autistic populations, Grandin will share her views on effectively using the three ways people think—(1) photo-realistic visual thinking where pictures form thoughts, (2) pattern thinkers, and (3) word thinkers—in problem solving and the importance of having teams of individuals with different abilities and types of minds working together to find solutions.

Grandin earned a degree in psychology from Franklin Pierce College, a master's degree in animal science from Arizona State University, and a doctoral degree in animal science from the University of Illinois at Urbana-Champaign. She currently works as a Professor of Animal Science at Colorado State University.

Grandin has designed humane handling systems for half the cattle-processing facilities in the United States and consults with the meat industry to develop animal welfare guidelines. As a high-functioning autistic person, she has been able to make sense of and articulate her unusual life experiences with rare depth. Grandin also has an extreme sensitivity to detail and environmental change, which she credits for her insight into the minds of cattle and domesticated animals.

She has been recognized by the academic community and the general public for her work. In 2010, *TIME Magazine* listed Grandin as one of its most Important People of the Year and HBO released an Emmy Award-winning film on her life. In 2009, she was named a fellow of the American Society of Agricultural and Biological Engineers. She is the recipient of several honorary degrees and has been featured on a range of television and radio programs.

Temple Grandin photo courtesy of Rosalie Winard

Final Night Celebration— Tampa on the Bay

Wednesday, August 3,
6:30 – 9:30 p.m.; Rotunda
Area, Convention Center

Beat the heat while you take in the “Tampa experience” enjoying Florida cuisine, great conversation, and music by the Bay Kings Band! It’s a great way to wrap up the meeting and make one final connection with your colleagues and friends before heading home. *Ticket to the event and a drink ticket are included with full registration. Guest tickets are available for purchase at the Registration Desk.*



LIVE STREAMING SESSIONS—

APS Reaches Out with Global Connections

Check out live streaming during the APS annual meeting on the APS website. Share the sessions with your colleagues who are not attending the meeting. Times listed are Eastern Daylight Time.

- **Opening General Session and Awards & Honors Ceremony** · Sunday, July 31, 10:30 a.m. – 12:00 p.m.
- **Plenary Session I** · Monday, August 1, 8:00 – 10:00 a.m.
- **Plenary Session II** · Tuesday, August 2, 11:15 a.m. – 12:15 p.m.
- **Special Session:** Shovel-Ready Trees: Novel Strategies for Development of Disease Resistant Woody Plants · Monday, August 1, 10:15 – 11:30 a.m.
- **Special Session:** The Phytobiome: A New Frontier in Turfgrass Disease · Monday, August 1, 1:00 – 2:15 p.m.
- **Special Session:** Contributions of Plant Viruses to Phytobiome Research · Tuesday, August 2, 8:00 – 11:00 a.m.
- **PhytoView:** Changing Regulations in the Face of Changing Technology · Tuesday, August 2, 1:30 – 2:45 p.m.
- **Hot Topic:** Everything You Should Know About CRISPR · Wednesday, August 3, 10:15 – 11:30 a.m.
- **Special Session:** Promising Phenotyping Efforts for Understanding Genetic and Molecular Bases of Plant Disease Resistance · Wednesday, August 3, 1:00 – 4:00 p.m.



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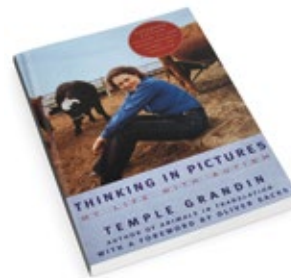
Helping Future Plant Pathologists Succeed

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

Donate \$100 or more, and receive a book by **Temple Grandin** (first come, first serve; only 50 copies available). Dr. Grandin has offered to sign your copies following her Plenary Session.

Students—Donate \$20 or more and be entered into a drawing for a **\$500 student travel award** for the 2017 Annual Meeting!

Stop by the APS Foundation Booth located near registration in the Convention Center to make your donation today.



SUNDAY afternoon

1:00 – 2:00 p.m.

POD TALK: A Conversation with Pathologists of Distinction Barbara Valent and Bob Gilbertson
• Room 13

1:00 – 2:15 p.m.

TECHNICAL SESSION: Viral Diseases • Room 18-19

2:45 – 4:00 p.m.

TECHNICAL SESSION: Latest in Fungicides
• Room 18-19

1:00 – 4:00 p.m.

SPECIAL SESSION: Dispersal at Multiple Scales: A Key to Outbreak of Disease Epidemics • Room 16

SPECIAL SESSION: Emerging Nano Materials for Disease Management and Insights from Findings in Nano-based Diagnostics • Room 24-25

SPECIAL SESSION: Novel Applications of Whole Genome Sequencing and Bioinformatics in Microbial Forensics and Agricultural Biosecurity • Room 15

SPECIAL SESSION: Role of Phytobiomes in Plant Disease Control • Room 22-23

SPECIAL SESSION: Schroth – Faces of the Future Symposium: Epidemiology and Management of Plant Diseases • Room 20-21

MONDAY morning

10:15 – 11:30 a.m.

SPECIAL SESSION: Plant Pathologists of the Future: Showcasing the Top Graduate Students from APS Division Meetings • Room 16

SPECIAL SESSION: Shovel-ready Trees: Novel Strategies for Development of Disease Resistant Woody Plants
• Room 24-25

TECHNICAL SESSION: Fungal Disease • Room 15

TECHNICAL SESSION: Nematodes • Room 14

TECHNICAL SESSION: Risk Assessment • Room 18-19

PHYTOVIEW: Biologicals and Biological Control: The next-generation of plant health products? • Room 22-23

HOT TOPIC: Future of Florida Citrus Industry • Room 20-21

MONDAY afternoon

1:00 - 2:00 pm

POD TALKS: A Conversation with Pathologists of Distinction Jacque Fletcher and Bill Fry • Room 13

1:00 – 2:15 p.m.

SPECIAL SESSION: The Phytobiome: A New Frontier in Turfgrass Disease • Room 24-25

SPECIAL SESSION: Preparing for Careers in Industry
• Room 16

SPECIAL SESSION: When Science and Politics Collide: The Good, The Bad and The Ugly • Room 15

TECHNICAL SESSION: Fungal Pathogenicity
• Room 14

TECHNICAL SESSION: Oomycete Biology
• Room 22-23

TECHNICAL SESSION: Virus-Host Interactions (ends at 2:30 p.m.) • Room 18-19

HOT TOPIC: Permitting in the Phytobiomes Era (APHIS)
• Room 20-21

TUESDAY morning

8:00 – 9:15 a.m.

TECHNICAL SESSION: Pathogen Detection • Room 16

TECHNICAL SESSION: Pathogen Ecology • Room 18-19

8:00 – 11:00 a.m.

SPECIAL SESSION: 16th I.E. Melhus Graduate Student Symposium • Room 22-23

SPECIAL SESSION: Contributions of Plant Viruses to Phytobiome Research • Room 24-25

SPECIAL SESSION: Disease Management in the Genomics Era • Room 15

SPECIAL SESSION: The Function and Mechanism of CRISPR and Its Applications • Room 20-21

SPECIAL SESSION: New Products and Services • Room 14

SPECIAL SESSION: Reviewing a Manuscript 101 • Room 13

9:45 – 11:00 a.m.

TECHNICAL SESSION: Bacterial Virulence Regulation • Room 16

TECHNICAL SESSION: Population Dynamics • Room 18-19

TUESDAY afternoon

1:30 – 2:45 p.m.

SPECIAL SESSION: Balancing a Successful Career and Family • Room 16

SPECIAL SESSION: Translational Research for the Management of Complex Diseases • Room 15

TECHNICAL SESSION: Pathogen Diversity • Room 14

TECHNICAL SESSION: Fungicide Resistance • Room 13

TECHNICAL SESSION: Host Plant Resistance • Room 18-19

TECHNICAL SESSION: Metagenomics and the Phytobiome • Room 22-23

PHYTOVIEW: Changing Regulations in the Face of Changing Technology • Room 24-25

HOT TOPIC: Intro to Phytobiome Competitive Grants (NSF/NIFA) • Room 20-21

WEDNESDAY morning

10:15 – 11:30 a.m.

TECHNICAL SESSION: Bacterial Disease Management • Room 15

TECHNICAL SESSION: Biological & Cultural Disease Management • Room 22-23

TECHNICAL SESSION: Fungal Genomics • Room 20-21

TECHNICAL SESSION: Liberibacter • Room 18-19

TECHNICAL SESSION: Plant Resistance • Room 16

HOT TOPIC: Everything You Should Know About CRISPR • Room 24-25

WEDNESDAY afternoon

1:00 – 2:15 p.m.

SPECIAL SESSION: Fieldside Manner: Serving Plant Pathology's Stakeholders • Room 18-19

SPECIAL SESSION: A Multidisciplinary Approach to Combating Rose Rosette Disease: Science to Practice • Room 16

TECHNICAL SESSION: Effector Biology • Room 20-21

TECHNICAL SESSION: Pathogen Dispersal • Room 15

1:00 – 4:00 p.m.

SPECIAL SESSION: The Impact of Vector-Borne Bacteria Pathogen on Associated Hosts • Room 22-23

SPECIAL SESSION: Promising Phenotyping Efforts for Understanding Genetic and Molecular Bases of Plant Disease Resistance • Room 24-25

2:45 – 4:00 p.m.

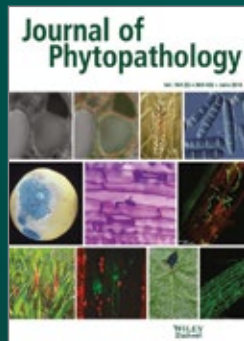
SPECIAL SESSION: See the Unseen: Metatranscriptomics Unveils Plant- and Vector-Pathogen Interactions • Room 16

TECHNICAL SESSION: Isothermal Pathogen Detection • Room 20-21

TECHNICAL SESSION: Mycotoxins • Room 15

Leading Plant Science Research

Wiley is the world's leading society publisher and a market leader in publishing Plant Science research with 3 journals ranked in the top 10 of the Plant Science category.



Journal of Phytopathology

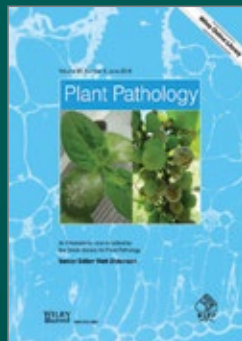
2015 Impact Factor: **0.945**



Molecular Plant Pathology

2015 Impact Factor: **4.335**

Published in association with the *British Society for Plant Pathology*



Plant Pathology

2015 Impact Factor: **2.383**

Published in association with the *British Society for Plant Pathology*



Phytotherapy Research

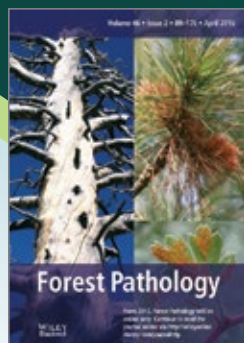
2015 Impact Factor: **2.694**



Pest Management Science

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Forest Pathology

2015 Impact Factor: **1.437**



Annals of Applied Biology

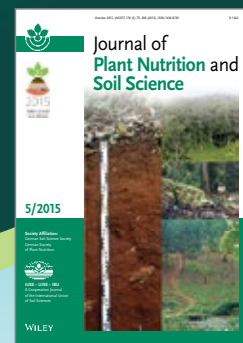
2015 Impact Factor: **2.103**

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Plant Breeding

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2015 Impact Factor: **1.816**

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WILEY

DAILY MEETING SCHEDULE AND SESSIONS

Meetings take place in the Tampa CONVENTION CENTER (CC) unless otherwise noted.

FRIDAY, JULY 29

8:30 a.m. – 12:00 p.m. FFAR Convening Meeting on Phytobiomes:
Open Community Input Session Salon IV, Marriott

All Field Trips and other bus departures leave from the Marriott Waterside Hotel.

SATURDAY, JULY 30

7:00 a.m. – 5:00 p.m. **Field Trip:** Current Status and Perspectives on Citrus Greening Disease in the State of Florida Offsite–bus departs from Marriott

7:00 a.m. – 7:30 p.m. **Field Trip:** The Greens Behind the Scenes: A Horticultural Tour of Disney World Nursery Offsite–bus departs from Marriott

8:00 a.m. – 1:00 p.m. **Field Trip:** Florida’s Fascinating Fungal Foray Offsite–bus departs from Marriott

8:00 a.m. – 5:30 p.m. **Field Trip:** From Mangrove to Pine Cone: A Look at the Current and Emerging Forest Health Issues Affecting Florida Offsite–bus departs from Marriott

8:30 – 11:30 a.m. **Workshop:** Using the R Statistical Computing Language for Reproducible Science Salon V, Marriott

8:30 a.m. – 12:00 p.m. **Workshop:** Identification of *Phytophthora* Species Using “The Online Identification Tools: Lucid Key, Tabular Key and Sequencing Analyses” Room 13, CC

8:30 a.m. – 4:30 p.m. **Workshop:** English Scientific Writing: Avoiding Some Common Errors Room 9, Marriott

9:00 a.m. – 12:00 p.m. *Phytobiomes* Journal Editorial Board Meeting Room 10, Marriott

9:00 a.m. – 4:00 p.m. **Workshop:** Bringing Advanced Diagnostic Methods to Your Lab: From RT-PCR to LAMP Room 11–12, CC

10:00 – 11:30 a.m. PMN Editorial Board Meeting, *by invitation* Room 3, Marriott

10:00 a.m. – 5:00 p.m. **Workshop:** Generalized Linear Mixed Models for Data Analysis in Plant Pathology Salon VI, Marriott

11:30 a.m. – 1:30 p.m. Office of International Programs (OIP) Board Meeting Room 2, Marriott

12:00 – 2:30 p.m. APS PRESS Editorial Board Meeting Room 8, Marriott

12:00 – 6:00 p.m. Registration West Hall Lobby, CC

1:00 – 4:00 p.m. **Workshop:** Introduction to Network Models in R Salon V, Marriott

1:00 – 4:00 p.m. **Workshop:** Make an Impact! How to Effectively Communicate Your Science Message to the Public Salon II–III, Marriott

1:00 – 5:00 p.m. GDM New ARM Software Tips and Techniques Workshop Room 10, CC

1:30 – 4:30 p.m. **Workshop:** Design and Analysis of Amplicon Sequencing for Targeted Multiplexed Genotyping Room 13, CC

2:00 – 5:00 p.m. North American Fungicide Resistance Action Committee (NA-FRAC) Meeting Room 3, Marriott

3:00 – 4:30 p.m. APS Committee Chair/Vice Chair Orientation Salon IV, Marriott

3:00 – 5:00 p.m. APS Publications Board Meeting Room 8, Marriott

4:00 – 6:00 p.m. Microbial Forensics Interest Group Room 1, Marriott

4:30 – 5:30 p.m. First Timers’ Orientation Room 14, CC

5:30 – 6:00 p.m. Undergraduate Student Primer Room 14, CC

5:30 – 6:30 p.m. *PDMR* Editors’ Meeting Room 3, Marriott

6:30 – 8:00 p.m.

Committee Meetings (open to any meeting attendee)

- Biotechnology Committee Room 13, CC
- Committee for Diversity and Equality Room 15, CC
- Diagnostics Committee Room 16, CC
- Emerging Diseases and Pathogens Committee Room 7–8, CC
- Evolutionary Genetics and Genomics Committee Salon VI, Marriott
- Forest Pathology Committee Salon V, Marriott
- Graduate Student Committee Salon IV, Marriott
- Integrated Plant Disease Management Committee Room 1, Marriott
- Pathogen Resistance Committee Room 11–12, CC
- Phyllosphere Microbiology Committee Room 18–19, CC
- Postharvest Pathology Committee Salon II–III, Marriott
- Tropical Plant Pathology Committee Salon I, Marriott

DAILY MEETING SCHEDULE AND SESSIONS

Meetings take place in the Tampa CONVENTION CENTER (CC) unless otherwise noted.

8:00 – 9:30 p.m.	Committee Meetings (<i>open to any meeting attendee</i>) <ul style="list-style-type: none"> • Biological Control • Collections and Germplasm • Epidemiology Committee • Extension Committee • Host Resistance Committee • Industry Committee • Mycotoxicology Committee • Regulatory Plant Pathology Committee • Seed Pathology Committee • Turfgrass Pathology Committee • Virology Committee 	Committee Room 15, CC Committee Room 1, Marriott Salon V, Marriott Room 16, CC Salon VI, Marriott Salon II–III, Marriott Room 13, CC Salon I, Marriott Room 12, CC Room 11–12, CC Room 18–19, CC
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■ SUNDAY, JULY 31

7:00 – 9:00 a.m.	APSnet Education Center Editorial Board Meeting	Room 3, Marriott
7:00 – 9:00 a.m.	Vegetable Seed Industry Breakfast, <i>by invitation</i>	Room 11, CC
7:00 a.m. – 6:00 p.m.	Registration	West Hall Lobby, CC
8:00 – 8:30 a.m.	Moderator Orientation	Room 24–25, CC
8:00 – 9:00 a.m.	<i>Phytopathology</i> Senior Editors' Meeting	Room 1, Marriott
8:00 – 9:00 a.m.	<i>Plant Disease</i> Senior Editors' Meeting	Room 4, Marriott
8:00 a.m. – 2:00 p.m.	Exhibit Set-Up	West Exhibit Hall, CC

8:30 – 10:00 a.m.	Committee Meetings (<i>open to any meeting attendee</i>) <ul style="list-style-type: none"> • Bacteriology Committee • Chemical Control Committee • Crop Loss Assessment and Risk Evaluation • Diseases of Ornamental Plants Committee • Molecular and Cellular Phytopathology Committee • Mycology Committee • Nematology Committee • Plant Pathogen and Disease Detection Committee • Soil Microbiology and Root Diseases Committee • Teaching Committee • Vector-Pathogen Complexes Committee 	Room 20–21, CC Room 22–23, CC Room 10, CC Salon I, Marriott Room 18–19, CC Room 16, CC Salon VI, Marriott Room 15, CC Room 7–8, CC Salon V, Marriott Salon IV, Marriott
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9:00 – 10:00 a.m.	Leadership Institute Committee Meeting	Room 2, Marriott
9:00 – 10:00 a.m.	<i>Phytopathology</i> Editorial Board Meeting	Room 1, Marriott
9:00 – 10:00 a.m.	<i>Plant Disease</i> Editorial Board Meeting	Room 4, Marriott
10:30 a.m. – 12:00 p.m.	Opening General Session and Awards & Honors Ceremony	Ballroom BC, CC
12:00 – 1:00 p.m.	Lunch Break	
12:00 – 1:30 p.m.	Widely Prevalent Plant-Pathogenic Fungi List Working Group	Room 3, Marriott
12:00 – 2:00 p.m.	Division Officers' Luncheon	Room 4, Marriott
12:00 – 2:00 p.m.	Poster Set-Up	West Exhibit Hall, CC
1:00 – 2:00 p.m.	NEW! Pathologist of Distinction (POD) Talks <i>(see page 17 for description)</i> <ul style="list-style-type: none"> • A Conversation with Pathologist of Distinction Barbara Valent: A Passion for a Fungus • A Conversation with Pathologist of Distinction Bob Gilbertson: The Challenges and Rewards of Combining Applied and Basic Research in the Context of International Research 	Room 13, CC
1:00 – 2:15 p.m.	Technical Session: Viral Diseases	Room 18–19, CC
1:00 – 4:00 p.m.	Special Session: Dispersal at Multiple Scales: A Key to Outbreak of Disease Epidemics Special Session: Emerging Nano Materials for Disease Management and Insights from Findings in Nano-Based Diagnostics	Room 16, CC Room 24–25, CC

	Special Session: Novel Applications of Whole Genome Sequencing and Bioinformatics in Microbial Forensics and Agricultural Biosecurity	Room 15, CC
	Special Session: Role of Phytobiomes in Plant Disease Control	Room 22–23, CC
	Special Session: Schroth Faces of the Future Symposium: Epidemiology and Management of Plant Diseases	Room 20–21, CC
2:00 – 3:30 p.m.	APS–IPS Working Group, <i>by invitation</i>	Room 1, Marriott
2:30 – 3:30 p.m.	<i>Plant Health Progress</i> Editorial Board Meeting, <i>by invitation</i>	Room 3, Marriott
2:45 – 4:00 p.m.	Technical Session: Latest in Fungicides	Room 18–19, CC
4:00 – 6:00 p.m.	APS PRESS Bookstore	West Exhibit Hall, CC
4:00 – 6:00 p.m.	Welcome Reception with Exhibition and Posters	West Exhibit Hall, CC
4:00 – 6:00 p.m.	Poster Viewing	West Exhibit Hall, CC
6:00 – 7:00 p.m.	University Networking Socials	West Exhibit Hall, CC (back of hall)
	<ul style="list-style-type: none"> • 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 – 8:00 p.m.	National Plant Disease Recovery System (NPDRS) Meeting	Room 4, Marriott
6:00 – 9:30 p.m.	APS Public Policy Board (PPB) Meeting	Salon I, Marriott
7:00 – 10:00 p.m.	Ornamental Virus Discussion Group	Room 1, Marriott

New for 2016! Conversations with Pathologists of Distinction

Based on the well-known and popular TED talks (Technology, Entertainment, Design), conversations with Pathologists 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.

SUNDAY, JULY 31

1:00 – 2:00 p.m.; Room 13, Convention Center



A Conversation with Pathologist of Distinction Barbara Valent: A Passion for a Fungus

Barbara Valent, APS Fellow, Distinguished Professor, Plant Pathology Department, Kansas State University

Barbara’s story: I’ve always been attracted to fungi. What a thrill to collect and eat wild mushrooms! My career path in plant pathology began when I first learned about microbe-plant interactions as an undergraduate. I was drawn to the power of genetics by a small book on ‘Genetics of Host-Parasite Interactions’ by Peter Day. A plant pathogen system where one could do rigorous genetic analysis on both pathogen and host seemed a worthy goal. Molecular genetic analyses of budding yeast had just begun, and I chose a post-doc to learn these techniques.

There, I met my soul-mate in life and science, as well as the rice blast fungus. I absorbed the passion of my first blast teachers, Frances Latterell and Hajime Kato. Doing research in industry taught me to value both foundational and applied research, and moving to academia allows me to pass my passion along. And the blast fungus has never failed to amaze!



A Conversation with Pathologist of Distinction Bob Gilbertson: The Challenges and Rewards of Combining Applied and Basic Research in the Context of International Research

Bob Gilbertson, APS Fellow, Professor, University of California-Davis

Bob’s story: World food production faces numerous challenges, including those from plant diseases. These include new diseases, global spread of pathogens, and resistance-breaking strains. Less-developed countries face more fundamental challenges such as proper

(continued)

disease diagnosis, knowledge of pathogen biology, and effective management strategies. Partnering between scientists from developed and less-developed countries provides a mutually beneficial means of solving disease problems. Approaches involve disease surveys and collections, technology transfer, training, and workshops. Examples will be provided from Brazil, the Dominican Republic, and Ghana and Mali. Lessons learned include the value of broad training in plant pathology, the need for patience and flexibility, and that opportunities exist for basic research and implementation and assessment of management strategies. These experiences enrich teaching and provide stimulating interactions with international colleagues and students. Finally, there is the gratitude of farmers who appreciate that scientists from the United States come halfway around the world to help them.

MONDAY, AUGUST 1

1:00 – 2:00 p.m.; Room 13, Convention Center



A Conversation with Pathologist of Distinction Jacquie Fletcher: A Plant Pathologist's Meandering Career Path

Jacquie Fletcher, *APS Fellow, Regents Professor, Department of Entomology & Plant Pathology, National Institute for Microbial Forensics & Food and Agricultural Biosecurity, Oklahoma State University*

Jacquie's story: The career paths I followed, usually with purpose, sometimes a-stumble, sometimes backwards, provided the most rewarding activities imaginable, in which I was supported by colleagues, mentors, students, post-docs, technicians, coauthors, and family. At the University of Illinois, when the 'viruses' we thought were causing horseradish brittleroot disease in Illinois turned out to be spiroplasmas, we studied how these weird wall-less bacteria travel in winged entomological vehicles. At Oklahoma State University, when the phytoplasma we suspected was causing

cucurbit yellow vine turned out to be the ubiquitous *Serratia marcescens*, we studied what defined a plant pathogen. APS participation enriched my career through service, networking, and experiences, leading to a significant career change. Representing APS in national responses to 9-11 and anthrax showed the need for plant pathology to address new national needs in agricultural biosecurity, and ultimately the National Institute for Microbial Forensics & Food and Agricultural Biosecurity emerged at OSU, still going strong. As my career continues to evolve, I find great satisfaction by participating in international scientific diplomacy.



A Conversation with Pathologist of Distinction Bill Fry: Messages from a Maverick, Model Microbe

Bill Fry, *APS Fellow, Professor, Cornell University*

Bill's story: The maverick model microbe is *Phytophthora infestans*. My association with this oomycete began when I, as an assistant professor with background in chemistry and biochemistry, began a faculty position in which my teaching responsibilities included developing a course on plant disease control (about which I was dramatically ignorant) and conducting appropriate research (again with dramatic ignorance). I needed to learn about disease control fast! I also needed a system in which I could address questions in epidemiology and disease control. Because senior faculty in the department already had experience with *P. infestans* and because they were willing to help an ignorant colleague, I initiated research on *P. infestans*. I couldn't ask for a better teacher. The messages have been diverse, sometimes devious, and sometimes brutal. They have involved epidemiology, population genetics, humanity, and host-pathogen interactions. I'll share some of these messages.

Meetings take place in the Tampa CONVENTION CENTER (CC) unless otherwise noted.

MONDAY, AUGUST 1

6:30 – 8:00 a.m.	Extension Plant Pathologists' Breakfast	Room 10–11, CC
7:30 a.m. – 6:00 p.m.	Registration	West Hall Lobby, CC
8:00 – 10:00 a.m.	Plenary Session: Science to Practice featuring Margaret (Peg) Redinbaugh, Leena Tripathi, and Linda Kinkel (<i>see page 9 for description</i>)	Ballroom BC, CC
10:00 a.m. – 5:00 p.m.	APS PRESS Bookstore	West Exhibit Hall, CC
10:00 a.m. – 6:00 p.m.	Exhibits Open	West Exhibit Hall, CC
10:00 a.m. – 6:00 p.m.	Poster Viewing	West Exhibit Hall, CC
10:15 – 11:30 a.m.	Special Session: Plant Pathologists of the Future: Showcasing the Top Graduate Students from APS Division Meetings (<i>ends at 11:45 a.m.</i>)	Room 16, CC
	Special Session: Shovel-Ready Trees: Novel Strategies for Development of Disease Resistant Woody Plants	Room 24–25, CC
10:15 – 11:30 a.m.	Technical Session: Fungal Disease	Room 15, CC
	Technical Session: Nematodes	Room 14, CC
	Technical Session: Risk Assessment	Room 18–19, CC
10:15 – 11:30 a.m.	PhytoView: Biologicals and Biological Control: The Next-Generation of Plant Health Products? (<i>see page 20 for description</i>)	Room 22–23, CC
10:15 – 11:30 a.m.	Hot Topic: Future of Florida Citrus Industry	Room 20–21, CC
10:15 – 11:45 a.m.	APS 2026 Professional Development Forum, <i>by invitation</i>	Room 2, Marriott
11:30 a.m. – 1:00 p.m.	Lunch Break	
11:30 a.m. – 1:00 p.m.	Graduate Student & Industry Lunch	Room 10–12, CC
11:30 a.m. – 1:00 p.m.	APS Past Presidents' Lunch, <i>by invitation</i>	Room 5, CC
11:30 a.m. – 1:00 p.m.	Storkan-Hanes-McCaslin Research Foundation Luncheon, <i>by invitation</i>	Room 3, CC
12:00 – 1:00 p.m.	USDA-ARS Meeting, <i>brown bag lunch</i>	Room 7–8, CC
12:00 – 1:00 p.m.	Widely Prevalent Viruses Committee Meeting, <i>by invitation</i>	Room 2, CC
1:00 – 2:00 p.m.	NEW! Pathologist of Distinction (POD) Talks (<i>see page 18 for description</i>)	Room 13, CC
	• A Conversation with Pathologist of Distinction Jacque Fletcher: A Plant Pathologist's Meandering Career Path	
	• A Conversation with Pathologist of Distinction Bill Fry: Messages from a Maverick, Model Microbe	
1:00 – 2:15 p.m.	Special Session: The Phytobiome: A New Frontier in Turfgrass Disease	Room 24–25, CC
	Special Session: Preparing for Careers in Industry	Room 16, CC
	Special Session: When Science and Politics Collide: The Good, The Bad and The Ugly	Room 15, CC
1:00 – 2:15 p.m.	Technical Session: Fungal Pathogenicity	Room 14, CC
	Technical Session: Oomycete Biology	Room 22–23, CC
	Technical Session: Virus-Host Interactions (<i>ends at 2:30 p.m.</i>)	Room 18–19, CC
1:00 – 2:15 p.m.	Hot Topic: Pest Permitting in the Phytobiomes Era (APHIS) Group,	Room 20–21, CC
1:30 – 3:00 p.m.	APS-SBF Working Group, <i>by invitation</i>	Room 1, Marriott
2:00 – 6:00 p.m.	OIP Silent Auction	West Exhibit Hall, CC
2:30 – 5:00 p.m.	Poster Viewing with Authors and Poster Huddles	West Exhibit Hall, CC
	2:30 – 3:00 p.m. Poster Huddles	
	HUDDLE #1 – Is globalization of agriculture contributing to the emergence of plant virus diseases?	
	HUDDLE #2 – Vector transmission of plant viruses – Is it simple or complex?	
	HUDDLE #3 – How to safeguard U.S. agriculture from pests and diseases	
	3:00 – 5:00 p.m. Poster Viewing with Authors	
	3:00 – 4:00 p.m. Posters 1–400 (<i>even numbers</i>)	
	4:00 – 5:00 p.m. Posters 401–804 (<i>even numbers</i>)	
3:30 – 5:00 p.m.	APS Divisional Forum	Room 4, CC
5:00 – 6:00 p.m.	APS Connects—Networking Social	West Exhibit Hall, CC
	<i>Grab a beverage and some popcorn and connect with colleagues and friends, drink ticket provided with registration.</i>	
5:30 – 6:00 p.m.	Early Career Professionals Committee Meeting	Room 7–8, CC
5:30 – 6:30 p.m.	Northern Plain Integrated Pest Management Working Group	Room 4, CC
6:00 – 7:00 p.m.	Early Career Professionals' Social with Employer Networking Opportunity	Room 11, CC
6:00 – 7:00 p.m.	Graduate Student Social	Room 10, CC
6:00 – 7:00 p.m.	Publications Senior Editors' Reception, <i>by invitation</i>	Room 3, CC
6:30 – 9:30 p.m.	Industry & Extension Networking Event, <i>preregistration required.</i>	Yacht StarShip
	<i>Cruise ship will dock at the convention center dinner from 6:30 – 7:30 p.m.; dinner continues with cruise from 7:30 – 9:00/9:30 p.m.</i>	

PhytoViews

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

Biologicals and Biological Control: The Next-Generation of Plant Health Products?

Monday, August 1, 10:15 – 11:30 a.m.; Room 22–23, Convention Center

Moderator: Linda Kinkel, *Professor, University of Minnesota*

Panelists and Topics:

Biologicals in Agriculture: Discovering and Testing at Scale; Scott Schaecher, *Data Strategy Lead, Biotechnology, Monsanto*

Biologicals: Past, Present and Future; David Weller, *Research Leader, Wheat Health, Genetics and Quality Research Unit, USDA-ARS*

There is currently great interest in biological-based products to improve plant health in agriculture, but this is not new. Interest in and research on biologicals in plant health and disease control was high in the 1970s, when Baker and Cook's *Biological Control of Plant Pathogens* was published. Since then, biological products have come and gone, and today they remain a relatively small component of the overall plant health tool box. Many practitioners remain skeptical of biological products. What has changed and why do we have reason to believe that biological-based products will become more important in the future of plant health?

Changing Regulations in the Face of Changing Technology

Tuesday, August 2, 1:30 – 2:45 p.m.; Room 24–25, Convention Center

Moderator: David Ouimette, *Dow AgroSciences*

Panelists and Topics:

USDA's Current Thinking on Regulatory Revisions for Biotech Plants and Plant Pathogens; Mike Firko, *Deputy Administrator, Biotechnology Regulatory Services, USDA-APHIS*

Agriculture Select Agent Services Progress Through Change; Chuck Divan, *Unit Director, Agriculture Select Agent Services, USDA-APHIS*

Perspective and Update on the U.S. Crop Protection Regulatory Landscape;

Bruce Houtman, *U.S. Crop Protection Regulatory Group, Dow AgroSciences*

Regulation in agricultural research and practice is commonplace. However, despite significant advances in biotechnology, the regulations governing genetically engineered plants and plant pests/pathogens have not changed over the past 29 years. Likewise, regulations concerning select agents have not changed since their inception in 2002. Rules governing both of these groups of organisms are being reevaluated and revisions will appear in 2016. This session will address issues and potential changes surrounding these groups of organisms, as well as examining the regulatory environment for crop protection products.



Meetings take place in the Tampa CONVENTION CENTER (CC) unless otherwise noted.

■ TUESDAY, AUGUST 2

7:00 – 8:30 a.m.	Sustaining Associates' Breakfast, <i>by invitation</i>	Room 1, Marriott
7:00 – 9:00 a.m.	Annual Meeting Board Meeting, <i>by invitation</i>	Room 4, CC
7:30 – 9:30 a.m.	Small Fruit Diseases Workers Discussion	Room 8–9, CC
7:30 a.m. – 5:30 p.m.	Registration	West Hall Lobby, CC
8:00 – 9:15 a.m.	Technical Session: Pathogen Detection	Room 16, CC
	Technical Session: Pathogen Ecology	Room 18–19, CC
8:00 – 10:15 a.m.	Take a Walk Session: Florida Wetlands, Mangroves and More.... , <i>preregistration required</i> <i>Meet at the APS registration area, group will leave promptly at 8:00 a.m.</i> <i>The Aquarium is a 15–20 minute walk from the convention center.</i>	Florida Aquarium
8:00 – 11:00 a.m.	Special Session: 16th I.E. Melhus Graduate Student Symposium	Room 22-23, CC
	Special Session: Contributions of Plant Viruses to Phytobiome Research	Room 24–25, CC
	Special Session: Disease Management in the Genomics Era	Room 15, CC
	Special Session: The Function and Mechanism of CRISPR and Its Applications	Room 20–21, CC
	Special Session: New Products and Services	Room 14, CC
	Special Session: Reviewing a Manuscript 101	Room 13, CC
8:00 – 11:00 a.m.	Academic Unit Leaders Forum Breakfast & Meeting	Room 5, Marriott
8:00 a.m. – 6:00 p.m.	Poster Viewing	West Exhibit Hall, CC
8:30 – 9:30 a.m.	Office of Public Sector Relations (OPSR) Board Meeting	Room 1, Marriott
9:45 – 11:00 a.m.	Technical Session: Bacterial Virulence Regulation	Room 16, CC
	Technical Session: Population Dynamics	Room 18–19, CC
10:00 a.m. – 5:00 p.m.	APS PRESS Bookstore	West Exhibit Hall, CC
10:00 a.m. – 6:00 p.m.	Exhibits Open	West Exhibit Hall, CC
11:15 a.m. – 12:15 p.m.	Plenary Session: Different Kinds of Minds Are Needed to Solve Problems, featuring keynote speaker Temple Grandin (<i>see page 10 for description</i>)	Ballroom BC, CC
12:15 – 1:30 p.m.	Lunch Break	
12:30 – 1:30 p.m.	APHIS Widely Prevalent Bacteria Committee Meeting, <i>by invitation</i>	Room 4, CC
12:30 – 1:30 p.m.	Sugarcane Orange Rust Meeting, <i>brown bag lunch</i>	Room 5, CC
12:30 – 2:00 p.m.	<i>Phytopathology News</i> Advisory Committee Meeting	Waterside Grill, Marriott
1:30 – 2:45 p.m.	Special Session: Balancing a Successful Career and Family	Room 16, CC
	Special Session: Translational Research for the Management of Complex Diseases	Room 15, CC
1:30 – 2:45 p.m.	Technical Session: Fungicide Resistance	Room 13, CC
	Technical Session: Host Plant Resistance	Room 18–19, CC
	Technical Session: Metagenomics and the Phytobiome	Room 22–23, CC
	Technical Session: Pathogen Diversity	Room 14, CC
1:30 – 2:45 p.m.	PhytoViews: Changing Regulations in the Face of Changing Technology (<i>see page 20 for description</i>)	Room 24–25, CC
1:30 – 2:45 p.m.	Hot Topic: Intro to Phytobiome Competitive Grants (NSF/NIFA)	Room 20–21, CC
1:30 – 5:30 p.m.	Foundation Board Meeting, <i>by invitation</i>	Room 4, Marriott
2:00 – 3:30 p.m.	Office of Education (OE) Board Meeting	Room 3, Marriott
3:00 – 4:00 p.m.	Publish in <i>Phytobiomes</i> Journal – Meet the Editor-in-Chief	West Exhibit Hall, CC
3:00 – 5:30 p.m.	Career Fair	West Exhibit Hall, CC
3:00 – 5:30 p.m.	Poster Viewing with Authors and Poster Huddles	West Exhibit Hall, CC
	3:00 – 3:30 p.m. Poster Huddles	
	HUDDLE #4 – What are the differences between natural products and synthetic pesticides for disease control in terms of development, regulation, and efficacy?	
	HUDDLE #5 – What makes an effective biocontrol agent?	
	HUDDLE #6 – What are metabolomic and other global chemical analyses teaching us about host resistance and susceptibility?	
	3:30 – 5:30 p.m. Poster Viewing with Authors	
	3:30 – 4:30 p.m. Posters 1–400 (<i>odd numbers</i>)	
	4:30 – 5:30 p.m. Posters 401–804 (<i>odd numbers</i>)	
3:30 – 5:00 p.m.	Presidential Meeting of Plant Pathology Organizations, <i>by invitation</i>	Room 2, Marriott

DAILY MEETING SCHEDULE AND SESSIONS

6:00 – 7:00 pm.	LGBTQA Social and Networking Hour, <i>Open to all meeting attendees, cash bar, no preregistration required</i>	Champions Restaurant, Marriott
6:00 – 7:30 p.m.	Diagnostics Working Group	Room 7, CC
6:00 – 8:00 p.m.	Wheat-Mite-Virus Project	Room 3, Marriott
7:00 – 9:00 p.m.	Committee for Diversity and Equality presents “#You and Diversity” Workshop, <i>preregistration required</i>	Champions Restaurant, Marriott

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 at the Florida Aquarium.

Tuesday, August 2 and repeated Wednesday, August 3

8:00 – 10:15 a.m.

Preregistration required, ticketed session.

Take a Walk Session: Florida Wetlands, Mangroves and More....

The Florida Aquarium tells the story of Florida’s water, but it also tells another story. With more than 80 plant species native to Florida, the wetlands gallery is as much native garden, aviary, and zoo as it is aquarium. Horticulture Curator Julia Stack will guide us through the wetlands gallery, discuss the history and maintaining of the botanical collection, and showcase one of the largest interior displays of mangrove forests in the world, where we will discuss the three species of the most threatened plant in the Florida environment: the red mangrove (*Rhizophora mangle*), the black mangrove (*Avicennia germinans*), and the white mangrove (*Languncularia racemosa*). Stack will also discuss her efforts in keeping the entire botanical collection chemical free. *Preregistration is required. Attendance is limited.*



Meetings take place in the Tampa CONVENTION CENTER (CC) unless otherwise noted.

■ WEDNESDAY, AUGUST 3

7:00 – 9:00 a.m.	Food Safety Interest Group	Room 2, Marriott
7:30 – 9:30 a.m.	APS Awards and Honors Committee Meeting, <i>by invitation</i>	Room 3, Marriott
7:30 a.m. – 2:00 p.m.	Registration	West Hall Lobby, CC
8:00 – 10:00 a.m.	Office of International Programs (OIP) Board Meeting	Room 1, Marriott
8:00 – 10:15 a.m.	Take a Walk Session: Florida Wetlands, Mangroves and More , <i>preregistration required</i> <i>Meet at the APS registration area, group will leave promptly at 8:00 a.m. The Aquarium is a 15–20 minute walk from the convention center.</i>	Florida Aquarium
8:00 – 11:00 a.m.	APS PRESS Bookstore	West Exhibit Hall, CC
8:30 – 10:00 a.m.	PhytoCafe featuring Poster Huddles, Idea Cafés, Exhibits, Poster Viewing with coffee, tea, and light breakfast snack provided 8:30 – 9:00 a.m. Poster Huddles <i>HUDDLE #7</i> – What are the best approaches to identifying and characterizing virulence factors from diverse pathogens? <i>HUDDLE #8</i> – What commonalities exist between host resistance and susceptibility? <i>HUDDLE #9</i> – Why the resistance? Challenges to managing fungicide resistance. 8:30 – 10:00 a.m. Poster Viewing and Exhibits 9:00 – 10:00 a.m. Idea Cafés (new day and time!) <i>(see page 24 for description)</i>	West Exhibit Hall, CC
9:30 – 10:30 a.m.	APS-CSPP Working Group Meeting, <i>by invitation</i>	Room 2, Marriott
10:00 – 11:00 a.m.	Poster Take-Down	West Exhibit Hall, CC
10:00 – 11:30 a.m.	APS 2017 Annual Meeting and 2018 ICPP Program Planning Meeting	Room 10–11, CC
10:00 a.m. – 12:00 p.m.	Exhibit Take-Down	West Exhibit Hall, CC
10:00 a.m. – 12:00 p.m.	Office of Public Relations & Outreach (OPRO) Board Meeting	Room 3, Marriott
10:15 – 11:30 a.m.	Technical Session: Bacterial Disease Management Technical Session: Biological & Cultural Disease Management Technical Session: Fungal Genomics Technical Session: Liberibacter Technical Session: Plant Resistance Hot Topic: Everything You Should Know About CRISPR	Room 15, CC Room 22–23, CC Room 20–21, CC Room 18–19, CC Room 16, CC Room 24–25, CC
10:15 – 11:30 a.m.	APS Financial Advisory Committee Meeting	Room 4, Marriott
10:30 a.m. – 12:00 p.m.	Lunch Break	
11:30 a.m. – 1:00 p.m.	APS Council Meeting	Room 4, Marriott
12:00 – 3:00 p.m.	Special Session: Fieldside Manner: Serving Plant Pathology's Stakeholders Special Session: A Multidisciplinary Approach to Combating Rose Rosette Disease: Science to Practice	Room 18–19, CC Room 16, CC
1:00 – 2:15 p.m.	Technical Session: Effector Biology Technical Session: Pathogen Dispersal	Room 20–21, CC Room 15, CC
1:00 – 4:00 p.m.	Special Session: The Impact of Vector-Borne Bacteria Pathogen on Associated Hosts Special Session: Promising Phenotyping Efforts for Understanding Genetic and Molecular Bases of Plant Disease Resistance	Room 22–23, CC Room 24–25, CC
2:45 – 4:00 p.m.	Special Session: See the Unseen: Metatranscriptomics Unveils Plant- and Vector-Pathogen Interactions	Room 16, CC
2:45 – 4:00 p.m.	Technical Session: Isothermal Pathogen Detection Technical Session: Mycotoxins	Room 20–21, CC Room 15, CC
3:00 – 5:00 p.m.	<i>PDMM</i> Task Force Meeting	Room 3, Marriott
6:30 – 9:30 p.m.	Final Night Celebration—Tampa on the Bay	Rotunda Area, CC

DAILY MEETING SCHEDULE AND SESSIONS

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 in 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.**

Wednesday, August 3

9:00 – 10:00 a.m.

- Beneficial Plant Pathogens for Biological Control of Weeds — William Bruckart, *USDA ARS FDWSRU*
- *BLIGHT!* Your Last Chance to Survive — Ana Cristina Fulladolsa, *University of Wisconsin-Madison*
- Building Opportunity for Public Engagement and Extension Experience into Graduate Programs — William Weldon, *Cornell University*
- Capturing Impacts and Emotions: Why Plant Pathology Matters — Leland Pierson III, *Texas A&M University*
- Crop Science and Technology Messages in the Facebook Era — Karasi Mills, *Ohio State University*
- Could Elevated O₃ Associated with Climate Change Affect Leaf-surface Phytobiome and the Efficacy of Biological and Chemical Control? — Al-Sayed Mashaheet, *North Carolina State University*
- Future of Bananas — André Drenth, *University of Queensland*
- Graduate School: 101 Ways to Succeed — Carolee Bull, *Penn State University*
- How can Phytobiome Projects Contribute to Increase Sensitivity and Specificity of Seed Health Testing? — Rodrigo Pedrozo, *Kansas State University*
- Improving Gender Representation within Plant Pathology — Anna Testen, *The Ohio State University OARDC*, and Elisha B. Allan, *University of Massachusetts*
- Staying Clean: Producing Disease-free Plants in Vegetatively Propagated Crops — Kelly Ivors, *Cal Poly State University*
- Sustainable Agriculture and Implications on Current Agricultural Practices — Febina Mathew, *South Dakota State University*
- Tactics for Incorporating Research into Teaching — Brantlee Spakes Richter, *University of Florida*
- Use of Technology in Teaching (e.g. 3D imaging) — Anissa Poleatewich, *Vineland Research & Innovation Center*
- Who Decides What We Mean by “Science Communication?” — Tyler McCann, *Cornell University*



SATURDAY, JULY 30, 2016

Field Trips

(listed in chronological order)

Current Status and Perspectives on Citrus Huanglongbing in the State of Florida

7:00 a.m. – 5:00 p.m.

Organizers: Julius Fajardo, USDA-Office of Pest Management Policy; Washington D.C.; Greg Hodges, Jason Stanley, Xiaohan Sun, Callie Walker, and Leroy Whilby, Florida Department of Agriculture and Consumer Services-Division of Plant Industry, Gainesville, FL U.S.A.

Sponsoring Committees: Emerging Diseases and Pathogens Committee, Vector-Pathogen Complexes Committee, Regulatory Plant Pathology Committee, Industry Committee

Financial Sponsor: Bayer CropScience

Highlighting the current status on the challenges and perspectives in the integrated management of citrus greening disease or huanglongbing (HLB) in the state of Florida since its detection in 2005, participants will interact with local, state and federal citrus health specialists, growers, processors, policymakers, and regulators including university research and extension personnel on the socio-economic impacts of HLB. Since 2006, HLB hurt the citrus industry an estimated \$3.63 billion in lost revenue and more than 6,600 jobs. Sites to visit will be research facilities at the state and federal levels such as FDACS, University of Florida-Citrus Research and Education Center, citrus grove owned by commercial grower, Florida's Natural, Hunt Brothers packinghouse, and nursery plantation.

The Greens Behind the Scenes: A Horticultural Tour of Disney World Nursery Operations and The Land Pavilion at Epcot

7:00 a.m. – 7:30 p.m.

Organizers: Pamela Roberts, University of Florida, Immokalee, FL, U.S.A.; Gary Vallad, University of Florida, Wimauma, FL, U.S.A.

Sponsoring Committee/Sponsor: Extension Committee

Participants will have a behind the scenes view of the horticultural magic that keeps Disney World green as we tour the Disney World landscape facilities and meet the landscape team to learn how the park is maintained. Participants will then enter EPCOT at Disney World and enjoy a special tour of the greenhouse and aquaponic facilities at "The Land," and enjoy lunch. The rest of the day can be spent exploring the sites and attractions at EPCOT before returning to Tampa in the evening.

From Mangrove to Pine Cone: A Look at the Current and Emerging Forest Health Issues Affecting Florida

8:00 a.m. – 5:30 p.m.

Organizer: Jason Smith, University of Florida, Gainesville, FL, U.S.A.

Sponsoring Committee/Sponsor: Forest Pathology Committee

Traveling to natural and urban forests in the Tampa Bay region, participants will observe a diverse array of tree health issues in a variety of settings, including: a coastal mangrove forest affected by sea level rise, longleaf pine ecosystem, live oaks and palms in an

urban park, redbay and other native species in a hardwood forest. This will be a unique opportunity to see important diseases and pathogens including pitch canker and Diplodia blight of pine, laurel wilt, Diplodia corticola and Phytophthora cinnamomi on oak and Texas Phoenix palm decline caused by a newly discovered phytoplasma.

Florida's Fascinating Fungal Foray

8:00 a.m. – 1:00 p.m.

Organizers: Brantlee Richter and Matt Smith, University of Florida, Gainesville, FL, U.S.A.

Sponsoring Committee/Sponsor: Mycology Committee

Late summer in Florida is the peak rainy season and mushroom hunter's paradise where we should see tremendous biodiversity of mycorrhizal, saprophytic, and pathogenic macrofungi. July typically provides a colorful array of milk caps, boletes, and Amanitas, as well as other, more subtle treasures. This foray will go to the Lower Hillsborough Wilderness Preserve and the adjoining Hillsborough River State Park, a multi-agency park area of more than 19,000 acres surrounding 13 miles of the Hillsborough River. Habitats include riverine forest, pine flatwoods, sawgrass marsh, a sphagnum bog, two sinkholes and a wood stork rookery. We will convene at the end of the foray to identify specimens and hear about local fungi and mycological history.

Workshops

(listed in chronological order)

Using the R Statistical Computing Language for Reproducible Science

8:30 – 11:30 a.m.; Salon V, Marriott Waterside Hotel

Organizers: Niklaus Grunwald, USDA ARS, Corvallis, OR, U.S.A.; Zhian Kamvar and Zach Foster, Oregon State University, Corvallis, OR, U.S.A.

Sponsoring Committee/Sponsor: Evolutionary Genetics and Genomics Committee; Epidemiology Committee

This workshop introduces the use of the R statistical computing language for reproducible science. Reproducible science means providing data, code, images, and reports in such a way that experiments can be easily repeated or at least understood in detail. The R programming language has many free tools that can be used to integrate research data, methods, and explanation in sharable forms to facilitate reproducibility. Participants will learn how to use the RStudio Desktop application, Rmarkdown, and R functions to write reports, lab notebooks and actual finished manuscripts in pdf, word or html format. We will use examples from our work published in APS journals and housed on github in this hands-on workshop. Participants are expected to bring their own laptop (Linux, PC or Mac) with RStudio, R, and certain packages preinstalled.

(continued)

Identification of Phytophthora Species Using “The Online Identification Tools: Lucid Key, Tabular Key and Sequencing Analyses”

8:30 a.m. – 12:00 p.m.; Room 13, Convention Center

Organizers: Z. Gloria Abad and John C. Bienapfl, USDA-APHIS-PPQ-S&T CPHST Beltsville Lab, Beltsville, MD, U.S.A.

Sponsoring Committee/Sponsor: Plant Pathogen and Disease Detection Committee; Diagnostics Committee

The genus *Phytophthora* contains aggressive pathogens affecting important crops, forestry and natural ecosystems around the world. This workshop will help researchers understand the taxonomy and phylogeny of *Phytophthora* and correctly identify unknown isolates to species level based on morphological and molecular characterization, using BLAST and phylogenetic analysis, with specimens of the ex-holotypes or ex-neotypes. After an overview of the contents of the resource, the participants will have the opportunity for hands-on use of the Online ID Tools developed by the instructors and international collaborators and advised by the USDA Identification Technology Program (ID Tools). This resource is the first of its kind for plant pathogens and is already posted online to be used free of charge. Participants should bring a computer to work on during the workshop demonstrations.

English Scientific Writing: Avoiding Some Common Errors

8:30 a.m. – 4:30 p.m.; Room 9, Marriott Waterside Hotel

Organizer: Robert Trigiano, University of Tennessee, Knoxville, TN, U.S.A.

Competency in written language is necessary for anyone wishing to communicate on a global scale, whether writing for academia, journalism or business. The number one reason why research/educational papers are rejected or why international employment is not offered to non-native English speakers is the lack of proficiency in written and oral English skills. This intensive workshop was developed for United States and international audiences to improve their English writing (and presentation) skills. Topics included in the workshop: research and writing ethics (plagiarism), what makes a “good” writer, word misuse, topic sentences, titles, abstract, organization of papers, figures and tables, manuscript submission, and presentations.

Bringing Advanced Diagnostic Methods to your Lab: from RT-PCR to LAMP

9:00 a.m. – 4:00 p.m.; Room 11-12, Convention Center

Organizers: Patricia de Sa Snow and Laurene Levy, USDA-APHIS; Barry Pryor, University of Arizona; Tucson, AZ, U.S.A.; Charles Hagen, Monsanto, Woodland, CA, U.S.A.

Sponsoring Committee/Sponsors: Diagnostics, Plant Pathogen and Disease Detection, Mycology, Virology

Financial Sponsor: Monsanto

This workshop will include practical presentations and demos of advanced diagnostic techniques that are lab- and field-ready to demonstrate their applicability in the diagnostics lab. Methods and challenges of RT-PCR, and high-throughput sequencing for diagnostics will be discussed. Demos and presentations of different methods and platforms for isothermal amplifications (LAMP) and of CANARY (Cellular Analysis and Notification of Antigen Risks and Yields) will be given with Q&A sessions. Although some of these techniques may seem expensive to implement, they can be cost effective, time efficient, reliable, and accurate. This workshop

will include presentations on how these advanced techniques can be quickly adopted by diagnostic laboratories nationwide and the subsequent impact and advancement of NPDN laboratory accreditation efforts.

Generalized Linear Mixed Models for Data Analysis in Plant Pathology

10:00 a.m. – 5:00 p.m.; Salon VI, Marriott Waterside Hotel

Organizers: Larry Madden, The Ohio State University, Wooster, OH, U.S.A.; Alissa Kriss, Syngenta, Greensboro, NC, U.S.A.

Sponsoring Committee/Sponsor: Epidemiology Committee

Registrants will learn to use the GLIMMIX procedure of SAS to analyze non-normal data for common problems in plant pathology. It is common to use mixed models instead of traditional ANOVA to analyze data from designed experiments and surveys. These models formally handle experiments with both fixed and random effects, and result in valid test statistics and standard errors for all the effects of interest under a wide range of circumstances. With mixed models, one can: directly and correctly analyze data from experiments with two or more sources of variation (e.g., split plots, multi-location studies); account for unequal variability (i.e., variances dependent on treatment); properly test for the effects of repeated measures (such as time during the growing season); and account for the correlation of spatially-referenced data. Linear mixed models (LMMs) have been most commonly used for analysis, which are strictly valid for continuous variables with a normal distribution. To fully handle data with a discrete distribution (such as disease incidence, lesion or spore counts) and other non-normal distributions, one must use generalized linear mixed models (GLMMs). There is compelling evidence that certain results can be biased or misleading when one uses LMMs for data that should be analyzed with GLMMs. Target of inference can be off with LMM (after transformation). Analysis using GLMMs is computationally demanding, and requires considerable care in defining the required model terms (for a given experimental and treatment design) and in interpreting output. Concepts of conditional and marginal models, of minor importance with LMMs, come to the forefront with GLMMs.

Introduction to Network Models in R

1:00 – 4:00 p.m.; Salon V, Marriott Waterside Hotel

Organizers: John Hernandez Nopsa, Ravin Poudel, and Karen Garrett, University of Florida, Gainesville, FL, U.S.A.

Sponsoring Committee/Sponsor: Epidemiology Committee

Network models are becoming an important tool in many areas of plant pathology for understanding system complexity. Participants will learn how to build and interpret network models and use the R programming environment to analyze network data in epidemiology, extension, genetics, and molecular biology. Participants will come away with an understanding of how to apply network models to address a range of questions in plant pathology, with hands on experience. As part of this workshop, a short introduction to R will be provided. Participants must bring their own laptop with the latest R version.

Make an Impact: How to Effectively Communicate your Scientific Message to the Public

1:00 – 4:00 p.m.; Salon II-III, Marriott Waterside Hotel

Organizers: Nicole Donofrio, University of Delaware, Newark, DE, U.S.A., Juliet Marshall, University of Idaho, Idaho Falls, ID, U.S.A.

Sponsoring Committee/Sponsor: Office of Public Relations & Outreach (OPRO)

This workshop will provide participants with tips and tools on how to effectively deliver scientific messages to the general public. Communication experts will share how to successfully combat scientific misinformation and convey the importance of your research and the benefits of science in a climate where funding for scientific research is at an all-time low. Whether you are tweeting about your lab's research, explaining your science to high school students, pitching an idea to an NSF program leader, or lobbying on Capitol Hill, this workshop will help you become a more effective communicator. The workshop will consist of two parts. First, Judith Humble, a Licensed Clinical Social Worker with 26 years of experience in teaching communication skills, will share techniques for overcoming resistance to change, managing negativity and establishing credibility. Then, Ruth Huhl Borger, Ed.D., APR, Assistant Vice President, and Tiffany Stephenson, Social Media Manager, both from IFAS/UF Communications, will guide you through hands-on activities, learning techniques and best practices for communicating your research in person and on social media. Through fun, participatory exercises, attendees will “translate” basic info about their work to non-scientists and learn how to communicate through tweets and Facebook posts.

Design and Analysis of Amplicon Sequencing for Targeted Multiplexed Genotyping

1:30 – 4:30 p.m.; Room 13, Convention Center

Organizer: Lance Cadle-Davidson, USDA, Geneva, NY, U.S.A.

Sponsoring Committee/Sponsor: Evolutionary Genetics and Genomics Committee

Amplicon sequencing (AmpSeq) involves highly multiplexed genotyping of known genes or loci by next-generation sequencing, at a low per-sample cost. In this lecture-style workshop, applications of AmpSeq will be discussed, including marker-assisted breeding, population genetic analysis, detecting the presence and allelic variants of candidate genes, metagenomics analysis of communities, and marker conversion from GBS, SSR, or other genotyping platforms. We will guide attendees through a series of steps in AmpSeq primer design and data analysis.



Visit the OIP Silent Auction!

NEW DAY & TIME: Monday, August 1,
from 2–6 p.m.

NEW LOCATION: Exhibit Hall

Bid on a wide variety of unique items from around the world to help raise funds for the Global Experience Program.



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.



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Demo our latest e-resources!

Monday, August 1, 10 a.m. – 3 p.m.
Tuesday, August 2, 11 a.m. – 4 p.m.

- **SEARCH** our new collection of nearly 40 online books now available for subscription
- **VIEW** our new and detailed collection of protocols for researching *Phytophthora* species
- **BROWSE** nearly 4,500 images in our new APS Image Database
- **EXPERIENCE** the new and improved *Turf MD* and *Tomato MD* apps
- **DISCOVER** the latest content from the Plant Management Network and APS Journals



Get your books personally signed!

Tuesday, August 2 from 12:15 – 1:15 p.m. in the APS PRESS Bookstore

- Judith Brown, Editor – *Vector-Mediated Transmission of Plant Pathogens*
- Prakash K. Hebbar, Co-Author – *Trichoderma: Identification and Agricultural Applications*



Purchase and get at least one of these books signed, and receive a **FREE T-SHIRT** of your choice!



Check the program book or meeting app for bookstore hours

SUNDAY AFTERNOON, JULY 31

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 www.apsnet.org/meetings/annual/scientificprogram/Pages. 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

Dispersal at Multiple Scales: A Key to Outbreak of Disease Epidemics

1:00 - 4:00 p.m.; Room 16, CC

Organizers: Peter Ojiambo, North Carolina State University, Raleigh, NC, U.S.A.; Laurence Madden, Ohio State University, Wooster, OH, U.S.A.

Section: Epidemiology

Sponsoring Committees/Sponsors: Epidemiology and Crop Loss Assessment and Risk Evaluation (CLADRE) Committees

1:00 p.m. • 1-S

Introduction: The importance of dispersal in botanical epidemics.
L. MADDEN (1), (1) Ohio State University, Wooster, OH, U.S.A.

1:30 p.m. • 2-S

Dispersal of *Pseudoperonospora cubensis*: Basis for Forecasting Cucurbit Downy Mildew Epidemics.
P. OJIAMBO (1), (1) North Carolina State University, Raleigh, NC, U.S.A.

2:00 p.m. • 3-S

Physical aspects of Dispersal of Spores of Plant Pathogens.
D. AYLOR (1), (1) Connecticut Agricultural Experiment Station, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 4-S

Simulation modeling and mitigation of climate change effects on generational migrations of a crop pest: Fall armyworm (*Spodoptera frugiperda*).
J. WESTBROOK (1), R. Nagoshi (2), R. Meagher (2), S. Fleischer (3), S. Jairam (4), (1) USDA-ARS, College Station, TX, U.S.A.; (2) USDA-ARS, Gainesville, FL, U.S.A.; (3) Pennsylvania State University, University Park, PA, U.S.A.; (4) Self-employed, Simi Valley, CA, U.S.A.

3:15 p.m. • 5-S

A physically-based theoretical model of spore deposition for predicting spread of plant diseases.
M. CHAMECKI (1), S. Isard (2), (1) University of California, Los Angeles, Los Angeles, CA, U.S.A.; (2) Penn State University, University Park, PA, U.S.A.

3:45 p.m. • Discussion

Emerging Nano Materials for Disease Management and Insights from Findings in Nano-based Diagnostics

1:00 - 4:00 p.m.; Room 24-25, CC

Organizers: Mathews Paret, University of Florida, Quincy, FL, U.S.A.; Amanda Strayer, University of Florida, Gainesville, FL, U.S.A.; Wade Elmer, The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.

Moderators: Mathews Paret and Amanda Strayer, University of Florida, Quincy, FL, U.S.A.; Wade Elmer, Connecticut Agricultural Experimental Station, New Haven, CT, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Integrated Plant Disease Management, Bacteriology, and Chemical Control Committees

1:00 p.m. • 6-S

Nano material development, industry technology and status, safety approvals for use as fungicides/bactericides.
S. SANTRA (1), S. Santra (1), (1) University of Central Florida, Orlando, FL, U.S.A.

1:30 p.m. • 7-S

Advanced copper and zinc nanomaterials for management of bacterial canker of citrus.
E. JOHNSON (1), M. Myers (2), K. Gerberich (1), S. Santra (3), J. Graham (1), (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Florida, Ft. Pierce, FL, U.S.A.; (3) University of Central Florida, Orlando, FL, U.S.A.

2:00 p.m. • 8-S

Advanced Nanomaterials for Management of Bacterial Spot of Tomato.
A. STRAYER-SCHERER (1), Y. Liao (1), I. Ocsay (2), M. Young (3), W. Tan (4), S. Santra (5), J. Jones (1), M. Paret (6), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Analytical Chemistry, Faculty of Pharmacy, Erciyes University, Kayseri, Turkey; (3) NanoScience Technology Center and Burnett School of Biomedical Science, University of Central Florida, Orlando, FL, U.S.A.; (4) Department of Chemistry, University of Florida, Gainesville, FL, U.S.A.; (5) Burnett School of Biomedical Sciences, NanoScience Technology Center and Department of Chemistry, University of Central Florida, Orlando, FL, U.S.A.; (6) Department of Plant Pathology, North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 9-S

Trophic transfer of engineered nano materials: Will the food chain be compromised?
R. DE LA TORRE-ROCHE (1), J. White (1), (1) Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.

3:15 p.m. • 10-S

Metal oxide nano materials for management of Verticillium wilt on eggplant and Fusarium wilt on watermelon.
W. ELMER (1), J. White (1), (1) The Connecticut Agricultural experiment Station, New Haven, CT, U.S.A.

3:30 p.m. • 11-S

DNA materials integrating nanotechnology and biotechnology.
D. LUO (1), (1) Cornell University, Ithaca, NY, U.S.A.

3:45 p.m. • Discussion

Novel Applications of Whole Genome Sequencing and Bioinformatics in Microbial Forensics and Agricultural Biosecurity

1:00 - 4:00 p.m.; Room 15, CC

Organizers: Jacqueline Fletcher, Oklahoma State University, Corrales, NM, U.S.A.; William Schneider, USDA ARS Foreign Diseases and Weeds Research Laboratory, Fort Detrick, MD, U.S.A.

Moderators: Jacqueline Fletcher, Oklahoma State University, Stillwater, OK, U.S.A.; James Stack, Kansas State University, Manhattan, KS, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Microbial Forensics Interest Group, Emerging Diseases and Pathogens Committee

1:00 p.m. • 12-S

Genomics-based Bioforensic Analysis at the National Bioforensic Analysis Center.
N. BERGMAN (1), (1) National Biodefense Analysis and Countermeasures Center, Fort Detrick, MD, U.S.A.

1:30 p.m. • 13-S

Harnessing WGS for Forensic Analysis: Bioinformatics Pipelines and Data.
M. COUGER (1), J. Fletcher (2), W. Schneider (3), (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) Oklahoma State University, Fremont, OK, U.S.A.; (3) USDA ARS, Fort Detrick, MD, U.S.A.

2:00 p.m. • 14-S

Metabolomics in Microbial Forensics: The example of Citrus Greening Disease in Florida.
J. REYES DE CORCUERA (1), (1) Department of Food Science & Technology, University of Georgia, Athens, GA, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 15-S

Whole genome analyses of all known populations of the Select Agent *Rathayibacter toxicus*.
J. STACK (1), M. Arif (2), G. Busot (3), R. Mann (4), S. Liu (2), B. Rodoni (5), (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Kansas State University, U.S.A.; (3) Kansas State University, U.S.A.; (4) Victoria Department of Economic Development and Primary Industries, Australia; (5) Victoria Department of Economic Development and Primary Industries, U.S.A.

3:15 p.m. • 16-S

Microbial Forensics Case Study: Applications of Forensic Technology in a Field Outbreak of Salmon Blotch of onion.
J. FLETCHER (1), J. Fletcher (2), I. Moncrief (3), U. Melcher (2), A. Gamliel (4), J. Stack (5), (1) Department of Entomology & Plant Pathology, Oklahoma State University, Stillwater, OK, U.S.A.; (2) Oklahoma State University, Stillwater, OK, U.S.A.; (3) Harry S. Truman College, Chicago, IL, U.S.A.; (4) Volcani Institute, Bet Dagen, Israel; (5) Kansas State University, Manhattan, KS, U.S.A.

3:45 p.m. • Discussion

Role of Phytobiomes in Plant Disease Control

1:00 - 4:00 p.m.; Room 22-23, CC

Organizer: Gwyn Beattie, Iowa State University, IA, U.S.A.
Moderators: Gwyn Beattie, Iowa State University, Ames, IA, U.S.A.; Jan Leach, Colorado State University, Ft. Collins, CO, U.S.A.; Kevin McCluskey, Kansas State University, Manhattan, KS, U.S.A.; and Kellye Eversole, Eversole Associates, Bethesda, MD, U.S.A.

Section: Biology and Disease Management
Sponsoring Committees/Sponsors: Public Policy Board, Collections and Germplasm Committee, Food Safety Interest Group

1:00 p.m. • 17-S

Phyllosphere fungal endophyte effects on plant disease are context-dependent.
P. BUSBY (1), G. Crutsinger (2), M. Barbour (2), G. Newcombe (3), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) UBC, Canada; (3) U Idaho, U.S.A.

1:30 p.m. • 18-S

Exploitation of microbial symbionts from prairie grasslands for crop enhancement.
K. CRAVEN (1), K. Craven (2), (1) Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.; (2) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.

2:00 p.m. • 19-S

The role of insect-associated microbes in altering host plant defenses.
C. CASTEEL (1), A. Bak (2), S. Whitham (3), (1) University of California-Davis, Davis, CA, U.S.A.; (2) University of California - Davis, U.S.A.; (3) Iowa State University, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 20-S

The role of microbial communities in the development of the immune competency of plants.
S. HE (1), (1) Michigan State University, East Lansing, MI, U.S.A.

3:15 p.m. • 21-S

Evaluation of microbials using comparative genomics and high-throughput assays as a method to reduce product development time.
S. INCH (1), J. Leder (1), A. Taylor (1), M. Frodyma (1), M. Furlan (1), M. Schulte (1), R. Berka (1), M. Maranta (1), B. Cherry (1), E. Prusinkiewicz (2), (1) Novozymes, Raleigh, NC, U.S.A.; (2) Novozymes, Canada

3:30 p.m. • 22-S

Can I use this strain? Legal issues impacting the use of microbial resources and how whole genome sequence may solve them. K. McCluskey (1), (1) Kansas state university, Manhattan, KS, U.S.A.

3:45 p.m. • Discussion

Schroth - Faces of the Future Symposium: Epidemiology and Management of Plant Diseases

1:00 - 4:00 p.m.; Room 20-21, CC

Organizers: Martha Malapi-Wight, USDA, Beltsville, MD, U.S.A.; Jagdeep Kaur, Donald Danforth Plant Science Center, St. Louis, MO, U.S.A.

Moderators: Martha Malapi-Wight, USDA, Beltsville, MD, U.S.A.; Jagdeep Kaur, Donald Danforth Plant Science Center, St. Louis, MO, U.S.A.

Section: Diseases of Plants

1:00 p.m. • 23-S

Modelling landscape-scale spread to inform plant health policy.
N. CUNNIFE (1), (1) University of Cambridge, Cambridge, United Kingdom

1:30 p.m. • 24-S

Monitoring spread of Phymatotrichopsis root rot disease in alfalfa fields using aerial imagery.
C. MATTUPALLI (1), C. Moffet (2), J. Rogers (1), C. Young (1), (1) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.; (2) USDA-ARS, Woodward, OK, U.S.A.

2:00 p.m. • 25-S

Crystal ballroom dancing for phytoepidemiological prospecting.
D. ANCO (1), (1) Clemson University, Blackville, SC, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 26-S

Integrated disease management for optimizing soybean yields and profitability.
H. MEHL (1), (1) Virginia Tech Tidewater AREC, Suffolk, VA, U.S.A.

3:15 p.m. • 27-S

Fungicide stress induces genome mutation in *Sclerotinia sclerotiorum*.
S. EVERHART (1), B. Amaradasa (1), (1) University of Nebraska, Lincoln, NE, U.S.A.

3:45 p.m. • Discussion

1:00 p.m. Technical Sessions

Viral Diseases

1:00 p.m. - 2:15 p.m.; Room 18-19, CC

Moderators: Madhu Kappagant, Washington State University, Prosser, WA, U.S.A.; Sara Thomas-Sharma, University of Wisconsin, Madison, WI, U.S.A.

1:00 p.m. • 1-O

Factors that influence the structure of Citrus tristeza virus populations.
S. HARPER (1), S. Cowell (2), W. Dawson (2), (1) Department of Plant Pathology, University of Florida, FL, U.S.A.; (2) Department of Plant Pathology, University of Florida, U.S.A.

1:15 p.m. • 2-O

Virus populations associated with Maize lethal necrosis (MLN) in East Africa.

L. STEWART (1), M. Redinbaugh (1), S. Wijeratne (2), G. Mahuku (3), C. Niblett (4), A. Kiggundu (5), G. Asea (5), A. Wangai (6), K. Willie (1), D. Massawe (7), (1) USDA-ARS Corn, Soybean and Wheat Quality Research Unit, Wooster, OH, U.S.A.; (2) Molecular and Cellular Imaging Center, The Ohio State University, Wooster, OH, U.S.A.; (3) International Institute of Tropical Agriculture (IITA), Dar es Salaam, Tanzania; (4) Venganza, Inc, Augustine, FL, U.S.A.; (5) National Agricultural Research Organization, Entebbe, Uganda; (6) Kenya Agricultural and Livestock Research Organization (KALRO), Nairobi, Kenya; (7) Plant Pathology Department, The Ohio State University, Wooster, OH, U.S.A.

1:30 p.m. • 3-O

Investigating the spread of Grapevine red blotch-associated virus. E. CIENIEWICZ (1), M. Fuchs (1), K. Perry (2), (1) Cornell University New York State Agriculture Experiment Station, Geneva, NY, U.S.A.; (2) Cornell University, Ithaca, NY, U.S.A.

1:45 p.m. • 4-O

Epidemiological insights into an emerging virus disease: *Blueberry shock virus* on cranberry.

S. THOMAS-SHARMA (1), L. Wells-Hansen (1), R. Page (1), V. Kartanos (2), E. Saalau-Rojas (3), P. McManus (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) Bayer Crop Science, Sacramento, CA, U.S.A.; (3) UMass Cranberry Station, E. Wareham, MA, U.S.A.

2:00 p.m. • 5-O

Threat to control Canna Yellow Streak Virus; altered infectivity by associating with a Sub-viral element of novel Canna Yellow Mottle Virus.

D. WIJAYASEKARA (1), P. Hoyt (1), B. Dunn (1), A. Gimondo (1), J. Verchot (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.

2:45 p.m. Technical Sessions

Latest in Fungicides

2:45 - 4:00 p.m.; Room 18-19, CC

Moderator: Roshni Kharadi, Michigan State University, Lansing, MI, U.S.A.

2:45 p.m. • 6-O

Trivapro™ fungicide, a new fungicide for broad spectrum control of diseases of corn, soybeans, and wheat.

E. TEDFORD (1), E. Tedford (1), A. Tally (1), (1) Syngenta, U.S.A.

3:00 p.m. • 7-O

ADEPIDYNTM: A new broad-spectrum carboxamide fungicide.

T. HARP (1), C. Nuninger (2), A. Tally (1), (1) Syngenta Crop Protection, Greensboro, NC, U.S.A.; (2) Syngenta Crop Protection, Basel, Switzerland

3:15 p.m. • 8-O

Evaluation of fungicides for management of Fusarium wilt of watermelon.

N. MILLER (1), M. Adams (1), L. Quesada-Ocampo (1) (1) North Carolina State University, U.S.A.

3:30 p.m. • 9-O

Pimaricin: A new post-harvest fungicide for selected citrus, stone, and pome fruits.

D. CHEN (1), H. Förster (1), J. Adaskaveg (1), (1) Department of Plant Pathology and Microbiology, University of California, Riverside, CA, U.S.A.

3:45 p.m. • 10-O

Evaluation of new fungicides for management of Phytophthora root rot of citrus.

W. Hao (1), M. Gray (1), H. Förster (1), J. Adaskaveg (1), (1) University of California, Riverside, Riverside, CA, U.S.A.

MONDAY MORNING, AUGUST 1

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 www.apsnet.org/meetings/annual/scientificprogram/Pages. 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

The Future of Florida Citrus

10:15 – 11:30 a.m., Room 20-21, CC

Organizer: Mary E. Palm, USDA Animal and Plant Health Inspection Service, Riverdale, MD, U.S.A.

Moderator: Laurene Levy, USDA APHIS, Plant Protection and Quarantine, Riverdale, MD, U.S.A.

Citrus diseases and pests have led to at least 40% higher grower production costs in Florida. Huanglongbing (HLB, citrus greening) poses a particular threat because there is no cure, sufficient resistant or tolerant rootstock is not yet commercially available, and costs of managing the psyllid vector are high. What will the Florida citrus industry look like in the next 5-10 years? What steps are necessary for the industry to survive? Come listen to perspectives from researchers and industry “in the trenches” and join in the discussion.

Panelists:

Tim Gottwald, USDA Agricultural Research Service, Ft. Pierce, FL, U.S.A.

Jim Graham, Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.

Peter McClure, Double K Groves, Inc., Vergo Beach, FL, U.S.A.
Pete Timmer, Citrus Research and Education Center, Lake Alfred, FL, U.S.A. (retired)

Special Sessions

Plant Pathologists of the Future

10:15 - 11:45 a.m.; Room 16, CC

Organizer: Ronald French-Monar, Texas A&M AgriLife Extension Service, Amarillo, TX U.S.A.; Lawrence Datnoff, Louisiana State University, Baton Rouge, LA, U.S.A.

Moderators: Ronald French-Monar, Texas A&M AgriLife Extension Service, Amarillo, TX U.S.A.; Lawrence Datnoff, Louisiana State University, Baton Rouge, LA, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committees/Sponsors: APS Divisional Forum, APS Divisions

10:15 a.m. • 28-S

Physiological races and genetic diversity of isolates of

Phytophthora capsici from Mexican crop production fields.

A. CASTRO ROCHA (1), P. Osuna Avila (2), S. Shrestha (3), R. Lyon (4), G. Rodríguez Alvarado (5), S. Fernández Pavia (5), K. Lamour (3), (1) Universidad Autónoma de Ciudad Juárez, Juárez, Chihuahua, Mexico; (2) Universidad Autónoma de Ciudad Juárez, Juárez, Mexico; (3) University of Tennessee, Knoxville, TN, U.S.A.; (4) Colorado State University, CO, U.S.A.; (5) Universidad Michoacana de San Nicolás de Hidalgo, Mexico

10:30 a.m. • 29-S

Identification of *Helianthus* accessions resistant to *Plasmopara halstedii* (downy mildew) and *Puccinia helianthi* (rust).

R. HUMANN (1), T. Gulya (2), M. Acevedo (3), L. Marek (4), J. Jordahl (3), S. Meyer (3), S. Markell (3), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) USDA-ARS Sunflower Research Unit (retired), U.S.A.; (3) North Dakota State University, U.S.A.; (4) USDA-ARS North Central Regional Plant Introduction Station, U.S.A.

10:45 a.m. • 30-S

Tetracycline resistance genes in epiphytic bacteria collected from Pennsylvania stone fruit orchards.

S. BARDSLEY CAPASSO (1), K. Peter (2), H. Ngugi (3), M. Jimenez Gasco (1), (1) The Pennsylvania State University, University Park, PA, U.S.A.; (2) The Pennsylvania State University, Biglerville, PA, U.S.A.; (3) Dupont, U.S.A.

11:00 a.m. • 31-S

Searching for genomic signatures of host jumping onto raspberry and strawberry in two *Phytophthora* sister taxa.

J. TABIMA (1), B. Kronmiller (2), B. Knaus (3), C. Press (4), I. Zasada (4), B. Tyler (2), N. Grünwald (4), D. Shen (5), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) Oregon State University, U.S.A.; (3) USDA ARS, Corvallis, OR, U.S.A.; (4) USDA ARS, U.S.A.; (5) Nanjing Agricultural University, China

11:15 a.m. • 32-S

Two symptoms of *Cercospora* Leaf Blight of soybean suggests two diseases caused by the same pathogen.

E. CHAGAS FERREIRA DA SILVA (1), T. Garcia (2), A. Chanda (3), C. Robertson (2), Lygin (5), R. Schneider (2), (1) Louisiana State Univ, Agricultural Center, Baton Rouge, LA, U.S.A.; (2) Louisiana State Univ, Agricultural Center, U.S.A.; (3) Department of Plant Pathology, University of Minnesota, U.S.A.; (4) Louisiana State Univ, Agricultural Center, LA, U.S.A.; (5) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.

11:30 a.m. • 33-S

Two symptoms of *Cercospora* Leaf Blight of soybean suggests two diseases caused by the same pathogen.

E. CHAGAS FERREIRA DA SILVA (1), T. Garcia (2), A. Chanda (3), C. Robertson (2), Lygin (5), R. Schneider (2) (1) Louisiana State Univ, Agricultural Center, U.S.A.; (2) Louisiana State Univ, Agricultural Center, U.S.A.; (3) Department of Plant Pathology

Shovel-ready Trees: Novel Strategies for Development of Disease Resistant Woody Plants

10:15 - 11:30 a.m.; Room 24-25, CC Livestream Session

Organizers: Jason Smith, University of Florida, Gainesville, FL, U.S.A.; Denita Hadziabdic Guerry, University of Tennessee, Knoxville, TN, U.S.A.; Jane Stewart, Colorado State University, Fort Collins, CO, U.S.A.

Section: Molecular and Cellular Plant Microbe Interactions
Sponsoring Committees/Sponsors: Forest Pathology Committee, Ornamentals/Nursery Diseases

10:15 a.m. • 34-S

Shovel-ready trees: Forest Health Initiative a model for rapid development and deployment of disease resistant trees.

C. NELSON (1), C. Nelson (2), W. Powell (3), S. Merkle (4), J. Carlson (5), M. Staton (6), C. Nairn (7), J. Holliday (8), J. Westbrook (9), L. Georgi (9), F. Hebard (9), T. Zhebentyayeva (10), S. Jeffers (10), P. Sisco (9), J. James (11), A. Abbott (12), (1) USDA-Forest Service, Southern Research Station, Saucier, MS, U.S.A.; (10) Clemson University, U.S.A.; (11) Chestnut Return Farm, Canada; (12) University of Kentucky, U.S.A.; (2) USDA Forest Service, Saucier, MS, U.S.A.; (3) State University of New York, U.S.A.; (4) University of Georgia, U.S.A.; (5) Penn State University, U.S.A.; (6) University of Tennessee, Canada; (7) University of Georgia, U.S.A.; (8) Virginia Tech, U.S.A.; (9) The American Chestnut Foundation, U.S.A.

10:30 a.m. • 35-S

Marker assisted selection opportunities for rust and necrotroph resistance in southern pines.

J. DAVIS (1), (1) University of Florida, Gainesville, FL, U.S.A.

10:45 a.m. • 36-S

Confronting emerging pathogens: A genomics empowered approach to protecting forest health.

J. LEBOLDUS (1), (1) Oregon State University, Corvallis, OR, U.S.A.

11:00 a.m. • 37-S

Fourier-transform infrared spectroscopy for the rapid identification of disease resistant trees.

C. VILLARI (1), P. Bonello (2), R. Snieszko (3), L. Rodriguez-Saona (4), (1) The Ohio State University - University of Gerogia, Columbus, OH, U.S.A.; (2) Department of Plant Pathology, The Ohio State University, U.S.A.; (3) USDA Forest Service, U.S.A.; (4) Department of Food Science and Technology, The Ohio State University, U.S.A.

11:15 a.m. • 38-S

Rapid selection and opportunities for restoration of laurel wilt tolerant *Persea* species.

J. SMITH (1), M. Hughes (2), B. Held (3), R. Blanchette (3), T. Dreaden (4), R. Ploetz (2), (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, U.S.A.; (3) University of Minnesota, U.S.A.; (4) USDA-Forest Service, Southern Research Station, U.S.A.

Technical Sessions

Fungal Disease

10:15 a.m. - 11:30 a.m.; Room 15, CC

Moderators: Adrian Zuniga, University of Florida, Wimauma, FL, U.S.A.; Alyssa Burkhardt, USDA, Capitola, CA, U.S.A.

10:15 a.m. • 11-O

Improving genomic resources for the detection of *Macrophomina phaseolina* infection of strawberry.

A. BURKHARDT (1), K. Childs (2), M. Ramon (1), F. Martin (1), (1) USDA, Salinas, CA, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.

10:30 a.m. • 12-O

Identifying sources of inoculum and timing of tissue infection by fungal pathogens associated with winterberry fruit rot.

F. PEDUTO HAND (1), S. Lin (1), N. Taylor (1), (1) The Ohio State University, Columbus, OH, U.S.A.

10:45 a.m. • 13-O

Occurrence of foliar diseases of watermelon on commercial farms in South Carolina in 2015.

G. RENNBERGER (1), A. Keinath (1), P. Gerard (2), (1) Coastal Research and Education Center, Clemson University, Charleston, SC, U.S.A.; (2) Department of Mathematical Sciences, Clemson University, Clemson, SC, U.S.A.

11:00 a.m. • 14-O

Worldwide distribution of the sweet potato strains of *Ceratocystis fimbriata*.

Q. LI (1), T. Harrington (2), J. Li (3), (1) China Agricultural University/Postdoctoral Fellows Workstation of Haidian Science Park, Beijing, China; (2) Iowa State University, Ames, IA, U.S.A.; (3) China Agricultural University, Beijing, China

11:15 a.m. • 15-O

Fungi associated with cankers and wounds of cultivated and wild olives in the Western Cape, South Africa.

C. SPIES (1), W. van Jaarsveld (2), P. Moyo (3), L. Mostert (2), F. Halleen (4), (1) ARC Infruitec-Niervoorbij, Stellenbosch, South Africa; (2) Stellenbosch University, Stellenbosch, South Africa; (3) Stellenbosch University, South Africa; (4) ARC Infruitec-Niervoorbij, Stellenbosch, South Africa

Nematodes

10:15 - 11:30 a.m.; Room 14, CC

Moderators: Krystal Navarro, The Ohio State University, Wooster, OH, U.S.A.; Gregory Tylka, Iowa State University, Ames, IA, U.S.A.

10:15 a.m. • 16-O

Multiple mechanisms of nematode control conferred by seed and root applications of microbial biocontrol agents, *Trichoderma* and *Bacillus*.

M. CADLE-DAVIDSON (1), G. Harman (1), R. Hendriks (2), W. Nosir (1), (1) Advanced Biological Marketing, Inc, Geneva, NY, U.S.A.; (2) Advanced Biological Marketing, Inc South Africa Division, Lichtenburg, Other, South Africa

10:30 a.m. • 17-O

Enhanced nematicidal activity of abamectin via nanoparticle formulation.

R. GUENTHER (1), C. Opperman (1), J. Zhu (1), D. Lindbo (2), J. Kerns (1), S. Lommel (1), T. Sit (1), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) USDA-Natural Resources Conservation Service, Raleigh, NC, U.S.A.

10:45 a.m. • 18-O

Interaction between *Fusarium* and soybean cyst nematode on soybean.

P. OKELLO (1), A. Adhikari (1), A. Varenhorst (1), S. Osborne (2), E. Byamukama (1), F. Mathew (1), (1) South Dakota State University, Brookings, SD, U.S.A.; (2) USDA-ARS, Brookings, SD, U.S.A.

11:00 a.m. • 19-O

Effect of Seed Treatments on Root-Knot Management for Soybean and Cotton.

W. ALJAAFRI (1), W. Aljaafri (1), G. Lawrence (1), V. Klink (1), (1) Mississippi State University, Starkville, MS, U.S.A.

11:15 a.m. • 20-O

Adaptation of soybean cyst nematode populations to the PI 88788 source of resistance from 2000 through 2015 in Iowa and the effects on soybean yields.

M. MCCARVILLE (1), C. Marett (2), M. Mullaney (2), G. Gebhart (2), G. Tylka (2), (1) Bayer CropScience, Omaha, NE, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.

Risk Assessment

10:15 - 11:30 a.m.; Room 18-19, CC

Moderators: Jaime Willbur, University of Wisconsin, Madison, WI, U.S.A.; Odile Carisse, Agric & Agri-Food Canada, St-Jean-sur-Richelieu, QC, Canada

10:15 a.m. • 21-O

Spatio-temporal analysis of rice blast incidence in China.

F. GUO (1), M. Lu (2), B. Wu (1), F. Guo (1), (1) China Agricultural University, China; (2) National Agro-tech Extension and Service Center, China

10:30 a.m. • 22-O

Association between temperature sensitivity and virulence of *Blumeria graminis* f. sp. *tritici*.

Y. ZHOU (1), L. Han (1), Y. Zou (1), X. Duan (1), J. Fan (1), (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, China

10:45 a.m. • 23-O

Spatio-temporal aspects of rust and nutrition of coffee plants in different irrigation systems.

M. SILVA (1), M. Silva (1), E. Pozza (2), G. Vasco (2), P. Paula (2), E. Chaves (2), G. Dornelas (2), M. Silva (2), A. Pozza (2), (1) UFLA, Lavras, Brazil; (2) Lavras Federal University, UFLA, Brazil

11:00 a.m. • 24-O

Validation and refinement of a predictive model for *Sclerotinia sclerotiorum* apothecial development in soybean fields.

J. WILLBUR (1), H. Lucas (2), B. Mueller (2), S. Chapman (2), M. Kabbage (2), D. Smith (2), (1) University of Wisconsin - Madison, Madison, WI, U.S.A.; (2) University of Wisconsin - Madison, U.S.A.

11:15 a.m. • 25-O

Weather-based risk assessment models for common leaf spot and black seed disease of strawberry caused by *Mycosphaerella fragariae*.

O. CARISSE (1), (1) Agriculture and AgriFood Canada, St-Jean-sur-Richelieu, QC, Canada

Thank You Sustaining Associate Members



APS is truly appreciative of the continued support and involvement from its Sustaining Associate Members. Progress within plant health is achieved when all sectors of science work as a team to create solutions and build relationships to advance the science of plant pathology. Thank you to the following companies for their tremendous support as APS Sustaining Associates:

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- Dow AgroSciences LLC
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Scientific Sessions
Monday

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MONDAY AFTERNOON, AUGUST 1

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 www.apsnet.org/meetings/annualscientificprogram/Pages. 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

Pest Permitting in the Phytobiome Age

1:00 – 2:15 p.m., Room 20-21

Organizer: Mary E. Palm, USDA Animal and Plant Health Inspection Service, Riverdale, MD, U.S.A.

Moderator: Kathryn Kromroy, Minnesota Department of Agriculture, St. Paul, MN, U.S.A.

Research on the phytobiome and tools developed as a result of that research often intersect with federal and state pest permitting requirements. In this interactive session you will find out when you need to apply for a pest permit and hear from researchers with experience in the connection between phytobiome research and pest permitting. Just as importantly, you can contribute to the discussion about future permitting challenges so that all parties have communicated and are prepared when those needs arise. This is a unique opportunity to identify challenges and consider solutions proactively.

Panelists:

Jorge Abad, USDA Animal and Plant Health Inspection Service, Beltsville, MD, U.S.A.

Caroline Roper, Department of Plant Pathology and Microbiology, University of California, Riverside, CA, U.S.A.

Steve Ronyak, AgBiome, Research Triangle Park, Durham, NC, U.S.A.

Special Sessions

The Phytobiome: A New Frontier in Turfgrass Disease

1:00 - 2:15 p.m.; Room 24-25, CC *Livestream Session*

Organizers: Young-Ki Jo, Texas A&M University, College Station, TX, U.S.A.; Paul Koch, University of Wisconsin, Madison, WI, U.S.A.; Jo Anne Crouch, USDA-ARS, Beltsville, MD, U.S.A.

Moderator: Paul Koch, University of Wisconsin, Madison, WI, U.S.A.

Section: Molecular and Cellular Plant Microbe Interactions

Sponsoring Committees/Sponsors: Turfgrass Pathology and Emerging Diseases and Pathogens Committees

Financial Sponsor: Syngenta Professional Products

1:00 p.m. • 39-S

Perfect harmony: Improving our understanding of microbial relationships in the turfgrass community.

J. ROBERTS (1), J. Crouch (2), Z. Carter (3), (1) University of Maryland, College Park, MD, U.S.A.; (2) USDA-ARS, Beltsville, MD, U.S.A.; (3) Eleanor Roosevelt High School, Greenbelt, MD, U.S.A.

1:15 p.m. • 40-S

Impacts of turf management practices on the soil microbiome.

J. CROUCH (1), C. Schmid (2), J. Hempfling (3), J. Murphy (2), B. Clarke (2), L. Beirn (2), (1) USDA-ARS, U.S.A.; (2) Rutgers University, U.S.A.; (3) Rutgers University, Canada

1:30 p.m. • 41-S

Is organic golf course management a hole in one?: Using microbial analysis to evaluate the turf phytobiome under different management strategies.

E. ALLAN-PERKINS (1), D. Manter (2), G. Jung (3), (1) University of Massachusetts, Amherst, MA, U.S.A.; (2) USDA ARS, Fort Collins, CO, U.S.A.; (3) University of Massachusetts Amherst, Amherst, MA, U.S.A.

1:45 p.m. • 42-S

Microbiome under Turfgrass: Diversity, Abundance and Ecological Functions.

W. SHI (1), W. Shi (1), (1) North Carolina State University, Raleigh, NC, U.S.A.

Preparing for Careers in Industry

1:00 - 2:15 p.m.; Room 16, CC

Organizer: Leah Granke, Dow AgroSciences, Hilliard, OH, U.S.A.

Moderator: Leah Granke, Dow AgroSciences, Hilliard, OH, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committees/Sponsors: Industry Committee

1:00 p.m. • 43-S

Private sector career paths with insights for preparation.

D. MCDUFFEE (1), (1) Valent USA Corporation, Indianapolis, IN, U.S.A.

1:15 p.m. • 44-S

Developing soft skills? What is the Private Sector looking for?

C. GALLUP (1), C. Gallup (1), (1) Dow AgroSciences, Indianapolis, IN, U.S.A.

1:30 p.m. • 45-S

Technical skills relevant for industry positions: Your research project & beyond.

R. GOSWAMI (1), R. Goswami (2), (1) Delaware State University, Newark, DE, U.S.A.; (2) Delaware State University, Dover, DE, U.S.A.

1:45 p.m. • 46-S

How to ace an industry interview.

E. TEDFORD (1), E. Tedford (2), (1) Syngenta, Greensboro, NC, U.S.A.; (2) Syngenta, U.S.A.

2:00 p.m. • 47-S

Navigating the job offer.

E. OYARZABAL (1), E. Oyarzabal (1), (1) Monsanto, Chesterfield, MO, U.S.A.

When Science and Politics Collide: The Good, The Bad and The Ugly

1:00 - 2:15 p.m.; Room 15, CC

Organizers: Nancy Osterbauer, Oregon Department of Agriculture, Salem, OR, U.S.A.; Kathleen Kosta, California Department of Food & Agriculture, Sacramento, CA, U.S.A.

Moderators: Nancy Osterbauer, Oregon Department of Agriculture, Salem, OR; Kathleen Kosta, California Dept of Food & Agriculture, Sacramento, CA, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Regulatory Plant Pathology, Seed Pathology, and Diagnostics Committees

1:00 p.m. • 48-S

The Road to Perdition: The process from detection of exotic pests to regulatory action.

C. MAROON-LANGO (1), E. Podleckis (1), (1) USDA APHIS PPO, Riverdale, MD, U.S.A.

1:15 p.m. • 49-S

Impact on industry's imports and exports of a pest being listed.
S. THOMAS (1), (1) Monsanto, Woodland, CA, U.S.A.

1:30 p.m. • 50-S

Conducting research on strictly regulated quarantine pathogens and diseases - Huanglongbing, citrus canker, and citrus black spot.
T. SCHUBERT (1), (1) Florida Department of Agriculture and Consumer Services-Division Of Plant Industry, Gainesville, FL, U.S.A.

1:45 p.m. • 51-S

The plant regulatory challenges caused by improved diagnostic techniques combined with globalization.
D. GOLINO (1), (1) University of California, Davis, CA, U.S.A.

2:00 p.m. • Discussion**Technical Sessions****Fungal Pathogenicity****1:00 - 2:15 p.m.; Room 14, CC**

Moderators: Yueying Chen, Penn State University, State College, PA, U.S.A.; Marcio Zaccaron, University of Arkansas, Fayetteville, AR, U.S.A.

1:00 p.m. • 26-O

Genetics behind avirulence: identification of novel avr-genes in *Magnaporthe oryzae*.
D. TATE (1), J. Hu (1), V. Ganeshan (1), T. Mitchell (1), (1) The Ohio State University, Columbus, OH, U.S.A.

1:15 p.m. • 27-O

Magnaporthe oryzae zinc finger effector1 exploits rice HIRA/AS1/AS2 complex to alter plant development and increase disease susceptibility.
Y. CHEN (1), W. Liu (2), Q. Wang (3), Y. Yang (2), (1) Penn State University, STATE COLLEGE, PA, U.S.A.; (2) Penn State University, university park, PA, U.S.A.; (3) Penn State University, University Park, PA, U.S.A.

1:30 p.m. • 28-O

Comparative Genomics of Two *Magnaporthe oryzae* Field Isolates Uncovers Novel Candidate Effector Genes.
J. HUANG (1), J. Huang (1), Y. Hong (1), L. Xu (1), M. Chen (1), Z. Zhong (1), X. Chen (1), H. Zheng (1), J. Bao (1), Z. Wang (1), (1) Fujian-Taiwan Joint Center for Ecological Control of Crop Pests, Fujian Agriculture and Forestry University, Fuzhou, China

1:45 p.m. • 29-O

Molecular dissection of a complex gene locus conferring high virulence on barley cv. Bowman in the fungal cereal pathogen *Cochliobolus sativus*.
S. ZHONG (1), Y. Leng (1), (1) North Dakota State University, Fargo, ND, U.S.A.

2:00 p.m. • 30-O

A forward genetic screen in *Phomopsis longicolla* provides unique insights into pathogenesis.
M. ZACCARON (1), S. Sharma (2), W. Fagundes (2), W. Hawkins (2), N. Lawson (2), J. Ridenour (2), J. Smith (2), B. Dhillon (2), J. Rupe (2), B. Bluhm (2), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Arkansas, U.S.A.

Oomycete Biology**1:00 - 2:15 p.m.; Room 22-23, CC**

Moderators: Michelle Marks, University of Wisconsin, Madison, WI, U.S.A.; Liliana Cano, University of Florida, Gainesville, FL, U.S.A.

1:00 p.m. • 31-O

Oomycete species richness in cacao soil assessed by massive amplicon sequencing of the cytochrome oxidase II gene.
M. RATTI (1), E. Goss (1), J. Cevallos-Cevallos (2), C. Arias (2), (1) Plant Pathology Department, University of Florida, Gainesville, FL, U.S.A.; (2) Centro de Investigaciones Biotecnológicas del Ecuador CIBE-ESPOL, Guayaquil, Ecuador

1:15 p.m. • 32-O

Genome sequence and effector repertoire of the hop downy mildew pathogen *Pseudoperonospora humuli*.
L. CANO (1), M. Bowman (2), S. Withers (3), D. Gent (4), K. Childs (5), L. Quesada-Ocampo (3), (1) University of Florida, Fort Pierce, FL, U.S.A.; (2) Van Andel Research Institute, Grand Rapids, MI, U.S.A.; (3) North Carolina State University, Raleigh, NC, U.S.A.; (4) Oregon State University, Corvallis, OR, U.S.A.; (5) Michigan State University, East Lansing, MI, U.S.A.

1:30 p.m. • 33-O

What is a clone? Rethinking the ancestry of US clonal lineages of *Phytophthora infestans* using whole genome sequences.
B. KNAUS (1), J. Tabima (2), Z. Kamvar (2), C. Davis (3), H. Judelson (3), N. Grünwald (1), (1) USDA ARS, Horticultural Crops Research Laboratory, Corvallis, OR, U.S.A.; (2) Oregon State University, Botany and Plant Pathology, Corvallis, OR, U.S.A.; (3) Univ. California, Plant Pathology, Riverside, CA, U.S.A.

1:45 p.m. • 34-O

Temperature and light effects on germination of *Peronospora effusa*.
R. CHOUDHURY (1), S. Koike (2), N. McRoberts (1), (1) University of California, Davis, CA, U.S.A.; (2) UCCE Monterey County, Salinas, CA, U.S.A.

2:00 p.m. • 35-O

Effect of red light on morphology of *Peronospora belbahrii* sporangia.
J. PATEL (1), S. Zhang (1), (1) Tropical Research and Education Center, University of Florida, Homestead, FL, U.S.A.

Virus-Host Interactions**1:00 - 2:30 p.m.; Room 18-19, CC**

Moderators: Haley McCown, University of California, Davis, CA, U.S.A.; Shaonpius Mondal, Cornell University, Ithaca, NY, U.S.A.

1:00 p.m. • 36-O

Bean common mosaic virus isolate overcomes the *bc-3* resistance allele in common bean: virus genetic determinants defining a novel pathogenicity group.
X. FENG (1), J. Myers (2), A. Karasev (1), (1) University of Idaho, Moscow, ID, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.

1:15 p.m. • 37-O

Determination and characterization of a symptom determinant of *Grapevine fanleaf virus*.
L. OSTERBAAN (1), L. Osterbaan (1), M. Fuchs (1), (1) Section of Plant Pathology and Plant-Microbe Biology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY, U.S.A.

1:30 p.m. • 38-O

Understanding superinfection exclusion by complex populations of *Citrus tristeza virus*.
S. KANG (1), M. Bergua (1), S. Folimonova (1), (1) University of Florida, U.S.A.

1:45 p.m. • 39-O

Potato virus Y strains co-localize and compete in single epidermal leaf cells.
S. MONDAL (1), S. Mondal (1), S. Gray (1), M. Ghanim (2), (1) Cornell University, Ithaca, NY, U.S.A.; (2) Volcani Center, Bet Dagan, Israel

2:00 p.m. • 40-O

Ethylene inhibition can prevent aphid attraction and Potato Virus Y spread.
A. BAK (1), S. Chen (2), T. Antichera (2), L. Perilla (2), C. Casteel (2), (1) UC Davis, Davis, CA, U.S.A.; (2) UC Davis, U.S.A.

2:15 p.m. • 125-O

Phylogeny of geminivirus coat protein sequences and dPCR aid in identifying *Spissistilus festinus* as a vector of grapevine red blotch-associated virus.
B. BAHDER (1), M. Sudarshana (2), F. Zalom (1), M. Jayanth (1) (1) University of California, U.S.A.; (2) USDA-ARS, U.S.A.

TUESDAY MORNING, AUGUST 2

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 www.apsnet.org/meetings/annual/scientificprogram/Pages. 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

16th I.E. Melhus Graduate Student Symposium - Microbial Friends and Foes: How Bacteria Help Plants Succeed and Vice-Versa

8:00 - 11:00 a.m.; Room 22-23, CC

Organizer: Caitlyn Allen

Moderators: Frank Louws, NCSU/Cip.m., Raleigh, NC, U.S.A. and Caroline Roper, University of California, Riverside, CA, U.S.A.

Section: Biology and Disease Management

Sponsoring Committee: USDA APHIS Widely Prevalent Bacteriology Committee

Financial Sponsors: Monsanto Company, APS Foundation

8:00 a.m. • 52-S

A novel transporter and a protein translation component are necessary for fire blight disease development.

S. KLEE (1), I. Mostafa (2), S. Chen (2), T. McNellis (1), (1) Penn State University, State College, PA, U.S.A.; (2) Department of Biology, University of Florida, Gainesville, FL, U.S.A.

8:30 a.m. • 53-S

Complete genome sequences of *Xanthomonas axonopodis* pv. *phaseoli* and *X. fuscans* subsp. *fuscans* generated by long-read sequence technology.

M. O'LEARY (1), G. Coaker (1), R. Gilbertson (1), (1) University of California, Davis, Davis, CA, U.S.A.

9:00 a.m. • 54-S

O antigen functions as a shield during the *Xylella fastidiosa*-grapevine interaction.

J. RAPICAVOLI (1), (1) University of California, Riverside, CA, U.S.A.

9:30 a.m. • Break

9:45 a.m. • 55-S

Regulation of denitrification in *R. solanacearum*.

A. TRUCHON (1), B. Dalsing (1), C. Allen (1), (1) University of Wisconsin Madison, Madison, WI, U.S.A.

10:15 a.m. • 56-S

Evolution of plant pathogenicity in *Streptomyces*.

Y. ZHANG (1), D. Bignell (2), R. Zuo (3), Q. Fan (4), J. Huguet-Tapia (1), Y. Ding (3), R. Loria (1), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Biology, Memorial University of Newfoundland, Canada; (3) Department of Medicinal Chemistry, University of Florida, Gainesville, FL, U.S.A.; (4) College of Plant Protection, Fujian Agriculture and Forestry University, China

10:45 a.m. • Discussion

Contributions of Plant Viruses to Phytobiome Research

8:00 - 11:00 a.m.; Room 24-25, CC **Livestream Session**

Organizers: James Schoelz, University of Missouri, Columbia, MO, U.S.A. and Lucy Stewart, USDA-ARS, Wooster, Ohio, U.S.A.

Moderators: James Schoelz, University of Missouri, Columbia, MO, U.S.A. and Lucy Stewart, USDA-ARS, Wooster, Ohio, U.S.A.

Section: Molecular and Cellular Plant Microbe Interactions

Sponsoring Committees/Sponsors: Virology Committee

8:00 a.m. • 57-S

Viruses in nature: Persistent plant viruses.

R. VALVERDE (1), (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.

8:30 a.m. • 58-S

Players in the phytobiome: vector-borne viruses and their interactions with insect hosts.

A. WHITFIELD (1), D. Rotenberg (1), (1) Kansas State University, Manhattan, KS, U.S.A.

9:00 a.m. • 59-S

Characterization of diverse virus populations associated with plant-pathogenic nematodes.

S. BEKAL (1), K. Lambert (1), G. Tylka (2), K. Bhalerao (1), (1) University of Illinois, Urbana, IL, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.

9:30 a.m. • Break

9:45 a.m. • 60-S

Virus-induced changes in grass systems biology.

K. MANDADI (1), K. Scholthof (2), (1) Texas A&M AgriLife Research, Weslaco, TX, U.S.A.; (2) Texas A&M University, U.S.A.

10:15 a.m. • 61-S

Plant-virus protein interaction and localization maps: Where's the game and who's on the team? M. GOODIN (1), (1) University of Kentucky, Lexington, KY, U.S.A.

10:45 a.m. • 62-S

Summary-The role of viruses in the phytobiome.

J. SCHOELZ (1), (1) University of Missouri, Columbia, MO, U.S.A.

Disease Management in the Genomics Era

8:00 a.m. - 11:00 a.m.; Room 15, CC

Organizers: Giovanna Danies, Universidad de los Andes, Bogotá, Colombia; Javier Tabima, Oregon State University, Corvallis, OR, U.S.A.; Lance Cadle-Davidson, USDA ARS, Geneva, NY, U.S.A.; Stephen Goodwin, Purdue University, West Lafayette, IL, U.S.A.; Steven J. Klosterman, USDA ARS, Salinas, CA, U.S.A.; Ana

Bocsanczy, University of Florida, Gainesville, FL, U.S.A.; Silvia Restrepo, Universidad de los Andes, Bogotá, Colombia

Moderators: Giovanna Danies, Universidad de los Andes, Bogotá, Colombia; Javier F. Tabima, Oregon State University, Corvallis, Oregon, United States

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Evolutionary Genetics and Genomics, Mycology, and Integrative Plant Disease Management Committees

8:00 a.m. • 63-S

Use of sequencing technologies in controlling downy mildew of lima bean.

T. MHORA (1), (1) University of Delaware, Newark, DE, U.S.A.

8:30 a.m. • 64-S

Comparative genomics of downy mildews.

R. MICHELMORE (1), C. Tsuchida (2), J. Gill (3), K. Wood (3), L. Derevnina (3), S. Reyes Chin Wo (3), K. Fletcher (3), (1) UC Davis, Davis, CA, U.S.A.; (2) UC Davis, U.S.A.; (3) UC Davis, U.S.A.

9:00 a.m. • 65-S

Application of metagenomics for virus disease management in perennial crops: A Case Study of Grapevine red blotch disease in North America.
M. SUDARSHANA (1), (1) USDA ARS, Davis, CA, U.S.A.

9:30 a.m. • Break

9:45 a.m. • 66-S

Development of citrus canker resistant varieties by manipulation of CsLOB1, the citrus susceptibility gene to *Xanthomonas citri*, using Cas9/sgRNA.
B. VINATZER (1) (1) Virginia Tech, U.S.A.

10:15 a.m. • 67-S

Integrating GBS, RNA-Seq, and AmpSeq data for analysis of powdery mildew resistance in grapevine.
L. CADLÉ-DAVIDSON (1), D. Gadoury (2), Q. Sun (2), P. Schweitzer (2), J. Londo (1), C. Ledbetter (1), M. Clark (3), J. Luby (3), S. Teh (3), P. Barba (2), J. Fresnedo-Ramírez (2), S. Yang (2), E. Takacs (2), B. Reisch (2), (1) USDA-ARS, U.S.A.; (2) Cornell University, U.S.A.; (3) University of Minnesota, U.S.A.

10:45a.m. • Discussion

The Function and Mechanism of CRISPR and Its Applications
8:00 - 11:00 a.m.; Room 20-21, CC

Organizers: Nian Wang, University of Florida, Lake Alfred, FL, U.S.A.; Rodolphe Barrangou, North Carolina State University, Raleigh, NC, U.S.A.

Moderators: Nian Wang, University of Florida, Lake Alfred, FL, U.S.A.; Rodolphe Barrangou, North Carolina State University, Raleigh, NC, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Bacteriology Committee

Financial Sponsor: The Widely Prevalent Plant Pathogenic Bacteria Subcommittee

8:00 a.m. • 68-S

Activity and repurposing of native CRISPR-CAS systems.
R. BARRANGOU (1), (1) NC State University, Raleigh, NC, U.S.A.

8:30 a.m. • 69-S

CRISPR RNA-guided Genome Editing in Human Stem Cells, Animals, and Plants.
J. KIM (1), (1) Center for Genome Engineering, Institute for Basic Science, Seoul, South Korea

9:00 a.m. • 70-S

CRISPR/dCas9 technologies for transcriptome manipulation and disease research.
S. QI (1), (1) Stanford University, Stanford, CA, U.S.A.

9:30 a.m. • Break

9:45 a.m. • 71-S

Development of citrus canker resistant varieties by manipulation of *CsLOB1*, the citrus susceptibility gene to *Xanthomonas citri*, using Cas9/sgRNA. N. WANG (1), H. Jia (1), (1) University of Florida, Lake Alfred, FL, U.S.A.

10:15 a.m. • 72-S

Revenge of the phage: Anti-CRISPRs strike back.
J. BONDY-DENOMY (1), (1) University of California, San Francisco, San Francisco, CA, U.S.A.

10:45 a.m. • Discussion

New Products and Services
8:00 – 11:00 a.m.; Room 14, CC

Organizer: Sridhara Kunjeti, University of California-Davis, Salinas, CA, U.S.A.

Moderators: Sridhara Kunjeti, University of California-Davis, Salinas, CA, U.S.A. ; Leah Granke, Dow AgroSciences, Hilliard, OH, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Industry Committee

8:00 a.m.

Prestop Biofungicide,
J. MANELEY (1), (1) Agbio, Westminster, CO, U.S.A.

8:15 a.m.

PerCarb Bactericide/Fungicide,
V. CHOPPAKATLA (1), (1) BioSafe Systems, East Hartford, CT, U.S.A.

8:30 a.m.

MBI-110 Marrone,
T. JOHNSON (1), (1) Bio Innovations, Davis, CA, U.S.A.

8:45 a.m.

BioSpectra 100SC,
R. KIM (1), (1) Pace International, Wapato, WA, U.S.A.

9:00 a.m.

Lumisena Seed treatment fungicide.
R. SABETKA (1), Pioneer (1), Johnston, IA, U.S.A.

9:15 a.m.

Orkestra Fungicide for Ornamentals,
R. KESSE (1), BASF Corp (1), Florham Park, NJ, U.S.A.

9:30 a.m. • Break

9:45 a.m.

New uses on existing and recently registered fungicides,
R. BOUNDS (1), (1) Syngenta Crop Protection, Greensboro, NC, U.S.A.

10:00 a.m.

Averlance,
C. IRWIN (1), (1) Vive Crop Protection, Toronto, Ontario, Canada

10:15 a.m.

DEKALB Disease Shield,
K. ANDERSON (1), (1) Monsanto, St. Louis, MO, U.S.A.

10:30 a.m.

Ethaboxam: A New fungicide for oomycete disease control,
K. SEEBOLD (1), (1) Valent USA Corporation, Lexington, KY, U.S.A.

10:45 a.m.

Kabuto Fungicide,
C. GEE (1), (1) SC ISK Biosciences, Kansas City, MO, U.S.A.

Reviewing a Manuscript 101
8:00 – 11:00 a.m.; Room 13, CC

Organizers: Thomas Mitchell, Professor, Ohio State University and Nik Grunwald, Research Plant Pathologist, USDA ARS

Section: Professionalism/Outreach

Sponsoring Committees/Sponsors: APS Editorial Board and Office of Education

Krishna Subbarao, *Phytopathology* Editor-in-Chief, University of California, Davis, U.S.A.

John McDowell, *MPMI* Editor-in-Chief, Virginia Tech, Blacksburg, VA, U.S.A.

Alison Robertson, *Plant Disease* Editor-in-Chief, Iowa State University, Ames, IA, U.S.A.

Carolyn Young, *Phytobiomes* Editor-in-Chief, Samuel Robert Noble Foundation, Ardmore, OK, U.S.A.

Pamela Roberts, *Plant Health Progress* Editor-in-Chief, University of Florida, Immokalee, FL, U.S.A.

8:00 a.m. Technical Sessions

Pathogen Detection

8:00 - 9:15 a.m.; Room 16, CC

Moderators: Muhammad Mohsin Raza, Iowa State University, Ames, IA, U.S.A.; Neil Boonham, Fera, York, UK

8:00 a.m. • 41-O

Precision diagnostics and next-generation decision support systems.

N. BOONHAM (1), J. Turner (2), I. Brittain (2), D. McCluskey (3), R. Kaye (3), D. Clarke (4), N. Morant (4), D. Langton (5), F. Salinari (5), W. Charlton (6), M. Andreou (7), (1) Fera, York, United Kingdom; (2) Fera, United Kingdom; (3) University of Hertfordshire, United Kingdom; (4) GenSys Biotech Ltd, United Kingdom; (5) Agrii, United Kingdom; (6) Bayer Crop Sciences, United Kingdom; (7) Optisense Ltd, United Kingdom

8:15 a.m. • 42-O

Next generation sequencing evaluation for detection of potential threats or emerging forest pest, entry point from spore and insect traps.

G. BILODEAU (1), E. Tremblay (2), J. Bérubé (3), (1) Canadian Food Inspection Agency, Ottawa, Canada; (2) Canadian Food Inspection Agency, Canada; (3) Natural Resources Canada, Canada

8:30 a.m. • 43-O

An inexpensive visual PCR method for field detection of *Candidatus Liberibacter asiaticus* associated with citrus huanglongbing.

M. KEREMANE (1), C. Ramadugu (2), D. Hall (3), (1) USDA ARS, Riverside, CA, U.S.A.; (2) University of California Riverside, Riverside, CA, U.S.A.; (3) US Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.

8:45 a.m. • 44-O

Comparison of two deep sequencing methods for the detection of viruses in sweet potato.

R. LI (1), M. Cao (2), P. Lan (3), J. Abad (4), C. Zhou (5), (1) USDA-ARS, U.S.A.; (2) Southwest University of China, Chongqing, China; (3) Yunnan Agricultural University, China; (4) USDA-APHIS, U.S.A.; (5) Southwest University of China, China

9:00 a.m. • 45-O

Fluorogenic Detection of Plant Viruses by Helicase Dependent Amplification with Self-Quenched Primers.

S. MOLINA CÁRDENAS (1), A. Salazar Aguirre (1), F. Ochoa-Corona (1), J. Olson (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.

Pathogen Ecology

8:00 - 9:15 a.m.; Room 18-19, CC

Moderators: Grazieli Araldi Da Silva, Iowa State University, Ames, IA, U.S.A.; Jianan Wang, University of Florida, Gainesville, FL, U.S.A.

8:00 a.m. • 46-O

Long-term rotation history and previous crop effects on corn seedling health.

M. BENITEZ (1), S. Osborne (2), M. Lehman (2), (1) USDA, North Central Agricultural Research Laboratory, Brookings, SD, U.S.A.; (2) USDA, North Central Agricultural Research Laboratory, Brookings, SD, U.S.A.

8:15 a.m. • 47-O

Evidence for sexual reproduction in *Fusicladium effusum*.

N. CHARLTON (1), C. Martupalli (2), B. Wood (3), C. Bock (3), C. Young (2), (1) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.; (2) The Samuel Roberts Noble Foundation, U.S.A.; (3) USDA-ARS-SEFTNRL, U.S.A.

8:30 a.m. • 48-O

Ecological Impact of Signaling Chemicals on *Phytophthora erythroseptica*.

H. JIANG (1), J. Hao (1), (1) University of Maine, Orono, ME, U.S.A.

8:45 a.m. • 49-O

Model for the geographic origin and spread of the globally distributed pathogen *Phytophthora palmivora*.

J. WANG (1), E. Goss (1), M. Coffey (1), (1) University of Florida, Gainesville, FL, U.S.A.

9:00 a.m. • Discussion

9:45 a.m. Technical Sessions

Bacterial Virulence Regulation

9:45 - 11:00 a.m.; Room 16, CC

Moderator: Roshni Kharadi, Michigan State University, Lansing, MI, U.S.A.

9:45 a.m. • 51-O

The *in planta* regulon of the major *Ralstonia solanacearum* virulence regulator PhcA.

D. KHOKHANI (1), T. Tran Minh (1), C. Allen (1), (1) UNIVERSITY OF WISCONSIN-MADISON, MADISON, WI, U.S.A.

10:00 a.m. • 52-O

Determination of CsrA/RsmA regulon in *Xanthomonas citri* subsp. *citri*.

M. ANDRADE (1), (1) Dept. Microbiology and Cell Science, CREC- University of Florida, FL, U.S.A.

10:15 a.m. • 53-O

Construction of phosphodiesterase mutants in *Erwinia amylovora* to evaluate the role of cyclic di-GMP in virulence regulation.

R. KHARADI (1), R. Kharadi (1), L. Castiblanco (1), G. Sundin (1), (1) Michigan State University, East Lansing, MI, U.S.A.

10:30 a.m. • 54-O

Characterization of RpfB-dependent DSF-Family Quorum Sensing Signal Turnover System in the Phytopathogen *Xanthomonas*.

L. ZHOU (1), X. Wang (1), Y. He (1), (1) Shanghai Jiao Tong University, Shanghai, China

10:45 a.m. • 55-O

Integration of plant host-derived signals to coordinate developmental processes involved in *Pantoea stewartii* subsp. *stewartii* biofilm maturation.

M. ROPER (1), M. Roper (1), (1) University of California, Riverside, Riverside, CA, U.S.A.

Population Dynamics

9:45 - 11:00 a.m.; Room 18-19, CC

Moderators: Amanda Warner, Southern Illinois University, Carbondale, IL, U.S.A.; Emma Wallace, North Carolina State University, Raleigh, NC, U.S.A.

9:45 a.m. • 56-O

Epidemiology and Population Biology of Grape Downy Mildew (*Plasmopara viticola*) in Georgia.

C. HONG (1), P. Brannen (1), H. Scherm (1), (1) University of Georgia, Athens, GA, U.S.A.

10:00 a.m. • 57-O

Changes in *Plasmopara obducens* population structure corresponded with the emergence and rapid spread of the impatiens downy mildew epidemics.

C. SALGADO-SALAZAR (1), Y. Rivera (1), (1) USDA-ARS, Rutgers University, Beltsville, MD, U.S.A.

10:15 a.m. • 58-O

Emergent rudbeckia downy mildew epidemics caused by *Plasmopara halstedii* are genetically distinct from the pathogen populations infecting sunflower.

Y. RIVERA (1), C. Salgado-Salazar (1), T. Gulya (2), J. Crouch (3), (1) USDA-ARS Systematic Mycology and Microbiology Laboratory and Rutgers University, Beltsville, MD, U.S.A.; (2) USDA ARS Sunflower and Plant Biology Research Unit, Fargo, ND, U.S.A.; (3) USDA-ARS Systematic Mycology and Microbiology Laboratory, Beltsville, MD, U.S.A.

10:30 a.m. • 59-O

Pseudoperonospora cubensis on commercial and non-commercial cucurbits in North Carolina: population structure determined by simple sequence repeats.

E. WALLACE (1), L. Quesada-Ocampo (2), (1) NCSU, Raleigh, NC, U.S.A.; (2) NCSU, U.S.A.

10:45 a.m. • 60-O

Species diversity and population structure of *Pythium* and *Globisporangium* in Long Island, NY ornamental greenhouses in 2014.

M. PROANO (1), C. Ayala (2), A. Chiriboga (2), M. Daughtrey (3), C. Garzon (4),

S. Marek (1), H. Melouk (1), S. Marek (4), (1) OKLAHOMA STATE UNIVERSITY, STILLWATER, OK, U.S.A.; (2) Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador, Ecuador; (3) Cornell University, Long Island Horticultural Research & Extension Center, Riverhead, NY, U.S.A.; (4) OKLAHOMA STATE UNIVERSITY, U.S.A.

TUESDAY AFTERNOON, AUGUST 2

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 www.apsnet.org/meetings/annual/scientificprogram/Pages. 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

Intro to Phytobiome Competitive Grants (NSF/NIFA)

1:30 – 2:45 p.m.; Room 20-21, CC

Organizers: JP Dundore-Arias, University of Minnesota and APS-PPB Early Career Intern; Steve Lindow, University of California-Berkeley, CA, U.S.A.; Linda Kinkel, University of Minnesota, St. Paul, MN, U.S.A.

Moderator: JP Dundore-Arias, University of Minnesota and APS-PPB Early Career Intern

The Phytobiome Initiative has captured major scientific interest among APS members and spawned a rapidly growing community of scientists interested in incorporating phytobiome-based knowledge and approaches into their own research. However, new phytobiome researchers can have trouble securing funding to support their research. This session has the goal to inform APS early-career scientists and established researchers about agencies and funding programs that welcome phytobiome related proposals, and to provide insights into strategies for developing competitive grant proposals from the perspectives of experienced grant review panelists and National Program Directors.

Presentations and Speakers:

How to develop competitive hypothesis-driven Phytobiome proposals: Steve Lindow, University of California, Berkeley, CA, U.S.A.

Opportunities for Phytobiome related projects in the new dual agency Plant-Biotic Interactions Program: Ann Lichens-Park, USDA-NIFA, Washington, D.C., U.S.A.

Competitive funding opportunities for Early Career Scientists in Phytobiome related fields: Diane Okamuro, NSF, Washington, D.C., U.S.A.

Panel discussion; Q&A session

Special Sessions

Balancing a Successful Career and Family

1:30 - 2:45 p.m.; Room 16, CC

Organizers: Julia Crane, Valent BioSciences Corporation, Long Grove, IL, U.S.A.; Fulya Baysal-Gurel, Tennessee State University, McMinnville, TN, U.S.A.; Marin Brewer, University of Georgia, Athens, GA, U.S.A.

Moderators: Lance Cadle-Davidson, USDA ARS GGRU, Geneva, NY, U.S.A.; Molly Cadle-Davidson, Advanced Biological Marketing, Geneva, NY, U.S.A.; Amy Charkowski, University of Wisconsin, Madison, WI, U.S.A.; Carla Garzon, Oklahoma State

University, Stillwater, OK, U.S.A.; Timothy Murray, Washington State University, Pullman, WA, U.S.A.; Francesca Peduto Hand, The Ohio State University, Columbus, OH; Samantha Thomas, Monsanto Vegetable Seeds, St. Louis, MO, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committees/Sponsors: Graduate Student, Early Career Professionals, and Career Advancement and Development Resources and Education (CADRE) Committees

1:30 p.m. • 85-S

Balancing a Successful Career and Family

J. CRANE (1), F. Baysal-Gurel (2), M. Brewer (3), (1) Valent BioSciences Corporation, U.S.A.; (2) Tennessee State University, U.S.A.; (3) University of Georgia, Athens, U.S.A.

Translational Research for the Management of Complex Diseases

1:30 - 2:45 p.m.; Room 15, CC

Organizers: Won-Bo Shim, Texas A&M University, College Station, TX, U.S.A.; Charles Woloshuk, Purdue University, West Lafayette, IN, U.S.A.

Moderator: Dr. Charles Woloshuk, Purdue University, West Lafayette, IN, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Mycotoxicology, Molecular and Cellular Phytopathology, Biological Control, and Integrated Plant Disease Management Committees

1:30 p.m. • 86-S

Management of *Aspergillus* and *Fusarium* ear rot diseases.

K. WISE (1), T. Isakeit (2), R. Heiniger (3), C. Woloshuk (4) (1) Purdue University, U.S.A.; (2) Texas A&M University, U.S.A.; (3) North Carolina State University, U.S.A.; (4) Purdue University, U.S.A.

1:45 p.m. • 87-S

Identifying new genetic targets for maize ear rot and mycotoxin control through computational subnetwork module analyses.

W. SHIM (1), M. Kim (1), H. Zhang (1), H. Yan (1), B. Yoon (1), G. Payne (2), C. Woloshuk (3) (1) Texas A&M University, U.S.A.; (2) North Carolina State University, U.S.A.; (3) Purdue University, U.S.A.

2:00 p.m. • 88-S

Accelerating the selection of candidate genes to control mycotoxin contamination of maize through host-induced gene silencing (HIGS).

B. BLUHM (1), J. Smith (2), Y. Ramegowda (2), B. Dhillon (2), W. Shim (3), C. Woloshuk (4), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Arkansas, U.S.A.; (3) Texas A&M University, U.S.A.; (4) Purdue University, U.S.A.

2:15 p.m. • 89-S

Developing the next generation of biological control: Genomic approaches for predicting most effective stains.

I. CARBONE (1), M. Sexton (1), R. Gell (1), J. White (1), R. Singh (1), T. Isakeit (2), B. Bluhm (3), K. Wise (4), C. Woloshuk (4), B. Horn (5), R. Heiniger (6), (1) Center for Integrated Fungal Research, Department of Plant Pathology, North Carolina State University, Raleigh, NC, U.S.A.; (2) Department of Plant Pathology and Microbiology, Texas A&M University, College Station, TX, U.S.A.; (3) Department of Plant Pathology,

University of Arkansas, Fayetteville, AR, U.S.A.; (4) Department of Plant Pathology and Botany, Purdue University, West Lafayette, IN, U.S.A.; (5) United States Department of Agriculture, Agricultural Research Service, Dawson, GA, U.S.A.; (6) Department of Crop Science, North Carolina State University, Raleigh, NC, U.S.A.

2:30 p.m. • Discussion

Technical Sessions

Fungicide Resistance

1:30 - 2:45 p.m.; Room 13, CC

Moderators: Haoxi Li, University of Georgia, Athens, GA, U.S.A.; Giberto Olaya, Syngenta Crop Protection, Vero Beach, FL, U.S.A.

1:30 p.m. • 61-O

ADEPIDYNTM fungicide: Cross resistance patterns in *Alternaria solani*.

G. OLAYA (1), R. Linley (2), K. Edlebeck (2), T. Harp (3), (1) Syngenta, Vero Beach, FL, U.S.A.; (2) Syngenta, Vero Beach, FL, U.S.A.; (3) Syngenta, Greensboro, NC, U.S.A.

1:45 p.m. • 62-O

Fungicide resistance profiles of unique and clonal genotypes of gummy stem blight fungi from the southeastern United States.

H. LI (1), K. Stevenson (2), M. Brewer (1), (1) University of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Tifton, GA, U.S.A.

2:00 p.m. • 63-O

Survey for Quinone Outside Inhibitor Resistant *Cercospora sojina* in Virginia Soybeans.

T. ZHOU (1), (1) Virginia Tech Tidewater AREC, Suffolk, VA, U.S.A.

2:15 p.m. • 64-O

Fitness and competition studies of QoI resistant and sensitive *Cercospora sojina* isolates, the causal agent of frogeye leaf spot.

B. LIN (1), H. Kelly (1), H. Yu (2), A. Mengistu (3), (1) University of Tennessee-Entomology & Plant Pathology, Jackson, TN, U.S.A.; (2) University of Tennessee-Entomology & Plant Pathology, U.S.A.; (3) United States Department of Agriculture, Agricultural Research Service (USDA-ARS), U.S.A.

2:30 p.m. • 65-O

Assessing potential virulence differences between QoI-sensitive and -resistant *Cercospora sojina* isolates from Mississippi soybean.

N. BROCHARD (1), M. Tomaso-Peterson (2), T. Allen (3), R. Melanson (3), (1) Mississippi State University, Starkville, MS, U.S.A.; (2) Mississippi State University, Starkville, MS, U.S.A.; (3) Mississippi State University, U.S.A.

Host Plant Resistance

1:30 - 2:45 p.m.; Room 18-19, CC

Moderators: Jordan Briggs, University of Minnesota, St. Paul, MN, U.S.A.; Ana Christina Fulladolsa, University of Wisconsin, Madison, WI, U.S.A.

1:30 p.m. • 66-O

Characterization of Arabidopsis Defense-related Gene Homologues in Tomato and Strawberry.

J. PEREIRA (1), K. Silva (2), M. Garald (3), J. Jeffrey (3), Z. Mou (3), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Salve Regina University, U.S.A.; (3) University of Florida, U.S.A.

1:45 p.m. • 67-O

Speeding up the discovery of novel sources of leaf rust resistance in wheat.

A. RIAZ (1), N. Athiyannan (2), S. Periyannan (3), O. Afanasenko (4), O. Mitrofanova (5), E. Aitken (6), E. Lagudah (3), L. Hickey (2), (1) The University of Queensland, Queensland Alliance for Agriculture and Food Innovation, St Lucia, QLD 4072, Australia, Brisbane, QC, Australia; (2) The University of Queensland, Queensland Alliance for Agriculture and Food Innovation, St Lucia, QLD 4072, Australia, Australia; (3) Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia; (4) Department of Plant Resistance to Diseases of All Russian Research Institute for Plant Protection, Pushkin, 196608, Russia, Russia; (5) N. I. Vavilov Institute of Plant Genetic Resources, Bolshaya Morskaya 42-44, Saint Petersburg, 190000, Russia, Russia; (6) The University of Queensland, School of Agriculture and Food Science, St Lucia, QLD 4072, Australia, Australia

2:00 p.m. • 68-O

Mapping of two QTL conferring adult plant resistance to *Puccinia graminis* f. sp. *tritici* race TTKSK (Ug99) and evidence for race specificity.

J. BRIGGS (1), M. Rouse (2), S. Bhavani (3), C. Hiebert (4), (1) University of Minnesota, Saint Paul, MN, U.S.A.; (2) USDA-ARS, Saint Paul, MN, U.S.A.; (3) CIMMYT, Kenya; (4) Agriculture and Agri-Food Canada, Canada

2:15 p.m. • 69-O

Utilizing mapping-by-sequencing to identify the Dominant Net Form Net Blotch Resistance Gene from Barley Line CI 5791.

P. TAMANG (1), R. Brueggeman (1), J. Richards (1), T. Friesen (2), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) Cereal Crops Research, USDA, Fargo, ND, U.S.A.

2:30 p.m. • 70-O

Development of molecular markers tightly linked to *Potato virus Y* resistance gene *Ryhc* in a diploid potato population.

A. FULLADOLSA (1), S. Jansky (2), D. Halterman (3), A. Charkowski (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) USDA-ARS, University of Wisconsin-Madison, Madison, WI, U.S.A.; (3) USDA-ARS, Madison, WI, U.S.A.

Metagenomics and the Phytobiome

1:30 - 2:45 p.m.; Room 22-23, CC

Moderators: Jillian Lang, Colorado State University, Fort Collins, CO, U.S.A.; Patrik Inderbitzin, University of California, Davis, CA, U.S.A.

1:30 p.m. • 71-O

Metabarcoding the soybean seed core mycobiome.

R. PEDROZO (1), A. Jumpponen (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.

1:45 p.m. • 72-O

Soil microbiomes associated with alternative strategies to manage *Verticillium dahlia*.

P. INDERBITZIN (1), J. Ward (2), A. Barbella (2), N. Solares (2), B. Calderon (2), D. Chellemi (2), K. Subbarao (1), (1) UC Davis, Davis, CA, U.S.A.; (2) Driscoll's Strawberry Associates, Watsonville, CA, U.S.A.

2:00 p.m. • 73-O

Root and rhizosphere microbiome responses to new tomato rootstock systems.

R. POUDEL (1), L. Meyer (2), A. Jumpponen (3), M. Kelleny (4), C. Rivard (2), B. Cordova (5), J. Brisbane (5), K. Garrett (5), (1) Plant Pathology Department, Institute for Sustainable Food Systems, and Emerging Pathogens Institute, Gainesville, FL, U.S.A.; (2) Horticulture, Forestry, and Recreational Resources, Kansas State University, Olathe, KS, U.S.A.; (3) Division of Biology and Ecological Genomics Institute, Kansas State University, Manhattan, KS, U.S.A.; (4) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (5) Plant Pathology Department, Institute for Sustainable Food Systems, and Emerging Pathogens Institute, University of Florida, Gainesville, FL, U.S.A.

2:15 p.m. • 74-O

Genetic determinants of bacterial adaptation to plants.

A. LEVY (1), A. Levy (1), (1) DOE Joint Genome Institute, Walnut Creek, CA, U.S.A.

2:30 p.m. • 75-O

Unravelling the sugarcane microbiome to resolve the Yellow Canopy Syndrome in Australia.

K. HAMONTS (1), P. Trivedi (2), A. Garg (2), P. Holford (3), J. Grinyer (2), I. Anderson (2), B. Singh (2), (1) Hawkesbury Institute for the Environment, Penrith, Australia; (2) Hawkesbury Institute for the Environment, Western Sydney University, Australia; (3) School of Science and Health, Western Sydney University, Australia

Pathogen Diversity

1:30 - 2:45 p.m.; Room 14, CC

Moderators: Megan Hall, Cornell University, Ithaca, NY, U.S.A.; Jane Stewart, Colorado State University, Fort Collins, CO, U.S.A.

1:30 p.m. • 76-O

Illuminating the diversity of rust fungi infecting millets.

J. DEMERS (1), L. Castlebury (1), (1) USDA-ARS, Beltsville, MD, U.S.A.

1:45 p.m. • 77-O

Genetic diversity of *Colletotrichum* isolates from *Sorghum bicolor* and *S. halepense* in the Southeastern United States.

K. XAVIER (1), C. Schardl (1), E. Buiate (1), M. Torres (2), M. Queiroz (3), S. Chopra (4), L. Vaillancourt (5), (1) Department of Plant Pathology, University of Kentucky, Lexington, KY, U.S.A.; (2) Functional Genomics Laboratory, Cornell University/Qatar Foundation, Education City, Other, Qatar; (3) Laboratório de Genética Molecular e de Micro-organismo, Viçosa, KY, U.S.A.; (4) Department of Plant Science, Pennsylvania State University, University Park, PA, U.S.A.; (5) Department of Plant Pathology, University of Kentucky, Lexington, KY, U.S.A.

2:00 p.m. • 78-O

Phylogenetic and population analyses of the brown root-rot pathogen (*Phellinus noxius*) highlight the existence of two distinct populations.

J. STEWART (1), N. Sahashi (2), T. Hattori (2), Y. Ota (2), L. Shuey (3), R. Schlub (4), N. Atibalentia (5), F. Brooks (6), A. Tang (7), R. Lam (7), M. Leung (8), L. Chu (9), H. Kwan (9), A. Mohd Farid (10), S. Lee (10), C. Chung (11), H. Lee (11), Y. Huang (11), R. Liou (11), J. Tsai (12), P. Cannon (13), J. Hanna (14), N. Klopfenstein (14), M. Kim (15), (1) Colorado State University, Fort Collins, CO, U.S.A.; (10) Forest Research Institute, Kepong, Selango, Malaysia; (11) Department of Plant Pathology and Microbiology, National Taiwan University, Taiwan; (12) Taiwan Agricultural Research Institute, Taiwan; (13) USDA Forest Service, Forest Health Protection, Vallejo, CA,

U.S.A.; (14) RMRS, USDA Forest Service, Moscow, ID, U.S.A.; (15) Department of Forestry, Environment and Systems, Kookmin University, Korea; (2) Forestry and Forest Products Research Institute, Tsukuba, Ibaraki, Japan; (3) Forestry & Agricultural Research Institute, University of Pretoria, South Africa; (4) University of Guam, ANR/CES/CNAS, Mangilao, Guam, U.S.A.; (5) American Samoa Community College-CNR, Division of Community & Natural Resources, U.S.A.; (6) Department of Plant and Environmental Protection Sciences, University of Hawaii-Manoa, Honolulu, HI, U.S.A.; (7) Muni Arborist Limited, Hong Kong, China; (8) Muni Arborist Limited, China; (9) School of Life Sciences, The Chinese University of Hong Kong, Hong Kong, China

2:15 p.m. • 79-O

Microsatellite genotyping reveals high genetic diversity in *Phytophthora infestans* from Mexico.

S. SHAKYA (1), M. Larsen (2), M. Condoy (3), H. Lozoya-Saldana (3), N. Grunwald (2), (1) OREGON STATE UNIVERSITY, Corvallis, OR, U.S.A.; (2) USDA-ARS, U.S.A.; (3) Universidad Autónoma Chapingo, Mexico

2:30 p.m. • 80-O

Characterization of isolates of *Phytophthora capsici* from the mid-Atlantic region, US.

N. ABEYSEKARA (1), H. Hickman (2), S. Westhafer (2), N. Gregory (2), G. Johnson (2), T. Evans (2), N. Donofrio (2), (1) University of Delaware, Newark, DE, U.S.A.; (2) University of Delaware, Newark, DE, U.S.A.

WEDNESDAY MORNING, AUGUST 3

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 www.apsnet.org/meetings/annual/scientificprogram/Pages. 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 author/presenter and has NOT been edited.

Hot Topic

Everything You Need to Know about CRISPR

10:15 – 11:30 a.m.; Room 24-25, CC **LiveStream Session**

Organizer/Moderator: Shaun Curtin, USDA-ARS Cereal Disease Laboratory, St. Paul, MN, U.S.A.

The development of the CRISPR/Cas9 reagent has been an important break-through discovery in the field of genome engineering. It has allowed the researcher with minimal molecular biology specialization to perform targeted mutagenesis and gene editing on any plant or pathogen host amenable to transformation. These developments will undoubtedly benefit future plant pathology research as recent reports of engineered pathogen resistant plants have indicated. In this session we hope to encourage both APS early-career scientists and established researchers to initiate their own genome engineering project by demonstrating the ease of use and remarkable efficiency of the CRISPR/Cas9 reagent.

Presentations and speakers:

Introduction and overview of site-directed mutagenesis platforms: Shaun Curtin, USDA-ARS Cereal Disease Laboratory, St. Paul, MN, U.S.A.

Optimizing gene editing using a multi-purpose cloning system for plant genome engineering: Tomas Cermak, Center for Genome Engineering, University of Minnesota, St. Paul, MN, U.S.A.

Characterization of a unique secreted peptide family in Medicago by multiplex genome editing: Diana Trujillo, Department of Plant Biology, University of Minnesota, St. Paul, MN, U.S.A.

Panel discussion Q&A session

Technical Sessions

Bacterial Disease Management

10:15 - 11:30 a.m.; Room 15, CC

Moderators: Mayara Murata, University of Florida, Winter Haven, FL, U.S.A.; Tad Smith, Bayer CropScience Division, Sacramento, CA, U.S.A.

10:15 a.m. • 81-O

Epidemiology and management of bacterial leaf spot caused by novel *Pseudomonas syringae* strains on watermelon in Florida.

E. NEWBERRY (1), L. Ritchie (1), B. Babu (1), T. Sanchez (2), K. Beckham (2), J. Jones (2), J. Freeman (1), N. Dufault (2), M. Paret (1), (1) NFREC, University of Florida, Quincy, FL, U.S.A.; (2) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.

10:30 a.m. • 82-O

Whole genome sequencing of *Xanthomonas perforans* identifies effectors that influence breeding strategies.

S. TIMILSINA (1), P. Abrahamian (2), N. Potnis (3), G. Minsavage (4), F. White (4), B. Staskawicz (5), J. Jones (4), G. Vallad (4), E. Goss (4), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Gulf Coast Research and Education Center, University of Florida, FL, U.S.A.; (3) United States Department of Agriculture, Charleston, SC, U.S.A.; (4) University of Florida, U.S.A.; (5) University of California-Berkeley, U.S.A.

10:45 a.m. • 83-O

Cybridization: A promising plant resistance for citrus canker control.

M. MURATA (1), A. Omar (1), C. Chase (2), J. Grosser (1), J. Graham (1), (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.

11:00 a.m. • 84-O

Biological control of plant pathogenic bacteria.

G. KRITZMAN (1), G. Kritzman (2), (1) Nobactra, Raanana, Israel; (2) Nobactra, Raanana, Israel

11:15 a.m. • 85-O

Investigation of the anti-bacterial activity of SERENADE® ASO against bacterial diseases of crops.

T. SMITH (1), T. Knobloch (2), (1) Bayer, Crop Science Division - Biologics Research, West Sacramento, CA, U.S.A.; (2) Bayer, Crop Science Division - Small Molecule Research, Lyon, France

Biological & Cultural Disease Management

10:15 - 11:30 a.m.; Room 22-23, CC

Moderators: Sarah Bardsley, Penn State University, Biglerville, PA, U.S.A.; Gul Ali, University of Florida, Apopka, FL, U.S.A.

10:15 a.m. • 86-O

Grass residues as a sustainable carbon source in application of anaerobic soil disinfestation for control of apple nursery replant disease.

S. HEWAVITHARANA (1), M. Mazzola (2), (1) Washington State University, Wenatchee, WA, U.S.A.; (2) USDA-ARS, Wenatchee, WA, U.S.A.

10:30 a.m. • 87-O

Management of Fusarium wilt Tropical race 4 in bananas.

A. DRENTH (1), J. Henderson (2), A. Drenth (2), (1) The University of Queensland, Dutton Park, Other, Australia; (2) The University of Queensland, Dutton Park, Australia

10:45 a.m. • 88-O

Pseudomonas sp associated with *Smilax bona-nox* display strong activity against *Phytophthora* spp.

G. ALI (1), A. El-Sayed (2), D. Norman (2), M. Brennan (3), (1) University of Florida, Apopka, FL, U.S.A.; (2) University of Florida/ Institute of Food and Agricultural Sciences, Apopka, FL, U.S.A.; (3) MREC/University of Florida/ Institute of Food and Agricultural Sciences, Apopka, FL, U.S.A.

11:00 a.m. • 89-O

Efficacy of biopesticides on root diseases and pests in hydroponic production of vegetables.

A. POLEATEWICH (1), R. Buitenhuis (1), M. Brownbridge (1), T. Cranmer (1), A. Summerfield (1), (1) Vineland Research and Innovation Centre, Vineland Station, ON, Canada

11:15 a.m. • 90-O

Organic rice disease management research in the United States.

X. ZHOU (1), X. Zhou (1), (1) Texas A&M AgriLife Research, Beaumont, TX, U.S.A.

Fungal Genomics

10:15 - 11:30 a.m.; Room 20-21, CC

Moderators: Allysson Lunos, Louisiana State University, Baton Rouge, LA, U.S.A.; Kenneth Shenge, USDA ARS, Tucson, AZ, U.S.A.

10:15 a.m. • 91-O

Elucidating the genetic basis of race differentiation in *Cercospora soja* through genotype-by-sequencing approaches.

S. SHARMA (1), B. Dhillon (1), A. Fakhoury (2), B. Bluhm (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) Southern Illinois University, Carbondale, IL, U.S.A.

10:30 a.m. • 92-O

RNA-Seq analysis of *stuA* mutants in *Fusarium verticillioides* indicates dramatic genomic wide transcriptional reprogramming.

M. RATH (1), N. Crenshaw (2), S. Gold (2), (1) University of Georgia & USDA, Athens, GA, U.S.A.; (2) USDA, Athens, GA, U.S.A.

10:45 a.m. • 93-O

Enhancing our understanding of Fusarium maize stalk rot pathogenesis through gene association subnetwork module analyses.

H. ZHANG (1), H. Zhang (2), M. Kim (2), H. Yan (2), B. Yoon (2), W. Shim (2), (1) Texas A&M university, TX, U.S.A.; (2) Texas A&M university, U.S.A.

11:00 a.m. • 94-O

Genetic basis for pathogenicity in *Fusarium oxysporum* f.sp. *cepae* causing basal rot in onion.

J. CLARKSON (1), A. Taylor (1), A. Jackson (1), A. Armitage (3), R. Harrison (3), (1) Warwick Crop Centre, University of Warwick, United Kingdom; (2) Warwick Crop Centre, University of Warwick, Wellesbourne, United Kingdom; (3) East Malling Research, East Malling, United Kingdom

11:15 a.m. • 95-O

Quantitative pyrosequencing for rapid detection and quantification of *Aspergillus flavus* atoxigenic active ingredients in complex fungal communities.

K. SHENGE (1), B. Adhikari (1), K. Callicott (1), R. Bandyopadhyay (2), P. Cotty (3), (1) USDA-ARS, Tucson, AZ, U.S.A.; (2) International Institute of Tropical Agriculture (IITA), Ibadan, Other, Nigeria; (3) USDA-ARS, Tucson, U.S.A.

Liberibacter

10:15 - 11:30 a.m.; Room 18-19, CC

Moderators: Naweena Thapa, University of Florida, Lake Alfred, FL, U.S.A.; Judith Brown, University of Arizona, Tucson, AZ, U.S.A.

10:15 a.m. • 96-O

Engineering mobile RNA in Carrizo to enhance plant defense responses to control citrus greening.

S. ZHANG (1), G. Perazzo (1), D. Gabriel (1), (1) Integrated Plant Genetics, Gainesville, FL, U.S.A.

10:30 a.m. • 97-O

Developing resistance to citrus huanglongbing.

C. RAMADUGU (1), M. Keremane (2), T. McCollum (3), D. Hall (3), M. Roose (1), (1) University of California Riverside, Riverside, CA, U.S.A.; (2) USDA ARS National Clonal Germplasm Repository for Citrus and Dates, Riverside, CA, U.S.A.; (3) US Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.

10:45 a.m. • 98-O

Proposed model for *Candidatus Liberibacter asiaticus* and solanacearum systemic invasion and multiplication in the psyllid host and vector.

J. BROWN (1), T. Rast (1), J. Cicero (2), T. Fisher (1), (1) The University of Arizona, U.S.A.; (2) University of Florida, U.S.A.

11:00 a.m. • 99-O

Systemic infection of split root trees by *Candidatus Liberibacter asiaticus* suggests rapid movement between phloem sieve tubes.

J. ORROCK (1), J. Orrock (1), E. Johnson (1), (1) Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.

Plant Resistance

10:15 a.m. - 11:30 a.m.; Room 16, CC

Moderators: Juliana Pereira, University of Florida, Gainesville, FL, U.S.A.; Bradley Tonnessen, Colorado State University, Fort Collins, CO, U.S.A.

10:15 a.m. • 100-O

Cultivar-specific wheat miRNAs during stripe rust infection in *Triticum aestivum*.

S. RAMACHANDRAN (1), N. Mueth (1), P. Zheng (1), S. Hulbert (1), (1) Washington State University, Pullman, WA, U.S.A.

10:30 a.m. • 101-O

Antifungal mechanisms of a plant defensin MtDef4 are not conserved between ascomycete fungi, *Neurospora crassa* and *Fusarium graminearum*.

K. ISLAM (1), K. El-Mounadi (2), D. Shah (3), (1) Donald Danforth Center, St. Louis, MO, U.S.A.; (2) Kutztown University of Pennsylvania, Kutztown, PA, U.S.A.; (3) Donald Danforth Center, St. Louis, MO, Bangladesh

10:45 AM • 102-O

Identifying genetic variation in the *Sorghum* PAMP response.

D. CHEN (1), P. Balint-Kurti (2), G. Stacey (1), (1) Divisions of Plant Science and Biochemistry, University of Missouri-Columbia, MO, 65201, Columbia, MO, U.S.A.; (2) USDA-ARS, Department of Plant Pathology, North Carolina State University, Raleigh, NC, Raleigh, NC, U.S.A.

11:00 AM • 103-O

Understanding quantitative disease resistance in rice: defense response gene regulation and promoter patterns.

B. TONNESSEN (1), R. Mauleon (2), N. Alexandrov (2), J. Leach (3), (1) Colorado State University, CO, U.S.A.; (2) International Rice Research Institute, Philippines; (3) Colorado State University, U.S.A.

11:15 AM • 104-O

COS-OGA stimulates plant innate immunity in a cumulative process that involves salicylic acid.

G. VAN AUBEL (1), P. Van Cutsem (2), (1) University of Namur, Namur, Belgium; (2) University of Namur, Research Unit in Plant Cellular and Molecular Biology, Namur, Belgium

WEDNESDAY AFTERNOON, AUGUST 3

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 www.apsnet.org/meetings/annual/scientificprogram/Pages. 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

Fieldside Manner: Serving Plant Pathology's Stakeholders

1:00 - 2:15 p.m.; Room 18-19, CC

Organizers: Anna Testen, Ohio State University, Wooster, OH, U.S.A.; Elisha Allan-Perkins, University of Massachusetts-Amherst, Amherst, MA, U.S.A.; Samuel Markwell, North Dakota State University, Fargo, ND, U.S.A.

Moderators: Elisha Allan-Perkins, University of Massachusetts, Amherst, MA, U.S.A.; Rachel Capouya, The Ohio State University, Columbus, OH, U.S.A.

Section: Professionalism/Outreach

Sponsoring Committees/Sponsors: Graduate Student, Extension, and Early Career Professionals Committees

1:00 p.m. • 90-S

Tapping into growers' expertise: Effective engagement in extension. W. MAHAFFEE (1), (1) USDA ARS, Corvallis, OR, U.S.A.

1:15 p.m. • 91-S

Have I told you about the time...: Communicating "Plant Pathology" to diverse audiences in academia.

J. BRADEEN (1), D. VanBoxtel (2), (1) University of Minnesota, St. Paul, MN, U.S.A.; (2) University of Minnesota, U.S.A.

1:30 p.m. • 92-S

Think local, act globally: Meeting stakeholders' needs in developing countries.

A. TESTEN (1), S. Miller (1), (1) The Ohio State University, Wooster, OH, U.S.A.

2:00 p.m. • 94-S

The business of working with stakeholders.

W. DOLEZAL (1), (1) DuPont Pioneer, Ankeny, IA, U.S.A.

A Multidisciplinary Approach to Combating Rose Rosette Disease: Science to Practice

1:00 - 2:15 p.m.; Room 16, CC

Organizers: Ramon Jordan and John Hammond, USDA-ARS, US National Arboretum, Beltsville, MD, U.S.A.

Moderators: Ramon Jordan and John Hammond, USDA-ARS, US National Arboretum, Beltsville, MD, U.S.A.

Section: Diseases of Plants

Sponsoring Committees/Sponsors: Diseases of Ornamental Plants, Virology, Emerging Diseases and Pathogens, Diagnostics, Plant Pathogen and Disease Detection, and Integrated Plant Disease Management Committees

1:00 p.m. • 95-S

Rose rosette disease: History, symptoms, and viral pathogen.

I. TZANETAKIS (1), P. Di Bello (2), T. Druciarek (3), (1) Plant Pathology, University of Arkansas, Fayetteville, AR, U.S.A.; (2) Oregon State University, U.S.A.; (3) University of Arkansas, U.S.A.

1:15 p.m. • 96-S

Development of efficient diagnostic tools to enable rapid, easy-to-use, accurate and affordable detection of Rose rosette virus.

F. OCHOA-CORONA (1), A. A.M. Salazar Aguirre (2), S. Molina Cárdenas (2), A. Olmedo-Velarde (2), S. Dohal (3), J. Olson (1), B. Babu (4), M. Paret (4), (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador; (3) Kansas State University, Manhattan, KS, U.S.A.; (4) University of Florida, Quincy, FL, U.S.A.

1:30 p.m. • 97-S

Current state of knowledge on mite transmission and control.

R. Ochoa (1), G. Otero-Colina (2), J. Hammond (3), R. Jordan (3), G. Bauchan (1), (1) USDA, ARS, Beltsville, MD, U.S.A.; (2) Colegio de Postgraduados, Montecillo, Other, Mexico; (3) USDA, ARS, US National Arboretum, Beltsville, MD, U.S.A.

1:45 p.m. • 98-S

Monitoring and management of Rose rosette disease: Volunteer engagement.

K. ONG (1), (1) Dept Plant Pathology & Microbiology, Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.

2:00 p.m. • 99-S

Identification of sources of resistance and development of hybridization and genetic tools to move resistance into commercial cultivars.

D. BYRNE (1), P. Klein (2), M. Yan (2), E. Roundey (2), J. Lau (2), (1) Dept of Horticultural Sciences, Texas A&M University, College Station, TX, U.S.A.; (2) Horticultural Sciences, Texas A&M University, College Station, TX, U.S.A.

The Impact of Vector-Borne Bacteria Pathogen on Associated

1:00 - 4:00 p.m.; Room 22-23, CC

Organizers: Julien Levy and Ordom Huot, Texas A&M University, College Station, TX, U.S.A.

Moderators: Julien Levy and Ordom Huot, Texas A&M University, College Station, TX, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Vector-Pathogen Complexes Committee

1:00 p.m. • 100-S

How bacterial pathogens hijack cellular processes to turn plants into 'Zombies'.

S. HOGENHOUT (1), P. Pecher (1), (1) John Innes Centre, Norwich, United Kingdom

1:30 p.m. • 101-S

The impact of Time of Infection on Zebra Chip Symptom Development.

C. RUSH (1), F. Workneh (1), L. Paetzold (1), A. Rashed (2), (1) Texas A&M AgriLife Research, U.S.A.; (2) University of Idaho, U.S.A.

2:00 p.m. • 102-S

Genomic insights into citrus greening and its transmission.

D. GABRIEL (1), M. Jain (1), L. Fleites (1), (1) University of Florida, Gainesville, FL, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 103-S

The impact of '*Candidatus Liberibacter solanacearum*' and its insect vector on potato production in New Zealand.

A. PITMAN (1), J. Dohmen-Vereijssen (2), N. Agnew (2), P. Wright (2), F. Shah (2), S. Thompson (2), (1) The New Zealand Institute for Plant & Food Research, Lincoln, Canterbury, New Zealand; (2) The New Zealand Institute for Plant & Food Research, New Zealand

3:15 p.m. • 104-S

Reducing Hemipteran Vectors and pathogen spread, Topically applied RNAi.

W. HUNTER (1), E. Andrade (2), (1) USDA-ARS, Fort Pierce, FL, U.S.A.; (2) EMBRAPA, Cassava & Fruits, Cruz das Almas, Brazil

3:45 p.m. • Discussion

Promising Phenotyping Efforts for Understanding Genetic and Molecular Bases of Plant Disease Resistance

1:00 p.m. - 4:00 p.m.; Room 24-25, CC Livestream Session

Organizers: Yulin Jia, USDA ARS Dale Bumpers National Rice Research center, Stuttgart, AR, U.S.A.; James Kurle, University of Minnesota, St. Paul, MN, U.S.A.

Moderators: Yulin Jia, USDA ARS Dale Bumpers, National Rice Research Center, Stuttgart, AR, U.S.A.; James E. Kurle, University of Minnesota, St. Paul, MN, U.S.A.

Section: Biology and Disease Management

Sponsoring Committees/Sponsors: Host Resistance and Molecular and Cellular Phytopathology Committees

Financial Sponsor: The Samuel Roberts Noble Foundation

1:00 p.m. • 105-S

Molecular aspects of host pathogen interactions in common bacterial blight in *Phaseolus vulgaris* caused by *Xanthomonas*.
K. PAULS (1), W. Xie (1), T. Smith (1), G. Perry (1), E. Castro (1), (1) Department of Plant Agriculture, University of Guelph, Guelph, ON, Canada

1:30 p.m. • 106-S

Field-based high-throughput phenotyping for evaluation of barely yellow dwarf resistance in wheat breeding.
J. POLAND (1), X. Wang (2), D. Rotenberg (2), A. Laney (2), A. Whitfield (2), M. Ramos (2), A. Fritz (2), (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Kansas State University, U.S.A.

2:00 p.m. • 107-S

Unraveling the host-pathogen interaction via phenotyping and molecular characterization of resistance? Soybean as a case study.
S. CIANZIO (1), (1) Iowa State University, Ames, IA, U.S.A.

2:15 p.m. • 108-S

Field-based phenomics for stress detection: an overview.
R. DE LA TORRE-ROCHE (1), M. Newcomb (2), P. Andrade-Sanchez (3), J. White (4), (1) CT Agricultural Experiment Station, New Haven, CT, U.S.A.; (2) University of Arizona, Maricopa, AZ, U.S.A.; (3) Agricultural & Biosystems Engineering, University of Arizona, Maricopa, AZ, U.S.A.; (4) Arid-Land Agricultural Research Center, Maricopa, AZ, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 109-S

Development of controlled high throughput and user friendly assays for host responses to rice pathogen isolates.
Y. JIA (1), (1) USDA-ARS Dale Bumpers National Rice Research Center, Stuttgart, AR, U.S.A.

3:00 p.m. • 110-S

Phenotyping for resistance to viruses in maize.
M. REDINBAUGH (1), J. Zambrano (2), M. Jones (3), D. Francis (4), R. Louie (3), (1) USDA-ARS Corn, Soybean and Wheat Quality Research, Wooster, OH, U.S.A.; (2) INIAP, Quito, Ecuador; (3) USDA, ARS CSWQRU, Wooster, OH, U.S.A.; (4) Ohio State University, Wooster, OH, U.S.A.

3:30 p.m. • 111-S

Molecular mechanisms behind the HLB symptom variations and rapid selection for variant citrus plants with greater HLB resistance/tolerance.
Y. DUAN (1), M. Pitino (1), (1) USDA-ARS-USHRL, Fort Pierce, FL, U.S.A.

3:45 p.m. • Discussion

See the Unseen: Metatranscriptomics Unveils Plant- and Vector-Pathogen Interactions

2:45 - 4:00 p.m.; Room 16, CC

Organizers: Steve Klosterman, USDA ARS, Salinas, CA, U.S.A.; Lance Cadle-Davidson, USDA ARS, Geneva, NY, U.S.A.; Li-Jun Ma, University of Massachusetts, Amherst, MA, U.S.A.

Moderator: Melanie Filiatrault, Cornell University, Ithaca, NY, U.S.A.

Section: Molecular and Cellular Plant Microbe Interactions

Sponsoring Committees/Sponsors: Evolutionary Genetics and Genomics and Molecular Cellular Phytopathology Committees

2:45 p.m. • 112-S

Metatranscriptomics: Principles and Applications for Studying Plant-Pathogen Interactions.
L. GUO (1), L. Ma (2), R. Wick (2), K. Allen (2), K. Vescio (2), (1) University of Massachusetts, Amherst, Amherst, MA, U.S.A.; (2) University of Massachusetts, Amherst, U.S.A.

3:00 p.m. • 113-S

RNA-Seq unveils distinct interactions of whitefly with Tomato chlorosis virus and other viruses.
N. KAUR (1), D. Hasegawa (2), W. Chen (3), Y. Zheng (3), Z. Fei (3), K. Ling (4), W. Wintermantel (5), (1) USDA, Salinas, CA, U.S.A.; (2) Boyce Thompson Institute, Ithaca, NY 14853, USA; USDA-ARS, Salinas, CA, USA, U.S.A.; (3) Boyce Thompson Institute, Ithaca, NY 14853, USA, U.S.A.; (4) USDA-ARS, Charleston, SC, USA, U.S.A.; (5) USDA-ARS, Salinas, CA, USA, U.S.A.

3:15 p.m. • 114-S

Probing *Pseudomonas syringae* host interactions using metatranscriptomics.
M. FILIATRAULT (1), (1) USDA-ARS/Cornell University, Ithaca, NY, U.S.A.

3:30 p.m. • 115-S

Transcriptomics of a downy mildew-spinach interaction.
R. ORNELAS (1), S. Klosterman (2), S. Koike (3), A. Hulse-Kemp (4), L. Derevnina (4), R. Michelmore (4), S. Reyes-Chin-Wo (4), K. Stoffel (4), A. Van Deynze (4), (1) California State University at Monterey Bay, Monterey, CA, U.S.A.; (2) United States Department of Agriculture ARS, U.S.A.; (3) UC Cooperative Extension, U.S.A.; (4) University of California, Davis, U.S.A.

3:45 p.m. • 116-S

Transcriptome analysis of tanoak's mechanisms of innate and phosphite-induced resistance to *Phytophthora ramorum*.
K. HAYDEN (1), C. Eyre (2), P. Croucher (2), S. Schechter (2), J. Wright (3), M. Garbelotto (4), (1) Royal Botanic Garden Edinburgh, Edinburgh, United Kingdom; (2) University of California, Berkeley, Berkeley, CA, U.S.A.; (3) USDA Forest Service Pacific Southwest Research Station, U.S.A.; (4) University of California, Berkeley, U.S.A.

1:00 p.m. Technical Sessions

Effector Biology

1:00 - 2:15 p.m.; Room 20-21, CC

Moderators: Angelyn Hilton, Texas A&M University, College Station, TX, U.S.A.; Lindsay Triplett, Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.

1:00 p.m. • 105-O

Degradation of the master regulator of plant defense NPR1 by the type III effector HopAB2.
Z. FU (1), H. Chen (1), J. Chen (2), Z. Shang (1), M. Li (1), F. Liu (3), (1) University of South Carolina, Columbia, SC, U.S.A.; (2) Institute of Plant Protection, Jiangsu Academy of Agricultural Sciences, Nanjing, Other, China; (3) Institute of Plant Protection, Jiangsu Academy of Agricultural Sciences, Nanjing, China

1:15 p.m. • 106-O

Ralstonia solanacearum effector RipAA host target and the effect of intron spliced hairpin RNA silencing on host susceptibility.
A. KHAN (1), A. Khan (1), G. Ali (1), D. Norman (1), (1) University of Florida, U.S.A.; (2) University of Florida, Apopka, FL, U.S.A.; (3) University of Florida, Ap, FL, U.S.A.

1:30 p.m. • 107-O

Resistance of Carolina Gold Select rice to African strains of *Xanthomonas oryzae* pv. *oryzicola* is triggered by inactivated TAL effectors.
L. TRIPLETT (1), S. Cohen (2), C. Heffelfinger (3), A. Bogdanove (4), J. Leach (2), (1) The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.; (2) Colorado State University, U.S.A.; (3) Yale University, U.S.A.; (4) Cornell University, Ithaca, NY, U.S.A.; (5) Colorado State University, Fort Collins, CO, U.S.A.

1:45 p.m. • 108-O

Xanthomonas effector kinase XopAU promotes disease symptoms by activation of host MAPKK.
D. TEPER (1), E. Bosis (1), G. Popov (1), A. Girija (1), G. Sessa (2), (1) Department of Molecular Biology and Ecology of Plants, Tel Aviv University, Tel Aviv, Israel; (2) Department of Molecular Biology and Ecology of Plants, Tel Aviv University, Israel

2:00 p.m. • 109-O

Dissecting the function and downstream targets of *CsLOB1* in citrus.

S. DUAN (1), H. Jia (1), S. Gowda (1), N. Wang (1), (1) Citrus research and education center, Lake Alfred, FL, U.S.A.

Pathogen Dispersal

1:00 - 2:15 p.m.; Room 15, CC

Moderators: Rodrigo Onofre, University of Florida, Gainesville, FL, U.S.A.; Sridhara Kunjeti, University of California, Davis, CA, U.S.A.

1:00 p.m. • 110-O

Trapping conidia spores of *Podosphaera aphanis* in high tunnels and field strawberry plots.

R. ONOFRE (1), D. Gadoury (2), N. Dufault (1), N. Peres (1), (1) UNIVERSITY OF FLORIDA, GAINESVILLE, FL, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.

1:15 p.m. • 111-O

Detection and quantification of *Bremia lactucae* by spore trapping and quantitative PCR.

S. KUNJETI (1), A. Anchietà (2), F. Martin (3), Y. Choi (4), M. Thines (5), R. Mitchelmore (1), S. Koike (6), C. Tsuchida (1), W. Mahaffee (7), K. Subbarao (1), S. Klosterman (3), (1) University of California Davis, U.S.A.; (2) USDA Salinas, Salinas, CA, U.S.A.; (3) USDA-ARS, Salinas, CA, U.S.A.; (4) Korea University, Division of Environmental Sciences and Ecological Engineering, Seoul 136-701, Korea; (5) Biodiversity and Climate Research Center (BiK-F), Germany; (6) University of California Cooperative Extension, Monterey County, Salinas, U.S.A.; (7) USDA-ARS, U.S.A.; (8) University of California Davis, Salinas, CA, U.S.A.

1:30 p.m. • 112-O

Timing of primary inoculum release by *Monilinia vaccinii-corymbosi* infecting blueberries in the US Pacific Northwest.

D. HARTEVELD (1), T. Peever (2), J. Pscheidt (3), (1) Washington State University, Mount Vernon, WA, U.S.A.; (2) Washington State University, WA, U.S.A.; (3) Oregon State University, U.S.A.

1:45 p.m. • 113-O

Plant pathogens were collected over Florida up to 3500 m by a wing-mounted dust collection system called DART (Dust Atmospheric Recovery Technology).

A. SCHUERGER (1), B. Tench (2), T. Emmons (3), J. Palaia (4), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Dept. of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (3) Dept. of Engineering, Univ. of Central Florida, Orlando, FL, U.S.A.; (4) 4Frontiers Corporation, St. Petersburg, FL, U.S.A.

2:00 p.m. • 114-O

Validation of the CDM ipmPIPE Forecasting System: Relating Aerial Transport of Pathogen Spores to Outbreaks of Cucurbit Downy Mildew.

K. NEUFELD (1), A. Keinath (2), B. Dutta (3), B. Gugino (4), D. Langston (5), M. Lewis Ivey (6), M. McGrath (7), S. Miller (8), E. Sikora (9), P. Ojiambo (1), (1) Department of Plant Pathology, North Carolina State University, Raleigh, NC, U.S.A.; (2) Clemson University, Charleston, SC, U.S.A.; (3) Department of Plant Pathology, University of Georgia, Tifton, GA, U.S.A.; (4) Department of Plant Pathology and Environmental Microbiology, Pennsylvania State University, University Park, PA, U.S.A.; (5) Virginia Polytechnic Institute and State University, Suffolk, VA, U.S.A.; (6) Department of Plant Pathology and Crop Physiology, Louisiana State University, Baton Rouge, LA, U.S.A.; (7) Plant Pathology and Plant-Microbe Biology, SIPS, Cornell University, Riverhead, NY, U.S.A.; (8) Department of Plant Pathology, Ohio State University, Wooster, OH, U.S.A.; (9) Department of Entomology and Plant Pathology, Auburn University, Auburn University, AL, U.S.A.

2:45 p.m. Technical Sessions

Isothermal Pathogen Detection

2:45 - 4:00 p.m.; Room 20-21, CC

Moderators: Alfredo Diaz-Lara, Oregon State University, Corvallis, OR, U.S.A.; Francesca Peduto Hand, The Ohio State University, Columbus, OH, U.S.A.

2:45 p.m. • 115-O

Rapid LAMP diagnostics for detection and disease alerts of *Phytophthora infestans*.

J. RISTAINO (1), A. Saville (1), R. Guenter (1), C. Lagaly (1), D. Cooper (2), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Mobile Assay, Boulder, CO, U.S.A.

3:00 p.m. • 116-O

LAMP lights the way: early detection of airborne inoculum of *Magnaporthe oryzae* in turfgrass fields.

F. PEDUTO HAND (1), F. Peduto Hand (1), C. Villari (1), W. Mahaffee (2), T. Mitchell (1), (1) The Ohio State University, Columbus, OH, U.S.A.; (2) USDA-ARS, Corvallis, OR, U.S.A.

3:15 p.m. • 117-O

Detection of the select agent *Rathayibacter toxicus* using recombinase polymerase amplification coupled with a lateral flow device.

M. ARIF (1), G. Busot (2), R. Mann (3), B. Rodoni (4), J. Stack (5), (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (2) Department of Plant Pathology, Kansas State University, Manhattan, KS, Australia; (3) Department of Economic Development, Jobs, Transport and Resources, Latrobe University, Manhattan, KS, U.S.A.; (4) Department of Economic Development, Jobs, Transport and Resources, Latrobe University, Bundoora, Australia; (5) Department of Plant Pathology, Kansas State University, Australia

3:30 p.m. • 118-O

Development of a rapid AmplifyRP Acceler8 test for grapevine red blotch-associated virus in grapevines.

R. LI (1), M. Fuchs (2), K. Perry (3), T. Mekuria (4), S. Zhang (1), (1) Agdia Inc., U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.; (3) Cornell University, Ithaca, NY, U.S.A.; (4) Vintage Nurseries, Wasco, CA, U.S.A.; (5) Agdia Inc., Elkhart, IN, U.S.A.

3:45 p.m. • 119-O

An Integrated Microfluidic Device for Rapid Plum Pox Virus Enrichment and Detection.

S. ZHENG (1), Y. Yeh (1), V. Mavrodieva (2), W. Zhang (1), Z. Liu (2), (1) The Pennsylvania State University, U.S.A.; (2) USDA, APHIS, PPQ, CPHST-Beltsville Laboratory, U.S.A.

Mycotoxins

2:45 - 4:00 p.m.; Room 15, CC

Moderators: Jake Fountain, University of Georgia, Athens, GA, U.S.A.; Subbaiah Chalivendra, Louisiana State University, Baton Rouge, LA, U.S.A.

2:45 p.m. • 120-O

Aspergillus communities contaminating red chilies with aflatoxins.

P. SINGH (1), P. Cotty (1), (1) University of Arizona, Tucson, AZ, U.S.A.

3:00 p.m. • 121-O

Diversity of the *Aspergillus* section *Flavi* S morphotype in Mozambique.

L. ARONE (1), J. Augusto (2), R. Bandyopadhyay (3), P. Cotty (4), (1) University of Arizona, Tucson, AZ, U.S.A.; (2) International Institute of Tropical Agriculture (IITA), Nampula, Other, Mozambique; (3) International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria; (4) Agricultural Research Service, USDA and School of Plant Sciences, University of Arizona, Tucson, AZ, U.S.A.

3:15 p.m. • 122-O

RNAseq analysis reveals oxidative stress responses of *Aspergillus flavus* are related to stress tolerance and aflatoxin production.

J. FOUNTAIN (1), P. Bajaj (2), L. Yang (3), M. Pandey (2), S. Nayak (2), V. Kumar (2), A. Jayale (2), A. Chitikineni (2), S. Chen (4), R. Lee (3), B. Scully (5), R. Kemerait (3), 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 (ICRISAT), India; (3) University of Georgia, U.S.A.; (4) University of Florida, U.S.A.; (5) USDA-ARS, U.S.A.

3:30 p.m. • 123-O

Hypoxia tolerance as a factor in *Aspergillus flavus* invasion and toxin contamination of developing maize seeds.

S. CHALIVENDRA (1), C. DeRobertis (2), K. Damann (1), (1) Louisiana State University, Baton Rouge, LA, U.S.A.; (2) Louisiana State University, Baton Rouge, LA, U.S.A.

3:45 p.m. • 124-O

Relationship between invasive brown marmorated stink bug and fumonisin contamination of field corn in the Mid-Atlantic.

J. OPOKU (1), H. Mehl (2), N. Kleczewski (3), (1) VIRGINIA TECH TAREC, SUFFOLK, VA, U.S.A.; (2) Virginia Tech Tidewater AREC, Suffolk, VA, U.S.A.; (3) University of Delaware, Newark, DE, U.S.A.

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POSTER VIEWING HOURS

***poster huddles as subject to change**

Sunday, July 31

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

Monday, August 1

10:00 a.m. – 6:00 p.m. Poster Viewing
2:30 – 3:00 p.m. Poster Huddles*

HUDDLE #1 – Is globalization of agriculture contributing to the emergence of plant virus diseases?

Moderator: Akhtar Ali, Vice moderator: Tera Pitman

HUDDLE #2 – Vector transmission of plant viruses – is it simple or complex?

Moderator: Jessica Brown, Vice moderator: Matt Ramos

HUDDLE #3 – How to safeguard US agriculture from pests and diseases?

Moderator: Jorge Abad, Vice moderator: Kevin Ong

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 poster number where you can be found.

3:00 – 4:00 p.m. Posters 1 – 400 (even-numbered posters)

4:00 – 5:00 p.m. Posters 400 – 804 (even-numbered posters)

Tuesday, August 2

8:00 a.m. – 6:00 p.m. Poster Viewing
3:00 – 3:30 p.m. Poster Huddles*

HUDDLE #4 – What are the differences between natural products and synthetic pesticides for disease control in terms of development, regulation, and efficacy?

Moderator: Katherine Buxton, Vice moderator: Kim Gwinn

HUDDLE #5 – What makes an effective biocontrol agent?

Moderator: Ghazal Ebadzadsabirai, Vice moderator: Marian Lund

HUDDLE #6: What are metabolomic and other global chemical analyses teaching us about host resistance and susceptibility?

Moderator: Marta Lima, Vice moderator: Rachid Lahlali

3:30 – 5:30 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 poster number where you can be found.

3:30 – 4:30 p.m. Posters 1 – 400 (odd-numbered posters)

4:30 – 5:30 p.m. Posters 400 – 804 (odd-numbered posters)

Wednesday, August 3

8:30 – 10:00 p.m. Poster Viewing
8:30 – 9:00 a.m. Poster Huddles*

HUDDLE #7: What are the best approaches to identifying and characterizing virulence factors from diverse pathogens?

Moderator: Tiago De Paula Lelis, Vice moderator: Diana Fernandez

HUDDLE #8: What commonalities exist between host resistance and susceptibility?

Moderator: Chellapan Padmabhan, Vice moderator: Sara Allen

HUDDLE #9 – Why the resistance? Challenges to managing fungicide resistance.

Moderator: Mengjun Hu, Vice moderator: Scott Cosseboom

10:00 – 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

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NOTE: Content appears as submitted and has not been edited

Poster Categories	Poster Numbers	Poster Categories	Poster Numbers
Bacteriology	1-27	Climate Change	607-615
Mycology	28-74	Cropping Systems/Sustainability	616-618
Nematology	75-86	Pathogen Dispersal	619-634
Oomycetes	87-98	Pathogen-Vector Interactions	635-648
Virology	99-117	Population Biology Genetics	649-669
Postharvest Pathology and Mycotoxins	118-139	Risk Assessment	670-684
Biological Control	140-206	Systematics/Evolution	685-687
Chemical Control	207-301	Biochemistry and Cell Biology	688-699
Cultural Control	302-322	Biotechnology	700-706
Genetics of Resistance	323-387	Molecular Plant-Microbe Interactions	707-759
Integrated Pest Management	388-419	Plant Defense Responses	760-772
Regulatory Plant Pathology	420-426	Proteomics/Metabolomics/Genomics	773-798
Crop Loss Assessment	427-433	Outreach and Engagement	799-802
Disease Detection and Diagnosis	434-548	Professional Development	803
New and Emerging Diseases	549-601	Teaching and Learning	804
Analytical and Theoretical Plant Pathology	602-606		

Bacteriology

- 1-P Exploration of biofilm formation and its potential link to virulence in the Goss's wilt pathogen *Clavibacter michiganensis* subspecies *nebraskensis***
M. BOTTI-MARINO (1), M. Botti-Marino (1), J. Jacobs (1), M. Chilvers (1), G. Sundin (1), (1) Michigan State University, Lansing, MI, U.S.A.
- 2-P The negative regulatory function of *tepR* for the virulence of *Burkholderia glumae* in rice is exerted via the quorum-sensing master regulator gene *qsmR***
J. HAM (1), J. Peng (1), (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.
- 3-P Functional Analysis of MiaA, the tRNA Modification Enzyme in the Biological Control Strain *Pseudomonas chlororaphis* 30-84**
E. PIERSON (1), J. Yu (2), D. Wang (3), L. Pierson (1) (1) Department of Plant Pathology and Microbiology, Texas A&M university, College Station, TX, U.S.A.; (2) Department of Horticultural Sciences, Texas A&M university, College Station, TX, U.S.A.; (3) Earth and Environmental Sciences, Los Alamos National Laboratory, Los Alamos, NM, U.S.A.
- 4-P Research on Bacterial Endophytes at the Institute for Advanced Learning and Research**
C. MEI (1), R. Chretien (2), J. Carey (2), Y. He (2), S. Kadali (2), S. Lowman (2), (1) Institute for Advanced Learning and Research, Danville, VA, U.S.A.; (2) Institute for Advanced Learning and Research, U.S.A.
- 5-P Genome analysis of *Rathayibacter toxicus* strain WAC3373 from Western Australia: sequencing, assembly and annotation**
M. ARIF (1), G. Busot (1), R. Mann (2), B. Rodoni (2), S. Liu (1), J. Stack (1), (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (2) Department of Economic Development, Jobs, Transport and Resources, Latrobe University, Bundoora, Australia
- 6-P Tomato Bacterial Wilt Management Trials in Leyte Philippines**
L. BORINES (1), R. Sagarino (1), G. Rogers (2), S McDougall (3), Z. Gonzaga (4), L Tesoriero (3) (1) Department of Pest Management, Visayas State University, Philippines; (2) Applied Horticultural Research, Australia; (3) Department of Primary Industries, Australia; (4) Department of Horticulture, Visayas State University, Philippines
- 7-P Effect of biofertilizer applications on bacterial communities in the rhizosphere of citrus affected by huanglongbing**
J. LI (1), Y. Zhang (2), L. Li (3), U. Handique (2), N. Wang (3), (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Florida, FL, U.S.A.; (3) University of Florida, U.S.A.

- 8-P Impacts of abundance of *Candidatus Liberibacter* on the citrus phyto-microbiome**
R. BLAUSTEIN (1), J. Meyer (1), A. Conesa (2), G. Lorca (2), M. Teplitski (1), (1) Soil and Water Science Department, University of Florida, Gainesville, FL, U.S.A.; (2) Microbiology and Cell Science Department, University of Florida, Gainesville, FL, U.S.A.
- 9-P Quick genome sequencing of "Candidatus Liberibacter" strains by use of Enrichment-Enlargement-Next generation sequencing (EEN)**
J. CHEN (1), Z. Zheng (2), F. Wu (3), X. Deng (3), (1) USDA-ARS, Parlier, CA, U.S.A.; (2) South China Agricultural University, Guangzhou, China; (3) South China Agricultural University, China
- 10-P Phenotypic effects of anti-*Candidatus Liberibacter asiaticus* antibody expression in grapefruit**
T. MCNELLIS (1), T. Gottwald (2), J. Sinn (1), V. Orbovic (3), (1) Penn State University, U.S.A.; (2) USDA ARS, U.S.A.; (3) CREC-University of Florida, U.S.A.
- 11-P WITHDRAWN**
- 12-P Modification of chemically defined medium XF-26 for in-vitro cultivation of *Xylella fastidiosa* and *Xylella taiwanensis* isolated in Taiwan**
W. DENG (1), N. Sharma (1), S. Hsu (1), C. Su (2), C. Chang (3), Y. Tseng (1), F. Jan (1), (1) National Chung Hsing University, Taichung, Taiwan; (2) Taiwan Agricultural Chemicals and Toxic Substances Research Institute, Taichung, Taiwan; (3) University of Georgia, Griffin, GA, U.S.A.
- 13-P Virulence traits and disease development by *Xylella fastidiosa* are impaired in a mutant on the outer membrane protein MopB**
H. CHEN (1), P. Kandel (1), L. Cruz (1), L. De La Fuente (1), (1) Auburn university, U.S.A.
- 14-P Insights from comparative analyses between the genomes of two model strains of the cucurbit pathogenic bacterium *Acidovorax citrulli***
S. BURDMAN (1), N. Eckshtain-Levi (2), D. Shkedy (3), M. Gershovits (3), G. Mateus da Silva (4), D. Tamir-Ariel (1), R. Walcott (4), T. Pupko (3), (1) The Hebrew University of Jerusalem, Rehovot, Israel; (2) The Hebrew University of Jerusalem, Rehovot, Israel; (3) Tel Aviv University, Tel Aviv, Israel; (4) University of Georgia, Athens, GA, U.S.A.
- 15-P Evaluation of assembling methods on determination of whole genome sequence of *Xylella fastidiosa* blueberry bacterial leaf scorch strain**
J. CHEN (1), C. Wallis (1), C. Chang (2), (1) USDA-ARS, U.S.A.; (2) University of Georgia, U.S.A.

- 16-P Bacterial Communities in Cultivated and Wild Cranberry Bogs**
S. SOBY (1), G. Ebadzad (1), E. Batory (1), (1) Midwestern University, Glendale, AZ, U.S.A.
- 17-P Host range potential of bacterial soft rot pathogens isolated from *Phalaenopsis* and *Oncidium* orchids**
R. CATING (1), B. Robinson (1), A. Palmateer (2), K. Frost (3), (1) Oregon State University, Hermiston, OR, U.S.A.; (2) University of Florida, Homestead, FL, U.S.A.; (3) Oregon State University, Hermiston, FL, U.S.A.
- 18-P Bacteriophages: the over-looked component of the phyllosphere of *Xanthomonas*-diseased plants**
D. RITCHIE (1), M. Munster (2), S. Butler (2), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) North Carolina State University and Plant Disease & Insect Clinic, Raleigh, NC, U.S.A.
- 19-P Comparative genomic analyses of 15 *Acidovorax* pathogens provide insights into the emergence of a new turfgrass disease and the host specificity**
Q. ZENG (1), J. Wang (2), P. Giordano (3), F. Bertels (4), M. Chilvers (5), J. Vargas (5), G. Sundin (5), N. Mitkowski (6), (1) The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.; (2) Michigan State Univ, U.S.A.; (3) Bayer Corporation, Canada; (4) University of Basel, Switzerland; (5) Michigan State University, U.S.A.; (6) URI, U.S.A.
- 20-P Epiphytic survival of *Pantoea ananatis* on Florida Pusley (*Richardia scabra* L.)**
B. DUTTA (1), R. Gitaitis (1), F. Anderson (1), (1) the university of georgia, tifton, GA, U.S.A.
- 21-P Further evidence for host preference among *Acidovorax citrulli* strains based on a detached melon fruit assay**
L. YAN (1), R. Walcott (2), B. Hu (1), (1) Nanjing Agricultural University, China; (2) University of Georgia, U.S.A.
- 22-P WITHDRAWN**
- 23-P WITHDRAWN**
- 24-P Characterization and Management of *Ralstonia solanacearum* Causing Bacterial Wilt of Tomato in Louisiana**
A. JIMENEZ MADRID (1), A. Jimenez (1), M. Lewis Ivey (1), (1) Louisiana State University, Baton Rouge, LA, U.S.A.
- 25-P Development of green fluorescent protein-expressing *Xanthomonas gardneri* strains to study tomato infection processes**
F. ROTONDO (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 26-P Improvement of the environmental DNA extraction method for profiling the culturable microbiome of bacterial wilt-conductive and non-conductive soils**
R. GICANA (1), W. Deng (1), J. Wu (1), (1) National Chung Hsing University, Taichung, Taiwan
- 27-P WITHDRAWN**
- 31-P Understanding sexual fertility in *Aspergillus flavus* through analysis of F1 progeny**
R. GELL (1), I. Carbone (1), (1) Center for Integrated Fungal Research, North Carolina State University, Raleigh, NC, U.S.A.
- 32-P Progress on genomic analysis and taxonomy of the rice blast fungus (*Pyricularia oryzae*) and other Magnaporthales specie**
N. ZHANG (1), G. Cai (2), D. Bhattacharya (3), J. Luo (3), H. Qiu (3), (1) Rutgers University, New Brunswick, NJ, U.S.A.; (2) USDA, ARS, U.S.A.; (3) Rutgers University, U.S.A.
- 33-P Anything But Barren: Fungal Diversity and Functions in the Pine Barrens**
N. ZHANG (1), J. Luo (2), S. Miller (2), E. Walsh (2), S. Bonos (2), Z. Helsel (2), (1) Rutgers University, New Brunswick, NJ, U.S.A.; (2) Rutgers Univ, U.S.A.
- 34-P Improved plant-based culture media for growth and sporulation of *Cercospora janseana***
S. UPPALA (1), B. Liu (2), M. Wu (2), L. Zhou (3), X. Zhou (4), (1) Texas A & M AgriLife Research Center, Beaumont, TX, U.S.A.; (2) Hunan Agricultural University, Changsha, Hunan, China; (3) Texas A&M AgriLife Research, Beaumont, TX, U.S.A.; (4) Texas A&M AgriLife Research Center, Beaumont, TX, U.S.A.
- 35-P Virulence of *Rhizoctonia solani* anastomosis groups on cotton, corn, rice and soybean**
K. URREA (1), C. Rothrock (1), S. Winters (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.
- 36-P WITHDRAWN**
- 37-P Identity, characteristics, and fungicide sensitivity of isolates in the *Diaporthe* species complex associated with soybean stem disease in Minnesota**
D. MALVICK (1), C. Floyd (2), (1) University of Minnesota, St. Paul, MN, U.S.A.; (2) University of Minnesota, St Paul, MN, U.S.A.
- 38-P Standardizing water potential of salt-amended growth media at different temperatures for microbiological studies**
I. AUJLA (1), T. Paulitz (2), (1) Department of Plant Pathology, Washington State University, Pullman, WA, U.S.A.; (2) USDA-ARS, Washington State University, Pullman, WA, U.S.A.
- 39-P Ascospore biology of *Parastagonospora nodorum* under Norwegian field conditions**
A. FICKE (1), B. Asalf (2), A. Ruud (3), (1) Norwegian Institute for Bioeconomic Research, Aas, Norway; (2) Norwegian Institute of Bioeconomy Research, Aas, Norway; (3) Norwegian University of Life Sciences, Aas, Norway
- 40-P Distribution, pathogenicity, morphology and molecular diversity of *Bipolaris sorokiniana* isolates from Turkey**
B. TUNALI (1), D. Sariaslan (2), B. Kansu (3), (1) Ondokuz Mayıs University Agricultural Faculty Department of Plant Protection, Atakum Samsun, Turkey; (2) Ondokuz Mayıs University, Atakum Samsun, Turkey; (3) Ondokuz Mayıs University, Vocational School Plant and Animal Production Department, Atakum Samsun, Turkey
- 41-P Evaluation of chemotype, pathogenicity, and aggressiveness of *Fusarium graminearum* isolates of wheat and soybean**
B. MUELLER (1), B. Mueller (1), C. Groves (1), D. Mueller (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.
- 42-P Pathogenicity and Virulence of *Alternaria alternata* on 'Alamo' Switchgrass**
S. COLLINS (1), B. Ownley (1), (1) University of Tennessee, U.S.A.
- 43-P Genetic characterization of the *Colletotrichum gloeosporioides* complex in apple orchards of North Carolina**
B. HOGE (1), M. Cubeta (1), D. Ritchie (1), (1) North Carolina State University, Raleigh, NC, U.S.A.
- 44-P Fitness ability and fungicide sensitivity of *Lambertella corni-marit* isolates from apple**
A. AMIRI (1), A. Hawkins (2), K. Mulvaney (2), (1) Washinton State

Mycology

- 28-P Introduction and seed transmission of *Fusarium proliferatum* in the field**
A. REYES GAIGE (1), W. Yue (2), C. Toomajian (2), J. Stack (2), (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Kansas State University, U.S.A.
- 29-P Genetic mapping of pathogenesis in the northern corn leaf blight fungus**
S. MIDEROS (1), C. Chung (2), J. Poland (3), G. Turgeon (4), R. Nelson (4), (1) University of Illinois at Urbana Champaign, Urbana, IL, U.S.A.; (2) National Taiwan University, Taiwan; (3) Kansas State University, U.S.A.; (4) Cornell University, U.S.A.
- 30-P Characterizing *Fusarium* species infecting corn roots in South Dakota**
A. ADHIKARI (1), P. Okello (1), B. Kontz (1), M. Dunbar (1), A. Varenhorst (2), F. Mathew (2), (1) South Dakota State University, Brookings, SD, U.S.A.; (2) South Dakota State University, U.S.A.

University, Wenatchee, WA, U.S.A.; (2) Washington State University, Wenatchee, WA, U.S.A.

- 45-P Nutritional and environmental effects on conidial germination and appressorium formation of *Phyllosticta citricarpa*, the citrus black spot pathogen**
J. PALUMBO (1), T. O'Keeffe (1), M. Fidelibus (2), (1) USDA ARS, Albany, CA, U.S.A.; (2) University of California, U.S.A.
- 46-P Host colonization and substrate utilization by wood-colonizing Ascomycete fungi in the grapevine trunk disease complex**
J. HAMMOND (1), M. Reinsel (1), (1) USDA-ARS, USNA, Floral and Nursery Plants Research Unit, Beltsville, MD, U.S.A.
- 47-P Virulence of *Botrytis prunorum* associated with blossom blight on Japanese plum in Chile**
E. FERRADA (1), B. Latorre (1), J. Zoffoli (1), G. Diaz (2), (1) Pontificia Universidad Católica de Chile, Santiago, Chile; (2) Universidad de Talca, Chile
- 48-P Modelling potential inoculum availability of *Mycosphaerella nawae* in persimmon leaf litter using Bayesian growth curves**
A. VICENT (1), J. Martínez-Minaya (2), A. López-Quílez (3), D. Conesa (3), (1) Instituto Valenciano de Investigaciones Agrarias (IVIA), Moncada 46113, Valencia, Spain., Valencia, Spain; (2) Instituto Valenciano de Investigaciones Agrarias (IVIA), Moncada 46113, Valencia, Spain., Valencia, Spain; (3) Departament d'Estadística i Investigació Operativa, Universitat de València, Burjassot 46100, Valencia, Spain., Valencia, Spain
- 49-P Factors affecting germination of pseudosclerotia of *Monilinia vaccinii-corymbosi* on lowbush blueberry.**
T. CASE (1), S. Annis (1), (1) University of Maine, Orono, ME, U.S.A.
- 50-P Relationship between genetic and morphological characters of *Botrytis cinerea* isolates obtained of blueberry fields in southern Chile**
E. BRICEÑO (1), E. Briceño (1), S. Aguirre (2), A. Behn (2), (1) Universidad Austral de Chile, Valdivia, Chile; (2) Univ austral Chile, Valdivia, Chile
- 51-P Mining of abiotic and biotic factors for prediction of soybean sudden death syndrome (SDS) symptoms**
Z. NOEL (1), M. Roth (1), J. Wang (1), E. Papenfuss (1), D. Kramer (1), M. Chilvers (1), (1) Michigan State University, U.S.A.
- 52-P Effects of inoculum substrates on root rot of soybean caused by *Fusarium oxysporum* and *Fusarium graminearum***
D. CRUZ (1), D. Mayfield (2), Y. Meng (1), G. Munkvold (1), L. Leandro (1), (1) Iowa State University, Ames, IA, U.S.A.; (2) Iowas State University, Ames, IA, U.S.A.
- 53-P Preliminary results from Multilocus Sequence Typing of the soilborne fungal pathogen *Sclerotium rolfsii***
P. SORIA (1), M. Smith (1), N. Dufault (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 54-P A real-time PCR and digital droplet PCR assay for quantification of *Polymyxa betae* in sugar beet roots**
B. SMITH (1), F. Martin (1), (1) USDA-ARS, Salinas, CA, U.S.A.
- 55-P Ray blight disease (*Stagonosporopsis tanacetii*) development in pyrethrum**
M. BHUIYAN (1), T. Groom (2), M. Nicolas (3), P. Taylor (3), (1) The University of Melbourne, Other, Australia; (2) Botanical Resources Australia, Australia; (3) The University of Melbourne, Australia
- 56-P Identifying Diversity Within *Corynespora cassicola*, Cause of Target Spot of Cotton, Tomato, and Soybean in the Southeastern U.S.**
L. SUMABAT (1), M. Brewer (1), R. Kemerait (2), (1) University of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Tifton, GA, U.S.A.
- 57-P Oxygen and an aerial state are independently required for asexual development of *Aspergillus* species**
M. CHI (1), K. Craven (2), (1) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.; (2) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.
- 58-P Current Status and Ongoing Conservation Efforts for the Federally Endangered Species *Pityopsis ruthii***
T. EDWARDS (1), P. Wadl (2), R. Trigiano (3), E. Hatmaker (3), S. Boggess (3), P. Moore (1), M. Staton (5), W. Klingeman (1), E. Bernard (1), A. Dattilo (6), B. Ownley (1), T. Rinehart (7), M. Pistrang (8), J. Skinner (1), G. Call (9), A. Windham (1), D. Hadziabdic (1), (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) United States Department of Agriculture, Agricultural Research Service, Charleston, SC, U.S.A.; (3) University of Tennessee, U.S.A.; (4) University of Tennessee, Knoxville, U.S.A.; (5) University of Tennessee, Knoxville, TN, U.S.A.; (6) Tennessee Valley Authority, Knoxville, TN, U.S.A.; (7) United States Department of Agriculture, Agricultural Research Service, Poplarville, MS, U.S.A.; (8) United States Department of Agriculture, Forest Service, Cleveland, TN, U.S.A.; (9) United States Fish and Wildlife Service, Cookeville, TN, U.S.A.
- 59-P Genome sequencing of *Synchytrium endobioticum* offers insight into its carbohydrate degrading enzymes and effectors**
H. NGUYEN (1), B. van de Vossenber (2), T. van der Lee (2), D. Joly (3), D. Smith (4), M. van Gent-Pelzer (2), P. Bonants (2), C. Levesque (1), (1) Agriculture and Agri-Food Canada, Ottawa, ON, Canada; (2) Wageningen University and Research Centre, Netherlands; (3) University of Moncton, Moncton, NB, Canada; (4) Canadian Food Inspection Agency, Canada
- 60-P Origin and consequence of myrtle rust (*Puccinia psidii*) in the New Caledonian biodiversity hotspot.**
S. JULIA (1), M. Laurent (2), C. Fabian (1), (1) Institut Agronomique Néocalédonien, Noumea, New Caledonia; (2) CIRAD (Centre de coopération internationale en recherche agronomique pour le développement), Nouméa, New Caledonia
- 61-P Development of a multiplex PCR microsatellite marker set for *Raffaelea lauricola*, and its potential applications**
T. DREADEN (1), M. Hughes (2), J. Smith (2), (1) USDA FS, U.S.A.; (2) University of Florida, U.S.A.
- 62-P Genome and transcriptome analysis of *Phellinus noxius*, a wood decay fungus**
H. LEE (1), C. Chen (2), I. Tsai (3), R. Liou (2), C. Chung (2), (1) National Taiwan University, Taipei, Taiwan; (2) National Taiwan University, Taiwan; (3) Academia Sinica, Taiwan
- 63-P Ganoderma Species Associated with Declining or Dead Trees in the Southeastern United States**
A. LOYD (1), J. Smith (2), R. Blanchette (3), B. Held (3), C. Barnes (4), N. Dollinger (5), M. Schink (6), (1) Bartlett Tree Experts/University of Florida, U.S.A.; (2) University of Florida, U.S.A.; (3) University of Minnesota, U.S.A.; (4) Departamento Nacional de Protección Vegetal, INAP, Ecuador; (5) State College of Florida, U.S.A.; (6) Self, Port Crane, NY, U.S.A.
- 64-P Progress of severity of brown rust and orange rust during two sugarcane crop seasons in Florida**
S. SANJEL (1), M. Hincapie (1), B. Chaulagain (1), J. Comstock (2), R. Raid (1), P. Rott (1), (1) University of Florida, Belle Glade, FL, U.S.A.; (2) USDA-ARS, Canal Point, FL, U.S.A.
- 65-P Host specificity of *Colletotrichum* sp. on tree tomato (*Solanum betaceum*) and mango (*Mangifera indica*) crops**
S. RESTREPO (1), L. Cabrera-Villamizar (1), C. pardo (1), S. Rojas (1), P. Rojas (1), G. Danies (1), P. Jiménez (2), (1) Universidad de los Andes, Colombia; (2) Universidad Militar Nueva Granada, Colombia
- 66-P Arbuscular mycorrhizal fungal communities associated with organic and conventional onion crops in the Columbia Basin of Washington**
L. DU TOIT (1), A. Knerr (2), D. Wheeler (2), D. Schlatter (3), (1) Washington State University, Mount Vernon, WA, U.S.A.; (2) Washington State University, Pullman, WA, U.S.A.; (3) USDA ARS, Pullman, WA, U.S.A.
- 67-P Development of a split-root technique for canola (*Brassica napus* L.)**
N. NOËL (1), L. Quesada-Ocampo (1), (1) NCSU, Raleigh, NC, U.S.A.
- 68-P Determining infection courts for *Fusarium oxysporum* f. sp. *niveum* leading to watermelon seed infestation**
A. PETKAR (1), P. Ji (1), (1) University of Georgia, Tifton, GA, U.S.A.
- 69-P Evaluating isolate aggressiveness of *Fusarium oxysporum* f.sp. *niveum* in Florida**
T. SANCHEZ (1), (1) University of Florida, Gainesville, FL, U.S.A.

- 70-P Characterization of fungi associated with tomato leaf mold in the United States**
L. GARBER (1), N. LeBlanc (2), A. Orshinsky (1), C. Smart (3), (1) University of Minnesota, St. Paul, MN, U.S.A.; (2) University of Minnesota, U.S.A.; (3) Cornell University, Geneva, NY, U.S.A.
- 71-P Mitochondrial and nuclear gene sequences to infer the phylogeny of Pezizomycotina (Ascomycota)**
P. BALATTI (1), E. Balatti (1), S. Lpez (1), M. Saparrat (2), (1) Facultad de Ciencias Agrarias y Forestales, La Plata, Argentina; (2) Facultad de Ciencias Agrarias y Forestales, La Plata, Argentina
- 72-P In silico screening of genes coding for secondary metabolites in the phytopathogenic fungus *Stemphylium lycopersici***
P. BALATTI (1), E. Franco (2), S. Lpez (2), M. Saparrat (3), (1) Facultad de Ciencias Agrarias y Forestales, La Plata, Argentina; (2) Centro de Investigaciones de Fitopatología Facultad de Ciencias Agrarias y Forestales UNLP, La Plata, Argentina; (3) Catedra de Microbiología -INFIVE Facultad de Ciencias Agrarias y Forestales UNLP, La Plata, Argentina
- 73-P Greenhouse Evaluation of Dosage Responses of the Tomato I3 Gene to *Fusarium oxysporum* f. sp. *lycopersici* race 3.**
C. LAND (1), C. Land (2), G. Vallad (2), S. Hutton (2), R. Willis (2), (1) University of Florida, Wimauma, FL, U.S.A.; (2) University of Florida, U.S.A.
- 74-P *Fusarium oxysporum* f.sp. *lycopersici*: Small Chromosomes Define Friend vs Foe.**
K. FENSTERMACHER (1), (1) Penn State University, University Park, PA, U.S.A.

Nematology

- 75-P Phytochemical and antifungal evaluation of *Vernonia glabra* leaves in the management of fungal pathogens affecting common cereals production in Kenya.**
C. WALLIS (1), (1) USDA-ARS, Parlier, CA, U.S.A.
- 76-P Influence of root exudates and soil on attachment of *Pasteuria penetrans* to *Meloidogyne arenaria*.**
C. LIU (1), P. Timper (2), (1) University of Georgia, tifton, GA, U.S.A.; (2) USDA ARS, tifton, GA, U.S.A.
- 77-P Soybean Cyst Nematodes of Ohio: deciphering mechanisms of virulence**
E. WALSH (1), T. Miller (2), A. Grenell (3), B. Cassone (4), C. Taylor (1), (1) The Ohio State University, Wooster, OH, U.S.A.; (2) The Ohio State University, OH, U.S.A.; (3) The College of Wooster, Wooster, OH, U.S.A.; (4) Brandon University, Brandon, MB, Canada
- 78-P Investigating the role of maize for influence on soybean cyst nematode**
R. MEDINA (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 79-P Comparison of ITS1 versus ITS2 regions for characterizing fungal communities colonizing soybean cyst nematode**
W. HU (1), K. Bushley (1), S. Chen (2), (1) Department of Plant Biology, University of Minnesota, St. Paul, MN, U.S.A.; (2) Southern Research and Outreach Center, University of Minnesota, Waseca, MN, U.S.A.
- 80-P *Gossypium arboreum* accessions resistant to *Rotylenchulus reniformis* identified**
S. STETINA (1), J. Erpelding (1), (1) USDA, Agricultural Research Service, Stoneville, MS, U.S.A.
- 81-P Movement of Fluopyram in Sandy Soil to Affect *Meloidogyne incognita* Motility**
T. FASKE (1), K. Hurd (2), (1) University of Arkansas, Cooperative Extension Service, Lonoke, AR, U.S.A.; (2) University of Arkansas, Cooperative Extension Service, U.S.A.
- 82-P Root Knot Nematode (*Meloidogyne incognita*) populations on eggplant could be reduced using Marigold extracts**
A. HAMEED (1), N. Liaqat (2), K. Riaz (2), M. Alam (2), S. Sarfraz (2), S. Jameel (2), (1) University of Agriculture, Faisalabad, Pakistan, Faisalabad, Other, Pakistan; (2) University of Agriculture Faisalabad, 38040-Pakistan, Pakistan; (3) University of Agriculture Faisalabad, 38040-Pakistan, Faisalabad, Pakistan

- 83-P Soybean cyst nematode culture collections and field populations from North Carolina and Missouri reveal high incidences of infection by viruses**
C. RUARK (1), S. Koenning (2), M. Mitchum (3), E. Davis (2), C. Opperman (2), S. Lommel (2), T. Sit (2), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) North Carolina State University, U.S.A.; (3) University of Missouri, U.S.A.
- 84-P Potential of trap cropping for managing root-knot nematode**
B. WESTERDAHL (1), (1) University of California Entomology & Nematology Department, Davis, CA, U.S.A.
- 85-P Cover cropping affects plant-parasitic and free-living nematodes in Michigan carrot production**
Z. GRABAU (1), Z. Maung (1), D. Noyes (1), D. Brainard (1), D. Baas (2), B. Werling (3), H. Melakeberhan (1), (1) Michigan State University Department of Horticulture, East Lansing, MI, U.S.A.; (2) Michigan State University Extension-St. Joseph County, Centreville, MI, U.S.A.; (3) Michigan State University Extension-Oceana County, Hart, MI, U.S.A.
- 86-P Mode of action studies on the nematicide fluensulfone**
P. NAVIA GINE (1), (1) 1973, Wellington, FL, U.S.A.

Oomycetes

- 87-P Temporal analysis of oomycete communities associated with soybean and corn**
M. CHILVERS (1), J. Rojas (1), (1) Michigan State University, East Lansing, MI, U.S.A.
- 88-P Survey data reveals potential interactions between soil-borne fungi and oomycetes isolated in the midwest**
A. CORRION (1), B. Day (2), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Michigan State University, U.S.A.
- 89-P Breadth of resistance of *Phytophthora* fruit rot resistant watermelon germplasm to *Phytophthora capsici* isolates from across United States of America**
C. KOUSIK (1), J. Ikerd (1), M. Mandal (2), (1) U.S. Department of Agriculture, Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.; (2) ORISE Participant, U.S. Vegetable Laboratory, USDA, ARS., Charleston, SC, U.S.A.
- 90-P The Effect of Increased Soil Fertility on Seedling Disease Development of Soybean in Ohio**
M. EYRE (1), S. Culman (1), A. Dorrance (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 91-P Cold stress at planting increase susceptibility to damping-off caused by *Pythium sylvaticum***
M. SERRANO (1), A. Robertson (1), (1) Iowa State University, Ames, IA, U.S.A.
- 92-P Pathogenicity and Virulence of Oomycete Species on Common Bean**
D. ROSSMAN (1), M. Chilvers (1), A. Rojas (2), J. Jacobs (2), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Michigan State University, U.S.A.
- 93-P Putative sucrose esters from *Petunia x hybrida* may contribute to this host's reduced susceptibility to *Phytophthora infestans***
C. FENG (1), J. Correll (1), (1) University of Arkansas, U.S.A.
- 94-P Identification and characterization of potential oomycete pathogens from the University Agricultural Laboratory in Fresno, California**
M. ELLIS (1), H. Deniston-Sheets (1), D. Sieperda (2), J. Bushoven (1), (1) Plant Science Department, California State University, Fresno, Fresno, CA, U.S.A.; (2) California State University, Fresno, Fresno, CA, U.S.A.

- 95-P The impact of laurel wilt caused by *Raffaelea lauricola* on clonal populations of pondberry (*Lindera melissifolia*)**
G. BRUCE (1), J. Robson (2), M. McDonald (2), (1) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (2) University of Guelph, Guelph, ON, Canada
- 96-P Estimates of viable resting spores of *Plasmodiophora brassicae* using propidium monoazide and qPCR**
B. GOSSEN (1), F. Al-Daoud (2), M. McDonald (2), (1) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (2) University of Guelph, Guelph, ON, Canada
- 97-P Phenotypic variation between two clades of *Phytophthora cinnamomi* isolated from avocado fields in California**
R. BELISLE (1), B. McKee (2), W. Hao (2), P. Manosalva (2), (1) University of California, Riverside, Riverside, CA, U.S.A.; (2) University of California Riverside, Riverside, CA, U.S.A.
- 98-P Phylogenetic relationships among Philippine isolates of *Peronosclerospora* based on sequence analysis of multiple mitochondrial loci**
F. DELA CUEVA (1), M. Samaco (1), M. Ramon (2), F. Martin (2), (1) Institute of Plant Breeding, University of the Philippines Los Baños, Laguna, Philippines; (2) USDA ARS, Salinas, CA, U.S.A.

Virology

- 99-P Identification of conserved transcriptome responses to propagative plant viruses in insect vectors.**
K. MARTIN (1), K. Barandoc-Alviar (1), D. Rotenberg (1), A. Whitfield (1), (1) Kansas State University, Manhattan, KS, U.S.A.
- 100-P An optimized multiplex detection protocol captures divergent isolates of yellow dwarf virus species in Kansas wheat**
A. LANEY (1), R. Acosta-Leal (1), A. Whitfield (1), D. Rotenberg (1), (1) Kansas State University, Manhattan, KS, U.S.A.
- 101-P Impact of downy brome (*Bromus tectorum*) and volunteer wheat on risk of winter wheat infection by *Wheat streak mosaic virus***
N. RANABHAT (1), Z. MILLER (1), E. LEHNHOFF (2), F. MENALLED (1), T. SEIPEL (1), M. BURROWS (1), (1) MONTANA STATE UNIVERSITY, Bozeman, MT, U.S.A.; (2) New Mexico State University, Las Cruces, NM, U.S.A.
- 102-P A full genome cDNA clone of Cherry rusty mottle associated virus induces disease in sweet cherry**
D. VILLAMOR (1), S. Pillai (1), K. Eastwell (1), (1) Washington State University, Prosser, WA, U.S.A.
- 103-P Comparative analyses of world-wide cucumber green mottle mosaic virus (CGMMV) isolates**
T. PITMAN (1), B. Falk (1), (1) UC Davis, Davis, CA, U.S.A.
- 104-P The viroplasm of *Rhizoctonia solani* and its effect in fungal pathogenicity**
T. STETINA (1), C. Rothrock (1), T. Spurlock (2), I. Tzanetakis (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Arkansas, Monticello, AR, U.S.A.
- 105-P Studies on Groundnut rosette disease and implications of the newly reported *Groundnut ringspot virus* for groundnut production in Ghana**
A. APPIAH (1), R. Tegg (2), S. Offei (3), C. Wilson (2), (1) Tasmanian Institute of Agriculture, School of Land and Food, University of Tasmania, Australia, Hobart, Australia; (2) Tasmanian Institute of Agriculture, School of Land and Food, University of Tasmania, Australia, New Town, Australia; (3) School of Agriculture and Consumer Sciences, University of Ghana, Legon, Accra, Ghana, Accra, Ghana
- 106-P Detection, Distribution and Effect of Hop stunt viroid on different hop cultivars**
M. KAPPAGANTU (1), J. Bullock (1), S. Kenny (2), K. Eastwell (2), (1) Washington State University, Pullman, WA, U.S.A.; (2) IAREC-Washington State University, Prosser, WA, U.S.A.

- 107-P WITHDRAWN**
- 108-P Discovery of various dsRNA mycoviruses in *Trichoderma* spp. causing green mold disease of shiitake *Lentinula edodes***
D. KIM (1), (1) Chonbuk National University, South Korea
- 109-P Mixed Infection of Two Economically Important Tospoviruses in *Nicotiana benthamiana***
K. ZHAO (1), C. Rosa (1), (1) The Pennsylvania State University, University Park, PA, U.S.A.
- 110-P Complete genome sequence of a Watermelon mosaic virus isolate from watermelon after 50 years of its detection in the United States of America**
A. ALI (1), N. Rajbanshi (1) (1) The University of Tulsa, U.S.A.
- 111-P Interactions between *Bell pepper endornavirus* and acute viruses**
C. ESCALANTE (1), R. Valverde (1), (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.
- 113-P Variation in aphid abundance and *Potato Virus Y* incidence in Oregon potato.**
S. BAG (1), K. Frost (1), S. Rondon (1), B. Charlton (2), D. Walenta (3), (1) HAREC, OSU, Hermiston, OR, U.S.A.; (2) Klamath Basin Research and Extension Center, OSU, Klamath Falls, OR, U.S.A.; (3) OSU Extension Service, La Grande, OR, U.S.A.
- 114-P Isolation and characterization of FRs551, a bacteriophage associated with the phyto bacterium *Ralstonia solanacearum* strain UW551**
M. STULBERG (1), J. Mershon (2), A. Ahmad (3), D. Mollov (4), Q. Huang (2), (1) FNPRU, USDA/ARS & ORISE, Beltsville, MD, U.S.A.; (2) FNPRU, USDA/ARS, U.S.A.; (3) FNPRU, USDA/ARS & Department of Plant Pathology, Faculty of Agriculture, Minia University, El-minia 61519, Egypt, U.S.A.; (4) NGRL, USDA/ARS, Beltsville, MD, U.S.A.; (5) FNPRU, USDA/ARS, Beltsville, MD, U.S.A.
- 115-P Identification of conserved sequences within tospovirus genomes for broad-spectrum resistance using RNA interference (RNAi)**
J. OLIVER (1), D. Rotenberg (1), A. Whitfield (1), (1) Kansas State University, Manhattan, KS, U.S.A.
- 116-P Correlation of endogenous pararetrovirus with symptoms of citrus blight disease**
A. ROY (1), J. Hartung (2), A. Stone (1), J. Sharo (2), R. Brlansky (3), W. Schneider (1) (1) USDA-ARS-FDWSRU, U.S.A.; (2) USDA-ARS-MPPPL, U.S.A.; (3) University of Florida, CREC, U.S.A.
- 117-P Genetic diversity, host range and disease resistance to the emerging Tomato mottle mosaic virus on tomato**
X. SUI (1), R. Li (1), C. Padmanabhan (1), K. Ling (1), (1) USDA-ARS, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.

Postharvest Pathology and Mycotoxins

- 118-P Diversity of aflatoxin-producing fungi in non-agriculture soils of Zambia**
P. KACHAPULULULA (1), J. AKELLO (2), R. BANDYOPADHYAY (3), P. COTTY (4), (1) UNIVERSITY OF ARIZONA, TUCSON, AZ, U.S.A.; (2) INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA), LUSAKA, Zambia; (3) INTERNATIONAL INSTITUTE OF TROPICAL AGRICULTURE (IITA), IBADAN, Nigeria; (4) USDA-ARS/UNIVERSITY OF ARIZONA, TUCSON, AZ, U.S.A.
- 119-P Differential effects of DON and 15-ADON on maize seedling growth**
Y. MENG (1), J. Li (2), G. Munkvold (3), C. Liang (2), L. Luo (2), (1) China Agricultural University; Iowa State University; Hexi University, Beijing, China; (2) China Agricultural University, China; (3) Iowa State University, U.S.A.
- 120-P Diversity of aflatoxin producing fungi in Malawi**
C. CHING'ANDA (1), J. Atehnkeng (2), R. Bandyopadhyay (3), P. Cotty (4), (1) University of Arizona, Tucson, AZ, U.S.A.; (2) International Institute of Tropical Agriculture (IITA), Lilongwe, Malawi; (3) International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria; (4) USDA-ARS, The University of Arizona, School of Plant Sciences, Tucson, U.S.A.

- 121-P Effects of nutrients and microorganisms on aflatoxin production by *Aspergillus flavus* during successive generations of subculturing**
O. OMOLEHIN (1), Y. Ruarang (2), R. Brown (3), Z. Chen (2), (1) Louisiana State University, Baton Rouge, LA, U.S.A.; (2) Department of Plant Pathology and Crop Physiology, Louisiana State University, Baton Rouge, LA, U.S.A.; (3) Southern Regional Research Center, USDA-ARS., New Orleans, LA, U.S.A.
- 122-P Mycotoxins contamination on hybrids and landraces of stored maize grain in México**
L. VASQUEZ-SILLER (1), K. Ordóñez-Morales (2), J. Soria-Ruiz (3), (1) Universidad Autónoma Agraria Antonio Narro, Saltillo, Mexico; (2) Semillas Berestain, Celaya, Mexico; (3) Instituto nacional de Investigaciones Forestales Agrícolas y Pecuarias (INIFAP), Metepec, Mexico
- 123-P Profile of Aspergilli in fields under continuous maize and groundnut cultivation and aflatoxin contamination along the crop value chains in Mozambique**
J. AUGUSTO (1), J. Atehnkeng (2), J. Akello (3), P. Cotty (4), R. Bandyopadhyay (5), (1) Intl Inst of Tropical Agriculture, Nampula, Other, Mozambique; (2) International Institute of Tropical Agriculture, Lilongwe, Other, Malawi; (3) International Institute of Tropical Agriculture, Lusaka, Zambia; (4) University of Arizona, Tucson, AZ, U.S.A.; (5) International Institute of Tropical Agriculture, Ibadan, Nigeria
- 124-P Influence of corn GMO traits for insect control on aflatoxin and fumonisin contamination in Texas**
T. ISAKEIT (1), T. Isakeit (1), S. Murray (2), J. Pekar (2), (1) Texas A&M University, College Station, TX, U.S.A.; (2) Texas A&M University, U.S.A.
- 125-P Conidial versus sclerotial production: implications for corn and soil niche specialization in *Aspergillus flavus***
R. SWEANY (1), C. DeRobertis (1), K. Damann (1), (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.
- 126-P Evaluation of sorghum germplasm for resistance to grain mold and mycotoxin contamination in the Mid-Atlantic**
B. ACHARYA (1), N. McMaster (2), M. Balota (1), D. Schmale (2), (1) Virginia Tech Tidewater AREC, Suffolk, VA, U.S.A.; (2) Virginia Tech, Blacksburg, VA, U.S.A.
- 127-P Seasonal population dynamics of mycotoxigenic *Aspergillus* section *Nigri* species on grapes and in vineyard soil using ddPCR**
W. HAO (1), H. Förster (1), T. Miles (2), F. Martin (3), G. Browne (4), J. Adaskaveg (1), (1) University of California, Riverside, Riverside, CA, U.S.A.; (2) California State University, Monterey Bay, Seaside, CA, U.S.A.; (3) USDA-ARS, Salinas, CA, U.S.A.; (4) University of California, Davis and USDA-ARS, Davis, CA, U.S.A.
- 128-P Factors influencing *Aspergillus flavus* community structures in fields treated with the atoxigenic biocontrol *A. flavus* AF36**
R. JAIME (1), P. Cotty (2), (1) University of Arizona, Tucson, AZ, U.S.A.; (2) USDA-ARS, University of Arizona, Tucson, AZ, U.S.A.
- 129-P Correlation between the disease incidence of Fusarium head blight and the mycotoxin content of winter cereal crops in Korea**
H. SHIM (1), H. Shim (2), I. Kang (2), D. Shin (2), J. Roh (2), S. Heu (2), (1) National Institute of Crop Science, South Korea; (2) National Institute of Crop Science, South Korea
- 130-P Analysis of deoxynivalenol and deoxynivalenol-3-glucoside in Canadian spring wheat varieties inoculated with *Fusarium graminearum***
- 131-P Seed Quality of Maize Cultivars Infected With *Pantoea agglomerans***
H. SILVA-ROJAS (1), G. Morales-Valenzuela (1), L. Cordova-Tellez (1), D. Ochoa Martínez (1), A. Carballo-Carballo (1), (1) Colegio de Postgraduados, Texcoco, Mexico
- 132-P Rapid detection of preexisting internal *Leuconostoc spp.* spoilage populations in fresh-cut carrots during storage**
K. BRITT (1), T. Suslow (1), (1) UC Davis, Davis, CA, U.S.A.
- 133-P Controlling bacterial soft rot in tomato fruit that have been inoculated through lenticels located around the stem attachment.**
J. BARTZ (1), D. Spiceland (1), M. Elkahky (3), J. Brecht (4), (1) University of Florida, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.; (3) Faculty of Agriculture, Mansoura University, Mansoura, Egypt; (4) Horticultural Sci.; University of Florida, Gainesville, FL, U.S.A.
- 134-P Assessment of hermetic storage of maize under different environmental conditions**
B. LANE (1), C. Woloshuk (1), (1) Purdue University, West Lafayette, IN, U.S.A.
- 135-P Bitter rot on apple: Comparative epidemiology of *Colletotrichum* species and growth temperature**
R. MOREIRA (1), E. Zielinski (2), A. Filho (3), L. May De Mio (2), (1) Federal University of Parana, Curitiba, Brazil; (2) Federal University of Parana, Brazil; (3) University of Sao Paulo, Brazil
- 136-P Use of induced resistance for the management of postharvest decay of fruit**
G. ROMANAZZI (1), (1) Marche Polytechnic University, Ancona, Italy
- 137-P WITHDRAWN**
- 138-P Susceptibility of sweetpotato (*Ipomoea batatas*) cultivars to fungal and bacterial diseases**
E. PALENCIA (1), L. Quesada-Ocampo (1), (1) North Carolina State University, Raleigh, NC, U.S.A.
- 139-P Development of edible composite coatings with antifungal GRAS salts for reduction of postharvest gray mold of cherry tomato fruit**
L. PALOU (1), C. Fagundes (2), A. Monteiro (2), M. Pérez-Gago (3), (1) Institut Valencià d'Investigacions Agràries (IVIA), Montcada, Spain; (2) Universidade Federal de Santa Catarina, Florianópolis, Brazil; (3) IVIA, Montcada, Spain

Biological Control

- 140-P Analysis of IAA and ABA in HLB diseased citrus trees**
Z. PANG (1), H. Wang (1), N. Wang (1), (1) citrus research and educational center, Lake Alfred, FL, U.S.A.
- 141-P Seasonal variation in the antibacterial activity of latex-like resin from *Sciadopitys verticillata***
K. GWINN (1), D. Yates (1), B. Ownley (1), N. Labbe' (1), (1) University of Tennessee, Knoxville, TN, U.S.A.
- 142-P WITHDRAWN**
- 143-P Bioactive effect of triterpene extracts in mix with *Pseudomonas* to control *Gaeumannomyces graminis* var. *tritici* on wheat plants**
E. MOYA ELIZONDO (1), J. González (2), T. Quezada (2), G. Silva (2), (1) Departamento de Producción Vegetal, Universidad de Concepción, Chillán, Other, Chile; (2) Universidad de Concepción, Chillán, Other, Chile
- 144-P Protection of wheat against *Zymoseptoria tritici* using sugar beet extract-based resistance inducers**
A. SIAH (1), S. MEJRI (2), A. GHINET (3), B. RIGO (3), C. ABUHAIE (3), M. MAGNIN-ROBERT (4), B. RANDOUX (4), P. REIGNAULT (4), P. HALAMA (2), (1) Institut Charles Viollette (EA 7394), Institut Supérieur d'Agriculture, Lille, France; (2) Institut Charles Viollette (EA 7394), Institut Supérieur d'Agriculture, France; (3) Laboratoire de Pharmacochimie (INSERM U995-LIRIC unit), Hautes études d'ingénieur, France; (4) Unité de Chimie Environnementale et Interactions sur le Vivant (EA 4492), Université du Littoral Côte d'Opale, France
- 145-P WITHDRAWN**
- 146-P Switchgrass Extractives Inhibit Plant Pathogenic Fungi**
A. BRUCE (1), B. Ownley (1), J. Tao (1), N. Labbe (1), K. Gwinn (1), D. D'Souza (1), N. Moustaid-Moussa (2), (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) Texas Tech University, Lubbock, TX, U.S.A.
- 147-P Quantitative assessment of the efficacy of ZnO nanoparticles against selected fruit fungal contaminants**
D. SARDELLA (1), R. Gatt (2), S. Decelis (3), V. Valdramidis (4), (1) University of Malta, Msida, Malta; (2) University of Malta, Metamaterials Unit, Malta; (3) Ministry for Health, Malta; (4) University of Malta, Faculty of Health Sciences, Malta

- 148-P Recommendation of Clove oil to minimize *Penicillium* based postharvest losses in pomegranates (*Punica granatum* L).**
M. ALAM (1), M. Alam (2), A. Rehman (3), M. Amin (4), K. Riaz (3), (1) Department of Plant Pathology, University of Agriculture, Faisalabad, Pakistan, Faisalabad, Pakistan; (2) Department of Plant Pathology, University of Agriculture Faisalabad, 38040-Pakistan, Faisalabad, Pakistan; (3) Department of Plant Pathology, University of Agriculture Faisalabad, 38040-Pakistan, Faisalabad, Pakistan; (4) Institute of Horticultural Sciences, University of Agriculture Faisalabad, 38040-Pakistan, Faisalabad, Pakistan
- 149-P Summary of 11-year field trials of using Heads Up® - a Saponin plant protectant to manage soybean diseases.**
S. NAVI (1), X. Yang (1), (1) Iowa State University, Ames, IA, U.S.A.
- 150-P WITHDRAWN**
- 151-P Efficacy of synthetic and biorational products against powdery mildew of flowering dogwood**
P. LIYANAPATHIRANAGE (1), T. Simmons (1), M. Kabir (1), K. Adesso (1), F. Baysal-Gurel (1), (1) Tennessee State University, U.S.A.; (2) Tennessee State University, Nashville, TN, U.S.A.
- 152-P Antifungal effect of nano sized zero valent iron (nZVI) to special fungal pathogens in paprika and tomato crop**
M. PARK (1), J. Kim (1), Y. Lee (2), S. Kim (2), (1) Cheorwon Plasma Research Institute, Gangwon-do, South Korea; (2) Department of Applied Plant Sciences College of Agriculture and Life Sciences/Gangwon National Univ., Chuncheon, South Korea
- 153-P Natural products reduce grey mold of tomato caused by *Botrytis cinerea***
F. AHMED (1), A. Alvarez (1), B. Sipes (1), (1) university of hawaii at manoa, honolulu, HI, U.S.A.
- 154-P Identification of volatiles with nematocidal activities from *Sphingobacterium nematocida* ZY-71-1 and control efficiency to *Meloidogyne incognita***
J. CHANG (1), W. Mu (2), J. Xi (2), J. Song (2), (1) Sanmenxia Tobacco Company Lushixian Branch, China; (2) Zhengzhou Tobacco Research Institute of CNTC, China
- 155-P The Role of the Citrus Microbiome in Tree Health and Tolerance to Pathogens**
N. GINNAN (1), T. Dang (2), P. Ruegger (2), J. Borneman (2), P. Rolshausen (2), G. Vidalakis (2), S. Bodaghi (2), M. Roper (2), (1) University of California Riverside - Department of Plant Pathology and Microbiology, Riverside, CA, U.S.A.; (2) University of California Riverside, U.S.A.; (3) University of California Riverside, Riverside, CA, U.S.A.
- 156-P Fungal antagonism of bacteria isolated from Cultivated and Wild Cranberry Bogs**
S. SOBY (1), G. Ebadzad (1), E. Batory (1), (1) Midwestern University, Glendale, AZ, U.S.A.
- 157-P Relative efficacy of Zambian atoxigenic *Aspergillus flavus* strains against aflatoxin-producing *Aspergillus* species**
J. AKELLO (1), T. Dubois (2), J. Atehnkeng (3), M. Mukanga (4), H. Njapau (5), J. Augusto (6), P. Cotty (7), R. Bandyopadhyay (3), (1) International Institute of Tropical Agriculture (IITA-Zambia), Zambia; (2) The World Vegetable Center (AVRDC) Eastern and Southern Africa, Arusha, Tanzania; (3) International Institute of Tropical Agriculture (IITA-Nigeria), Ibadan, Nigeria; (4) Zambia Agricultural Research Institute, Mount Makulu Central Research Station, Lusaka, Zambia; (5) National Institute for Scientific and Industrial Research (NISIR), Lusaka, Zambia; (6) International Institute of Tropical Agriculture (IITA-Mozambique), Nampula, Mozambique; (7) USDA-ARS, School of Plant Sciences, University of Arizona, Tucson, U.S.A.
- 158-P Incidence of soybean frog-eye leaf spot in Korea and selection for antagonistic bacteria controlling *Cercospora sojina* Hara**
I. KANG (1), I. Kang (1), H. Shim (2), D. Shin (2), J. Roh (2), S. Heu (2), (1) National Institute of Crop Science, South Korea; (2) National Institute of Crop Science, South Korea
- 159-P Integration between 2,4-DAPG-producing *Pseudomonas* and fluquinconazole to control take-all disease of wheat in Chile.**
E. MOYA ELIZONDO (1), C. Vera (1), R. Madariaga Burrows (2), (1) Universidad de Concepción, Chillán, Other, Chile; (2) Instituto de Investigaciones Agropecuarias, INIA Quilamapu, Chillán, Other, Chile
- 160-P Stopping the cereal killer: exploring biological control to mitigate Fusarium head blight of wheat**
A. BEHARI (1), G. Kuldau (1), (1) Pennsylvania State University, State College, PA, U.S.A.
- 161-P Identification of members of the secretome of *Trichoderma virens* involved in colonization of plant roots**
F. ROTONDO (1), B. McSpadden Gardner (2), P. Paul (1), (1) The Ohio State University, Wooster, OH, U.S.A.; (2) The Ohio State University, Wooster, U.S.A.
- 162-P Biocontrol of Fusarium head blight with *Bacillus* spp.**
K. BOWEN (1), J. Anderson (1), K. Liu (1), (1) Auburn University, Auburn, AL, U.S.A.
- 163-P Selection and characterization of probiotics for rye silage**
C. JEON (1), H. Kim (1), J. Kim (1), Y. Kwak (2), (1) Division of Applied Life Science, Gyeongsang National University, Jinju 52828, Republic of Korea, South Korea; (2) Institute of Agriculture & Life Science, Gyeongsang National University, Jinju 52828, Republic of Korea, South Korea
- 164-P Inhibition of *Penicillium expansum* growth on Golden Delicious apples by wild yeasts from various plant materials**
- 165-P WITHDRAWN**
- 166-P Evaluation of potential biocontrol agents against fungal plant pathogens affecting strawberry**
R. BITTER (1), G. Holmes (2), (1) California Polytechnic State University, San Luis Obispo, CA, U.S.A.; (2) Cal Poly Strawberry Center, San Luis Obispo, CA, U.S.A.
- 167-P Effects of *Clonostachys* species on charcoal rot disease caused by *Macrophomina phaseolina* in soybean**
A. ADESEMOYE (1), H. Wei (1), (1) University of Nebraska Lincoln, North Platte, NE, U.S.A.
- 168-P *Trichoderma asperellum* survival and parasitism of *Sclerotinia sclerotiorum* sclerotia in different soil types**
M. LOBO (1), A. Geraldine (2), F. Yoshida (3), E. Civardi (3), E. Barbosa (1), (1) Embrapa (Brazilian Agricultural Research Corporation), National Center for Rice and Beans Research, Santo Antônio de Goiás, Brazil; (2) Instituto Federal Goiano, Rio Verde, Brazil; (3) Universidade Federal de Goiás, Goiânia, Brazil
- 169-P In-vitro control of *Calonectria pseudonaviculata* by bacteria recovered from irrigation water**
X. YANG (1), C. Hong (2), (1) Hampton Roads Agricultural Research and Extension Center, Virginia Tech, Virginia Beach, VA, U.S.A.; (2) Hampton Roads Agricultural Research and Extension Center, Virginia Tech, U.S.A.
- 170-P Characterization and distribution of natural populations of *Cryptococcus flavescens* across the United States**
K. PARK (1), J. Shin (1), K. Myeong (1), S. Lee (1), S. Lee (1), M. Kim (1), K. Kim (1), (1) National Institute of Horticultural and Herbal Science, Eumseong, South Korea
- 171-P *Curvularia psadiei* as a biological control agent for barnyard grass (*Echinochloa crus-galli*) in rice fields**
Y. SHABANA (1), A. Abu Tabl (1), (1) Mansoura University, El-Mansoura, Egypt
- 172-P WITHDRAWN**
- 173-P Biocontrol of Tubakia leaf blight by *Paenibacillus peoriae*(HB774)**
H. YUN (1), Y. Kim (1), (1) Seoul National University, Seoul, South Korea
- 174-P *Acaromyces ingoldii* inhibits the laurel wilt pathogen, *Raffaelea lauricola* in vitro.**
R. OLATINWO (1), S. Fraedrich (2), (1) USDA Forest Service, Southern Research Station, Pineville, LA, U.S.A.; (2) USDA Forest Service, Southern Research Station, U.S.A.
- 175-P Applications of *Bacillus amyloliquefaciens* PMB01 for managing Fusarium wilt of cucumber**
W. DENG (1), H. Chou (2), I. Yang (3), Y. Lin (4), H. Wang (2), S. Chuang (2), T. Huang (2), (1) National Chung Hsing University, Taichung, Taiwan; (2) Kaohsiung District Agricultural Research and Extension Station, Pingtung,

Taiwan; (3) Taiwan Agricultural Mechanization Research and Development Center, Taipei, Taiwan; (4) National Pingtung University of Science and Technology, Pingtung, Taiwan

- 176-P The potential use of a *Cladosporium* sp. as a biological control agent for white mold caused by *Sclerotinia sclerotiorum***
B. ROBINSON (1), R. Cating (2), K. Frost (2), (1) Oregon State University; Hermiston High School, Hermiston, OR, U.S.A.; (2) Oregon State University, Hermiston, OR, U.S.A.
- 177-P Infection duration of entomopathogenic fungi *Aspergillus* spp. and *Fusarium* spp. against *Bemisia tabaci***
W. Anwar (1), H. Mushtaq (1), M. Haider (1), A. Shahid (1), U. Hameed (1), M. Ur-Rehman (1), (1) Institute of Agricultural Sciences, University of the Punjab, Lahore, Pakistan, 54590, Lahore, Pakistan
- 178-P Field Performance of Endophytic Actinomycetes in Relation to Plant Growth Promotion and Biological Control of *Fusarium oxysporum* a Pathogen of Tomato**
K. EL-TARABILY (1), A. Alkhajeh (1), (1) United Arab Emirates University, Al-Ain, Other, Uae
- 179-P Assessment of three *Trichoderma* species to protect cabbage from Clubroot**
A. BOTERO (1), A. Cotes (2), C. García (3), (1) Universidad Nacional de Colombia, Bogotá, Colombia; (2) CORPOICA, Bogotá, Colombia; (3) Universidad Nacional de Colombia, Colombia
- 180-P Evaluation of the biocontrol potential of different *Pseudomonas* species in suppressing Pythium root rot in petunia plugs**
D. MARTIN (1), M. Jones (2), C. Taylor (2), F. Peduto Hand (1), (1) The Ohio State University, Columbus, OH, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.
- 181-P Microbiome networks: A systems framework for identifying candidate microbial assemblages for disease management**
R. POUDEL (1), A. Jumpponen (2), D. Schlatter (3), T. Paulitz (3), B. McSpadden Gardener (4), L. Kinkel (5), K. Garrett (1), (1) Plant Pathology Department, Institute for Sustainable Food Systems, and Emerging Pathogens Institute, University of Florida, Gainesville, FL, U.S.A.; (2) Division of Biology and Ecological Genomics Institute, Kansas State University, Manhattan, KS, U.S.A.; (3) USDA-ARS, Wheat Health, Genetics, and Quality Research Unit, Washington State University, Pullman, WA, U.S.A.; (4) Department of Plant Pathology, The Ohio State University, Wooster, OH, U.S.A.; (5) Department of Plant Pathology, University of Minnesota, St. Paul, MN, U.S.A.
- 182-P Linking microbial taxa in SDS-suppressive soils of Soybean fields**
A. SROUR (1), A. Fakhoury (1), J. Bond (2), L. Leonardo (3), D. Malvick (4), (1) Southern Illinois University, Carbondale, IL, U.S.A.; (2) Southern Illinois University, U.S.A.; (3) Iowa state University, U.S.A.; (4) University of Minnesota, U.S.A.
- 183-P Isolation of endophytic bacteria associated with roots from citrus infected with *Phytophthora nicotianae***
A. OLIVARES (1), J. Hernandez-Mendoza (1), S. Nelson (2), V. Ancona (1), (1) Texas A&M Kingsville Citrus Center, Weslaco, TX, U.S.A.; (2) Texas A&M Kingsville Citrus Center, U.S.A.
- 184-P Seasonal dynamics of fungal communities in pistachio and almond in California: implications for aflatoxin biocontrol management**
A. ORTEGA-BELTRAN (1), R. Puckett (2), T. Michailides (3), D. Morgan (4), J. Moral (3), (1) UC Davis, Parlier, CA, U.S.A.; (2) UC Davis -KARE, Parlier, CA, U.S.A.; (3) UC Davis, U.S.A.; (4) UC Davis -KARE, U.S.A.
- 185-P Leaf applications of *Clonostachys rosea* reduce the populations of *Botrytis cinerea* and changes the metabolic profiles of strawberry plants**
L. MAFFIA (1), A. Borges (2), W. Araujo (1), (1) Universidade Federal de Vicosa, Vicosa, Brazil; (2) Universidade Federal de Vicosa, Vicosa, Brazil
- 186-P Reduction of soybean sudden death syndrome (*Fusarium virguliforme*) by seed treatment with *Bradyrhizobium japonicum***
T. HUYNH (1), T. Huynh (1), X. Yang (1), S. Navi (1), X. Li (1), (1) Iowa State University, Ames, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.
- 187-P The use of fungal biological control agents to manage SDS, charcoal rot, and damping off in soybean**
A. WARNER (1), E. Arnao (2), A. Fakhoury (2), (1) Southern Illinois University Carbondale, Carbondale, IL, U.S.A.; (2) Southern Illinois University Carbondale, U.S.A.
- 188-P Biological control of soilborne diseases in organic potato production using hypovirulent strains of *Rhizoctonia solani***
R. LARKIN (1), (1) USDA-ARS, Orono, ME, U.S.A.
- 189-P Evaluation of Management Practices on the Efficacy of *Pasteuria nishizawae* As a Biocontrol Agent of Soybean Cyst Nematode.**
M. LUND (1), S. Conley (1), J. Ané (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.
- 190-P Effect of biopesticides on *Phytophthora* Root Rot Disease of Oakleaf Hydrangea**
M. KABIR (1), P. Liyanapathirana (1), T. Simmons (1), F. Baysal-Gurel (1), (1) Tennessee State University, Nashville, TN, U.S.A.
- 191-P Putative biocontrol mechanisms of rice bacterial blight by *Bacillus subtilis* TKS1-1**
T. HUANG (1), Y. Chen (1), Y. Jan (1), Y. Yeh (1), D. Tzeng (1), (1) Department of Plant Pathology, National Chung Hsing University, Taichung, Taiwan
- 192-P Amino acids influence antibiotic production by *Pantoea vagans* strain C9-1**
J. KLEIN (1), V. Stockwell (2), J. Loper (2), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS, Horticultural Crops Research Unit, Corvallis, OR, U.S.A.
- 193-P WITHDRAWN**
- 194-P Characterization of antibacterial activity of *Pseudomonas chlororaphis* strain UFB2 and its application in management of bacterial canker of tomato**
S. LU (1), P. Deng (1), S. Baird (2), X. Wang (1) (1) Mississippi State University, Starkville, MS, U.S.A.; (2) Mississippi State University, Starkville, MS, U.S.A.
- 195-P WITHDRAWN**
- 196-P Microscopic analysis of parasitism mode of action by bacterial biological control agents on *Cornus florida* powdery mildew**
M. MMBAGA (1), (1) Tennessee State University, Nashville, TN, U.S.A.
- 197-P Investigation of antifungal and herbicide volatile terpenes in *Streptomyces* spp.**
G. CHO (1), H. Kim (1), J. Kim (2), J. Kim (1), Y. Kwak (2), (1) Division of Applied Life Science, Gyeongsang National University, Jinju 52828, Republic of Korea, South Korea; (2) Institute of Agriculture & Life Science, Gyeongsang National University, Jinju 52828, Republic of Korea, South Korea
- 198-P Characterization and Expression of the Potent Antimicrobial Peptide LsGRP1C Originated from *Lilium***
C. CHEN (1), C. Lin (1), Y. Pan (2), M. Chang (2), F. Liu (2), (1) National Taiwan University, Taipei, Taiwan; (2) National Taiwan University, Taiwan
- 199-P Functional analyses of the ribosomal and non-ribosomal processed antimicrobial peptides produced by biocontrol bacterium *Bacillus pumilus* PMB102**
W. DENG (1), J. Wu (1), J. Huang (1), (1) National Chung Hsing University, Taichung, Taiwan
- 200-P Study on Colonization of Strain ZY-9-13 labeled with Green Fluorescent Protein(GFP) Gene within Roots of tobacco and its Biocontrol Effect**
J. XI (1), J. Song (1), M. Mo (2), C. Xue (1), W. Mou (1), Q. Yin (1), (1) Zhengzhou Tobacco Research Institute of CNTC, China; (2) YUNNAN UNIVERSITY, China

- 201-P Developing a quantitative polymerase chain reaction protocol to quantitate root colonization by *Bacillus amyloliquefaciens* and *Bacillus firmus***
H. MENDIS (1), L. De La Fuente (1), P. Schwientek (2), R. Salamzade (2), V. Thomas (2), J. Kloepper (3), (1) Auburn University, Auburn, AL, U.S.A.; (2) Bayer CropScience LP, U.S.A.; (3) Auburn University, U.S.A.
- 202-P WITHDRAWN**
- 203-P Effects of seed coating “inert ingredients” in the pathogenicity of *Fusarium graminearum* in soybean.**
K. NAVARRO (1), (1) The Ohio State University, U.S.A.
- 204-P The effects of seed coating “inert ingredients” in the virulence of *Fusarium graminearum* in soybean**
K. NAVARRO (1), (1) The Ohio State University, U.S.A.
- 205-P Predicting the geographic establishment of introduced mycoparasites**
S. COHEN (1), (1) Center for Regulatory Research, LLC, White Bear Lake, MN, U.S.A.
- 206-P Differential Colonization of Tomato Cultivars by the Biocontrol Agent *Beauveria bassiana***
S. YERUKALA (1), M. Dec (1), B. Ownley (1), (1) University of Tennessee, Knoxville, TN, U.S.A.

Chemical Control

- 207-P Effect of seedborne *Xanthomonas translucens* on wheat seed germination**
C. PEREZ (1), E. Juanicotena (2), O. Bentancur (2), C. Palladino (2), (1) EEMAC, Universidad de la Republica, Paysandu, Uruguay; (2) EEMAC, Universidad de la Republica, Uruguay
- 208-P Characterization and Application of Oil-In-Water Nanoemulsion for Controlling Citrus Huanglongbing**
M. ZHANG (1), C. Yang (2), C. Powell (1), Y. Duan (3), R. Shatters (3), (1) IRREC-IFAS, University of Florida, Fort Pierce, FL, U.S.A.; (2) Guangxi University, Nanning, China; (3) USHRL-USDA-ARS, Fort Pierce, FL, U.S.A.
- 209-P Effects of Penicillin Injection for Citrus HLB Control on Culturable Bacteria in Petioles and Rhizosphere, and Penicillin Resistance**
K. SHIN (1), M. Ascunze (1), H. Narouei-Khandan (1), X. Sun (2), D. Jones (2), E. Goss (1), A. van Bruggen (1), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Division of Plant Industry, Gainesville, FL, U.S.A.
- 210-P Evaluation of a novel antimicrobial compound to control growth and biofilm formation in vitro of citrus bacterial pathogens**
H. MENDIS (1), E. Naranjo (1), S. Santra (2), M. Young (2), E. Johnson (3), P. Rajasekaran (2), L. De La Fuente (1), (1) Auburn University, Auburn, AL, U.S.A.; (2) University of Central Florida, Orlando, FL, U.S.A.; (3) Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.
- 211-P Progress towards a novel chemical control for common scab disease of potato**
R. TEGG (1), H. Thompson (2), C. Wilson (1), (1) Tasmanian Institute of Agriculture, University of Tasmania, New Town, Other, Australia; (2) Department of Agriculture, Canberra, Other, Australia
- 212-P Antibacterial potential of Magnesium oxide nanomaterial against *Xanthomonas perforans* causing bacterial spot of tomato**
A. ROY (1), J. Hartung (2), A. Stone (1), J. Shao (2), R. Brlansky (3), W. Schneider (1), (1) USDA-ARS-FDWSRU, Fort Detrick, MD, U.S.A.; (2) USDA-ARS-MPPL, Beltsville, MD, U.S.A.; (3) University of Florida, CREC, Lake Alfred, FL, U.S.A.
- 213-P Adepidy[™]: A new fungicide active ingredient for control of foliar diseases.**
K. BUXTON (1), T. Harp (1), A. Tally (1), H. Mclean (1), (1) Syngenta Crop Protection, U.S.A.; (2) Syngenta Crop Protection, Greensboro, NC, U.S.A.
- 214-P Adepidy[™]: A new fungicide active ingredient for control of *Fusarium* head blight on wheat.**
T. HARP (1), K. Anaka (2), A. Tally (1), (1) Syngenta Crop Protection, Greensboro, NC, U.S.A.; (2) Syngenta Crop Protection, Winnipeg, Canada
- 215-P Quantification of the mortality of conidia of *Botrytis cinerea* and *Penicillium digitatum* in peracetic acid.**
J. SMILANICK (1), L. Grant (2), (1) consultant, Kingsburg, CA, U.S.A.; (2) Jet Harvest Solutions, Longwood, FL, U.S.A.
- 216-P Effect of fungicide applications on *Monilinia fructicola* population diversity and transposon movement**
M. DOWLING (1), H. Boatwright (1), G. Schnabel (1), P. Bryson (1), J. Wilson (1), Z. Fan (1), S. Everhart (3), P. Brannen (4), (1) Clemson University, U.S.A.; (2) Clemson University, Clemson, SC, U.S.A.; (3) University of Nebraska, Lincoln, U.S.A.; (4) University of Georgia, U.S.A.
- 217-P Citrus Canker as a bioassay for systemic bactericidal activity of Zinc nanoparticles**
S. COMMERFORD (1), K. Gerberich (1), P. Rajasekaran (2), M. Young (3), S. Das (3), J. Graham (4), S. Santra (3), E. Johnson (1), (1) Citrus Research Education Center, University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Central Florida, Orlando, FL, U.S.A.; (3) University of Central Florida, U.S.A.; (4) Citrus Research Education Center, University of Florida, U.S.A.
- 218-P Evaluation of the Spatiotemporal Dynamics of Oxytetracycline and Its Control Effect against Citrus Huanglongbing via Trunk Injection**
J. HU (1), J. Hu (2), (1) University of Florida/IFAS-CREC, Lake Alfred, FL, U.S.A.; (2) University of Florida, Lake Alfred, FL, U.S.A.
- 219-P Kasugamycin mixtures with copper, mancozeb, or a thiadiazole improve bactericidal inhibition and efficacy of treatments against walnut blight**
K. NGUYEN (1), H. Forster (1), L. Wade (2), J. Adaskaveg (3), (1) University of California Riverside, Riverside, CA, U.S.A.; (2) Arysta LifeScience, U.S.A.; (3) University of California Riverside, U.S.A.
- 220-P Evaluation of conventional and biological pesticides for managing tomato bacterial spot during transplant production**
P. ABRAHAMIAN (1), J. Jones (2), G. Vallad (1), (1) University of Florida, Wimauma, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.
- 221-P Nanoparticle encapsulation of seed treatment active ingredients for protection of maize seeds against *Fusarium graminearum***
L. WASHINGTON (1), A. Mullis (2), D. Mayfield (3), B. Narasimhan (2), G. Munkvold (3), (1) Department of Plant Pathology Iowa State University, Ames, IA, U.S.A.; (2) Department of Chemical and Biological Engineering Iowa State University, U.S.A.; (3) Department of Plant Pathology Iowa State University, U.S.A.
- 222-P Evaluation of host resistance and chemical control to manage white mold of soybean in Ohio**
J. HUZAR NOVAKOWISKI (1), J. Huzar Novakowski (1), J. Winger (1), P. Paul (1), A. Dorrance (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 223-P Managing QoI-resistant *Cercospora sojina* in Mississippi soybean and assessing the physiological impacts of foliar fungicide phytotoxicity**
J. MANSOUR (1), M. Tomaso-Peterson (2), A. Henn (2), J. Bond (1), T. Irby (2), (1) Mississippi State University, Stoneville, MS, U.S.A.; (2) Mississippi State University, Starkville, MS, U.S.A.
- 224-P Management of *Fusarium* Head Blight and DON in Alabama**
K. BOWEN (1), N. Sharma (1), N. McMaster (2), J. Jones (3), M. Pegues (3), (1) Auburn University, Auburn, AL, U.S.A.; (2) Virginia Tech, Blacksburg, VA, U.S.A.; (3) Alabama Agricultural Experiment Station, Fairhope, AL, U.S.A.
- 225-P WITHDRAWN**
- 226-P Control of apple rots caused by *Phacidiopycnis washingtonensis*, *Phacidium lacerum* y *Diplodia seriata* in postharvest in Chile**
G. A (1), M. Caceres (1), M. Lolas (1), C. Pacheco (1), T. Daza (1), (1) Universidad de Talca, Chile
- 227-P Reducing initial infections of apple scab and black rot with salicylic acid and Actigard applied as trunk injections or sprays.**
P. ABBASI (1), G. Braun (2), E. Bevis (2), S. Fillmore (2), (1) Agriculture and Agri-Food Canada, Kentville, NS, Canada; (2) Agriculture and Agri-Food Canada, Canada

- 228-P Interruption and reduction of *Erysiphe necator* cleistothecia development utilizing fungicidal oil**
L. THIESSEN (1), W. Mahaffee (2), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS, U.S.A.
- 229-P Etiology and management of sour rot in grapes**
M. HALL (1), M. Hall (1), G. Loeb (1), W. Wilcox (1), (1) Cornell University, Geneva, NY, U.S.A.
- 230-P Characterization of *Diaporthe* spp. *Cadophora malorum* and *Neofusicoccum parvum* causing cordon dieback in kiwi plant and their chemical control in Chile**
G. DIAZ (1), M. Lolas (1), B. Latorre (2), E. Ferrada (2), J. Zoffoli (2), (1) Universidad de Talca, Chile; (2) Pontificia Universidad Catolica de Chile, Chile
- 231-P Contribution of protectant fungicides applied as mid-season cover sprays to management of peach brown rot at harvest**
N. LALANCETTE (1), N. Lalancette (1), L. Blaus (1), J. Gager (1), K. McFarland (2), (1) Rutgers University, Agricultural Research & Extension Center, Bridgeton, NJ, U.S.A.; (2) Rutgers University, Agricultural Research & Extension Center, Bridgeton, NJ, U.S.A.
- 232-P Control of black heart caused by *Alternaria alternata* of pomegranate in California.**
R. PUCKETT (1), E. Wilkins (2), T. Michailides (3) (1) UC Davis -KARE, Parlier, CA, U.S.A.; (2) Wonderful Orchards, U.S.A.; (3) UC Davis, U.S.A.
- 233-P Fungicide efficacy for the control of pomegranate diseases in Florida**
A. KC (1), G. Vallad (2), (1) University of Florida, Wimauma, FL, U.S.A.; (2) University of Florida, U.S.A.
- 234-P Effectiveness of fungicide treatments following the Strawberry Advisory System for control of *Botrytis* fruit rots in Florida**
L. CORDOVA (1), A. Amiri (2), N. Peres (3), (1) University of Florida, Wimauma, FL, U.S.A.; (2) Washington State University, U.S.A.; (3) University of Florida, U.S.A.
- 235-P Interaction among leaf area index, spray volumes and fungicide doses in Asian soybean rust control**
A. CHECHI (1), W. Boller (1), C. Forcelini (1), R. Roehrig (1), E. Zuchelli (1), (1) UPE, Passo Fundo, Other, Brazil
- 236-P Relationship between fungicide dose and Asian soybean rust control**
A. CHECHI (1), C. Forcelini (2), W. Boller (2), R. Roehrig (2), E. Zuchelli (2), (1) UPE, Passo Fundo, Other, Brazil; (2) UPE, Passo Fundo, Brazil
- 237-P Response of Early and Late Leaf Spot Diseases on Peanut to QoI Solo Spray Programs**
W. ELWAKIL (1), N. Dufault (1), (1) University of Florida, GAINESVILLE, FL, U.S.A.
- 238-P Effect of fungicide timing and frequency on reducing foliar diseases and yield loss on runner and valencia type peanuts in Haiti**
A. FULMER (1), T. Brenneman (1), R. Kemerait (1), (1) University of Georgia, Tifton, GA, U.S.A.
- 239-P Fungicides for management of *Sclerotium rolfsii* and enhanced overwintering survival of stevia**
A. KOEHLER (1), H. Shew (1), (1) NCSU, Raleigh, NC, U.S.A.
- 240-P Timing of fungicide applications is critical for blackleg control in canola**
L. DEL RIO MENDOZA (1), S. Ruud (1), S. Mansouripour (1), (1) North Dakota State University, Fargo, ND, U.S.A.
- 241-P WITHDRAWN**
- 242-P Evaluation of fungicide efficacy and cultivar susceptibility for the management of anthracnose on celery**
M. MCDONALD (1), M. McDonald (1), (1) University of Guelph, Canada
- 243-P Optimizing the systemicity of triazole formulations by enhancing leaf penetration**
G. POON (1), C. Irwin (2), J. Dinglasan (2), N. Loukine (1), (1) Vive Crop Protection, Toronto, ON, Canada; (2) Vive Crop Protection, Guelph, ON, Canada
- 244-P Season long management of potato silver scurf caused by *Helminthosporium solani* in Wisconsin**
S. MACCHIAVELLI-GIRÓN (1), S. Jordan (1), J. Crane (2), A. Gevens (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) University of Wisconsin-Madison, U.S.A.
- 245-P Greenhouse characterization of hydrazone-copper mixtures as low copper treatments to control early and late blight on tomato**
C. AVILA-ADAME (1), D. Young (2), J. Webster (2), O. Brian (2), D. Ouimette (2), (1) Dow AgroSciences LLC, Indianapolis, IN, U.S.A.; (2) Dow AgroSciences LLC, U.S.A.
- 246-P Yield loss and management of orange cane blotch of blackberry, caused by the alga *Cephaleuros virescens***
F. BROWNNE (1), P. Brannen (1), H. Scherm (1), L. Fall (1), J. Taylor (2), J. Shealey (3), E. Beasley (1), (1) University of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Lakeland, GA, U.S.A.; (3) University of Georgia, U.S.A.
- 247-P Evaluation of Nematicides for Control of Southern Root-Knot Nematodes in Lima Bean**
J. JONES (1), G. Johnson (1), N. Kleczewski (1), J. Desaegeer (2) (1) University of Delaware, U.S.A.; (2) DuPont Crop Protection, U.S.A.
- 248-P Evaluation of soil conditioner OR079 for the optimization of metalaxyl in control of *Phytophthora nicotianae* in Texas citrus orchards**
P. DUBERNEY (1), J. Hernandez (1), V. Ancona (1), (1) Texas A&M Kingsville Citrus Center, Weslaco, TX, U.S.A.
- 249-P Efficacy of Oxathiapiprolin toward *Phytophthora sojae* and *Phytophthora sansomeana***
A. VARGAS (1), M. Eyre (1), A. Dorrance (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 250-P Efficacy of three soybean fungicide seed treatments against *Pythium* species in seed plate and growth chamber assays**
K. SCOTT (1), A. Vargas (1), M. Eyre (1), A. Dorrance (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 251-P Preventative fungicide applications in production and their impact on residual efficacy against impatiens downy mildew in the landscape.**
S. SUAREZ (1), P. Lopez (1), A. Chase (2), A. Palmateer (1), (1) University of Florida, Homestead, FL, U.S.A.; (2) Chase Agricultural Consulting, LLC, Cottonwood, AZ, U.S.A.
- 252-P Combined Application of *Bacillus amyloliquefaciens* ZY-9-13 with Fungicides for Control of Tobacco Black Shank**
W. MU (1), J. XI (1), C. XUE (1), L. HU (1), J. SONG (1), (1) Zhengzhou Tobacco Research Institute of CNTC, China
- 253-P Laboratory and field evaluation of fungicides for management of *Phytophthora* blight of pumpkin, caused by *Phytophthora capsici***
M. BABADOOST (1), J. de Souza (2), T. Reboucas (2), Y. Xiang (1), (1) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.; (2) Department of Plant Science, Southwest Bahia University State, Vitória da Conquista 45700-000, Brazil
- 254-P Fungicide rotation schemes and Melcast for managing *Phytophthora* fruit rot of watermelon in Southeastern United States**
C. KOUSIK (1), D. Egel (2), P. Ji (3), L. Quesada-Ocampo (4), (1) U.S. Department of Agriculture, Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.; (2) Purdue University, Vincennes, IN, U.S.A.; (3) University of Georgia, Tifton, GA, U.S.A.; (4) North Carolina State University, Raleigh, NC, U.S.A.
- 255-P WITHDRAWN**
- 256-P Monitoring Pennsylvania orchards for the presence of streptomycin resistant *Erwinia amylovora*.**
H. LAUKAITIS (1), B. Lehman (2), K. Peter (2), M. Baer-Lehman (1), (1) Shippensburg University, Shippensburg, PA, U.S.A.; (2) Pennsylvania State University Fruit Research and Extension Center, Biglerville, PA, U.S.A.

- 257-P Effect of kasugamycin application on bacterial resistance to kasugamycin and cross resistance with other antibiotics**
S. GEBBEN (1), S. Gebben (2), G. McGhee (2), G. Sundin (2), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Michigan State University, U.S.A.
- 258-P Fungicide sensitivity in the wild rice pathogen *Bipolaris oryzae***
C. CASTELL-MILLER (1), D. Samac (2), (1) PLPA/UMN, U.S.A.; (2) USDA ARS, U.S.A.
- 259-P High-throughput strobilurin sensitivity testing of *R. solani* on Louisiana rice confirms reduced azoxystrobin but continued trifloxystrobin sensitivity**
A. LUNOS (1), C. Hollier (1), L. Brooks (1), S. Harding (1), (1) Dept. of Plant Pathology & Crop Physiology, LSU AgCenter, Baton Rouge, LA, U.S.A.
- 260-P Resistance to quinone outside inhibitor fungicides in *Cercospora sojina* in Ohio**
L. WEBER (1), A. Dorrance (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 261-P Evaluating fungicide sensitivity of regional populations of *Blumeria graminis* f.sp. *tritici* in the United States**
E. MEYERS (1), C. Cowger (2), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) USDA-ARS Plant Science Research Unit & North Carolina State University, Raleigh, NC, U.S.A.
- 262-P Baseline sensitivities of *Rhizopus stolonifer* and first effective fungicides for management of almond hull rot in California**
S. HAACK (1), H. Förster (1), J. Adaskaveg (1), (1) University of California, Riverside, Riverside, CA, U.S.A.
- 263-P Sensitivity of *Neofabraea spp* strain to newly registered fungicides.**
P. SIKDAR (1), M. Mazzola (2), (1) Washington State University, Wenatchee, WA, U.S.A.; (2) USDA-ARS, Wenatchee, WA, U.S.A.
- 264-P Baseline sensitivities to SDHI fungicides and characterization of the *sdbB* gene in *Venturia inaequalis***
S. VILLANI (1), K. Ayer (2), K. Cox (2), (1) North Carolina State University, Mills River, NC, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.
- 265-P WITHDRAWN**
- 266-P Assessment of QoI Resistance in *Colletotrichum spp.* Isolated from Boxthorn and Apple in Korea**
S. KIM (1), J. Min (1), D. Back (1), H. Kim (1), S. Lee (1), K. Kim (1), (1) Chungbuk National University, Korea
- 267-P Characterization of fungicide resistance phenotypes in *Botrytis cinerea* populations from blueberry in Florida**
A. AMIRI (1), A. Zuniga (2), P. Harmon (2), N. Peres (2), (1) Washington State University, Wenatchee, WA, U.S.A.; (2) University of Florida, FL, U.S.A.; (3) University of Florida, Gainesville, FL, U.S.A.; (4) University of Florida, Wimauma, FL, U.S.A.
- 268-P Baseline sensitivity of *Phyllosticta citricarpa* isolates from Florida to succinate dehydrogenase inhibitor fungicides *in vitro* study**
K. NICOLETTA (1), M. Dewdney (1), (1) University of Florida, Citrus Research and Education Center, Lake Alfred, FL, U.S.A.
- 269-P Screening for QoI resistance among *Colletotrichum* species associated with ripe rot of grape in Virginia vineyards**
M. NITA (1), A. Bly (1), (1) Virginia Tech, U.S.A.
- 270-P Detection of quinone outside inhibitor resistant isolates of *Erysiphe necator* in Oregon vineyards**
B. WARNEKE (1), J. Yamagata (2), T. Neill (3), T. Miles (2), W. Mahaffee (3), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) California State University Monterey Bay, Seaside, CA, U.S.A.; (3) USDA-ARS, Corvallis, OR, U.S.A.
- 271-P Characterization of resistance to DMI fungicides in *Colletotrichum spp.* isolates from peach**
S. CHEN (1), C. Luo (1), M. Hu (2), G. Schnabel (2), (1) Huazhong Agricultural University, China; (2) Clemson University, U.S.A.
- 272-P In-vitro azoxystrobin sensitivity of *Colletotrichum gloeosporioides* isolates from blueberry in north and central Florida**
M. VELEZ-CLIMENT (1), P. Harmon (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 273-P Fungicide sensitivity of *Monilinia vaccinii-corymbosi* in highbush blueberries in Michigan**
K. FITZGERALD (1), J. Gillett (1), A. Schilder (1), (1) Michigan State University, East Lansing, MI, U.S.A.
- 274-P Induced overexpression of the gene *MfCYP51* may reveal molecular mechanisms associated to tebuconazole resistance of *Monilinia fructicola* in Brazil.**
P. LICHTENBERG (1), Y. Luo (1), T. Michailides (1), L. May De Mio (2), (1) University of California - Davis, Parlier, CA, U.S.A.; (2) Universidade Federal do Paraná, Curitiba, Brazil
- 275-P Profiling of Resistance to SDHI Fungicides in *Botrytis cinerea* from Strawberry Fields**
M. HU (1), D. Fernández-Ortuño (2), G. SCHNABEL (1), (1) Clemson University, U.S.A.; (2) Universidad de Málaga, Spain
- 276-P Resistance of *Colletotrichum gloeosporioides* from strawberry to azoxystrobin and reduced-sensitivity to thiophanate-methyl**
M. OLIVEIRA (1), M. Chamorro (1), N. Peres (1), (1) University of Florida, Wimauma, FL, U.S.A.
- 277-P Increased frequency of multifungicide resistance in *Botrytis cinerea***
M. HU (1), G. Schnabel (1), (1) Clemson University, U.S.A.; (2) Clemson University, Clemson, SC, U.S.A.
- 278-P Resistance of *Botrytis cinerea* to fungicides in California strawberries**
S. COSSEBOOM (1), G. Schnabel (2), K. Ivors (1), G. Holmes (1), (1) Cal Poly State University, San Luis Obispo, CA, U.S.A.; (2) Clemson University, Clemson, SC, U.S.A.
- 279-P Monitoring *Colletotrichum acutatum* Resistance to Quinone-outside Inhibitor Fungicides in Strawberry**
B. FORCELINI (1), B. Forcelini (1), N. Peres (1), (1) University of Florida, Wimauma, FL, U.S.A.
- 280-P Sensitivity of *Sclerotinia sclerotiorum* to thiophanate-methyl, fluazinam, and procymidone.**
M. Lehner (1), R. Silva (1), T. Paula Jr. (2), E. Mizubuti (1), (1) Universidade Federal de Vicosa, Brazil; (2) EPAMIG, Brazil
- 281-P Sensitivity of *Sclerotinia sclerotiorum* to iprodione and propiconazole in Bangladesh**
M. ISLAM (1), C. Vrisman (1), S. Miller (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 282-P Presence of fungicide resistant *Botrytis* strains in Norwegian forest nurseries**
G. STRØMENG (1), V. Tälge (1), I. Fløistad (1), (1) NIBIO, Ås, Norway
- 283-P WITHDRAWN**
- 284-P Fungicide resistance in populations of *Fusarium proliferatum* causing bulb rot of onion in the Pacific Northwest.**
K. FAIRCHILD (1), S. Windes (1), A. Malek (1), J. Woodhall (2), P. Wharton (1), (1) University of Idaho, Aberdeen, ID, U.S.A.; (2) University of Idaho, Parma, ID, U.S.A.
- 285-P Sensitivity of *Podosphaera xanthii* isolates from Illinois to fungicides**
Y. XIANG (1), M. Babadoost (2), (1) University of Illinois, Urbana-Champaign, Urbana, IL, U.S.A.; (2) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.
- 286-P WITHDRAWN**
- 287-P *Podosphaera xanthii* strains with resistance and reduced sensitivity to several fungicides may challenge control of cucurbit powdery mildew**
M. MCGRATH (1), (1) Cornell University, Riverhead, NY, U.S.A.

288-P Fungicide resistance profiles and virulence of *Stagonosporopsis* species isolates from watermelon and melon in eastern China

M. NEWARK (1), N. Dufault (1), M. Paret (2), L. Pingfang (3), X. Yang (3), (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, Quincy, FL, U.S.A.; (3) Jiangsu Academy of Agricultural Science, Nanjing, China

289-P Investigating dynamics of QoI fungicide resistance in potato early blight complex pathogens in Wisconsin

S. DING (1), K. Meinholz (1), A. Gevens (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.

290-P Sensitivity of *Alternaria* spp. causing diseases in tomato and potato to boscalid and azoxystrobin

C. VRISMAN (1), M. Islam (1), S. Miller (1), (1) The Ohio State University, Wooster, OH, U.S.A.

291-P Fungicide sensitivity of *Pythium* species from the North Central Region of the United States

R. MATTHIJSSEN (1), A. Robertson (1), M. Chilvers (2), (1) Iowa State University, Ames, IA, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.

292-P *Pythium* species causing damping-off of alfalfa in Minnesota: Identification, pathogenicity and fungicide sensitivity

D. SAMAC (1), L. Berg (2), L. Radmer (2), (1) USDA-ARS, Saint Paul, MN, U.S.A.; (2) University of Minnesota, Saint Paul, MN, U.S.A.

293-P WITHDRAWN

294-P G143A mutation in cytochrome *b* is found in azoxystrobin resistant *Phytophthora cactorum* but not in resistant *Phytophthora nicotianae* from strawberry.

T. SEIJO (1), E. Zuchelli (2), N. Peres (1), (1) University of Florida - GCREC, Wimauma, FL, U.S.A.; (2) Universidade de Passo Fundo, Passo Fundo, Brazil

295-P Prevalence of metalaxyl resistance in *Pythium* populations in dryland agriculture in the US Pacific Northwest

W. CHEN (1), S. Guy (2), R. McGee (3), T. Paulitz (1), L. Porter (4), K. Schroeder (5), G. Vandemark (1), (1) USDA ARS, Washington State University, Pullman, WA, U.S.A.; (2) Washington State University, Pullman, WA, U.S.A.; (3) USDA ARS, Pullman, WA, U.S.A.; (4) USDA ARS, Washington State University, Prosser, WA, U.S.A.; (5) University of Idaho, Moscow, ID, U.S.A.

296-P Screening for phenylamide fungicide insensitivity in Wisconsin hop downy mildew (*Pseudoperonospora humuli*) populations

M. MARKS (1), A. Gevens (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.

297-P Production of *Phytophthora nicotianae* isolates resistant to oxathiapiprolin

R. BITTNER (1), A. Mila (1), (1) North Carolina State University, U.S.A.

298-P Management of mefenoxam-resistant isolates of *Pythium ultimum* causing pythium leak on potato in the Pacific Northwest.

I. CARRILLO (1), P. Wharton (1), K. Fairchild (1), L. Porter (2), K. Frost (3), P. Hamm (3), (1) University of Idaho, Aberdeen, ID, U.S.A.; (2) USDA-ARS, Prosser, WA, U.S.A.; (3) Oregon State University, Hermiston, OR, U.S.A.

299-P Oxathiapiprolin baseline sensitivity distribution of *Phytophthora capsici* isolates.

G. OLAYA (1), R. Linley (2), K. Edlebeck (2), S. Kousik (3), P. Kuhn (4), (1) Syngenta, Vero Beach, FL, U.S.A.; (2) Syngenta, Vero Beach, FL, U.S.A.; (3) USDA-ARS, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.; (4) Syngenta, Greensboro, NC, U.S.A.

300-P Fungicide sensitivity of *Phytophthora infestans* isolates collected in Colombia

M. PARRA-BASTIDAS (1), L. Cabrera-Villamizar (1), J. Chirivi-Salomon (1), C. Núñez (2), S. Restrepo (1), G. Danies (1), (1) Universidad de los Andes, Colombia; (2) Universidad Nacional de Colombia, Colombia

301-P Assessment of acquired resistance of originally sensitive isolates of *Phytophthora infestans* to the systemic fungicides fluopicolide and propamocarb

J. GONZÁLEZ-TOBÓN (1), J. Chirivi-Salomon (1), M. Parra-Bastidas (1),

R. Childers (2), S. Restrepo (1), G. Danies (1), (1) Universidad de los Andes, Colombia; (2) Harvard University, U.S.A.

Cultural Control

302-P Fertigation and soil acidification sustain root density of huanglongbing-infected trees in Florida citrus groves

J. GRAHAM (1), E. Johnson (1), K. Gerberich (2), D. Bright (1), (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Florida, Lake Alfred, FL, Canada

303-P Status of Huanglongbing (HLB) (citrus greening) Multi Agency Coordination (MAC) projects on thermal treatment of citrus trees with citrus greening

D. KOMM (1), D. Komm (2), R. Ehsani (3), (1) USDA PPQ CPHST, Raleigh, NC, U.S.A.; (2) USDA, Raleigh, NC, U.S.A.; (3) University of Florida, Lake Alfred, FL, U.S.A.

304-P Canopy and root response of HLB-affected citrus trees to steam-generated thermotherapy

N. THAPA (1), S. Commerford (1), R. Ehsani (1), E. Johnson (1), M. Dewdney (1), (1) CREC, University of Florida, Lake Alfred, FL, U.S.A.

305-P Inoculum sources of *Xanthomonas fragariae* in strawberry nursery packing houses: presence, viability and transmission

H. WANG (1), C. Gigot (2), N. McRoberts (2), W. Turechek (3), (1) EDISTO Research and Education Center, Clemson University, Blackville, SC, U.S.A.; (2) University of California, Davis, CA, U.S.A.; (3) U.S. Horticultural Research Laboratory, USDA, Fort Pierce, FL, U.S.A.

306-P Assessment of *in-vitro* efficacy of different disinfectants against common bacterial diseases on woody ornamentals

P. LIYANAPATHIRANAGE (1), S. Dawadi (1), M. Kabir (2), T. Simmons (1), F. Baysal-Gurel (1), (1) Tennessee State University, Nashville, TN, U.S.A.; (2) Tennessee State University, TN, U.S.A.

307-P Effective treatments for eradication of *Xanthomonas cucurbitae* in pumpkin seed

X. ZHANG (1), M. Babadoost (2), (1) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.; (2) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.

308-P Silicon Augments *Xanthomonas gardneri* symptoms in Tomato cv. Early Girl

W. ZELLNER (1), C. Krause (2), J. Locke (1), J. Boldt (1), S. Leisner (3), (1) USDA-ARS, Toledo, OH, U.S.A.; (2) USDA-ARS, Wooster, OH, U.S.A.; (3) The University of Toledo, Toledo, OH, U.S.A.

309-P Study of the influence of winter rye on soybean seedling and root rot diseases

G. ARALDI-DA-SILVA (1), T. Kaspar (2), M. Helmers (1), D. Mueller (1), L. Leandro (1), (1) Iowa State University, AMES, IA, U.S.A.; (2) USDA, AMES, IA, U.S.A.

310-P Reduced *Macrophomina phaseolina* colonization of soybean by supplementing with the secondary nutrients calcium and magnesium

T. WILKERSON (1), M. Tomaso-Peterson (2), B. Golden (3), A. Brown (4), T. Allen (3), (1) Mississippi State University, Stoneville, MS, U.S.A.; (2) Mississippi State University, Starkville, MS, U.S.A.; (3) Mississippi State University Delta Research and Extension Center, Stoneville, MS, U.S.A.; (4) Mississippi State Chemical Lab/ Mississippi State University, Starkville, MS, U.S.A.

311-P Evaluating biodegradation treatments for the reduction of inoculum and incidence of citrus black spot *Phyllosticta citricarpa* in Florida citrus groves

K. RODRIGUES (1), T. Hobbs (1), M. Dewdney (1), (1) CREC, University of Florida, Lake Alfred, FL, U.S.A.

312-P Utility of compost tea for disease management in grapes.

G. KOTAMRAJU (1), R. Sysak (1), J. Gillett (1), A. Schilder (1), (1) Michigan State University, East Lansing, MI, U.S.A.

313-P Evaluation of disinfectant treatments to reduce transmission of *Didymella bryoniae* during watermelon grafting

A. KEINATH (1), V. DuBose (2), C. Conrad (2), (1) Clemson University, Charleston, SC, U.S.A.; (2) Clemson University, U.S.A.

314-P Scab severity in relation to hedge pruning pecan trees in the Southeastern USA

C. BOCK (1), M. Hotchkiss (1), T. Brenneman (2), K. Stevenson (2), B. Goff (3), M. Smith (4), L. Wells (5), B. Wood (1), (1) USDA-ARS SE Fruit & Tree Nut Research Laboratory, Byron, GA, U.S.A.; (2) Department of Plant Pathology, University of Georgia, Tifton, GA, U.S.A.; (3) Department of Horticulture, Auburn University, Auburn, AL, U.S.A.; (4) Department of Horticulture, Oklahoma State University, Stillwater, OK, U.S.A.; (5) Department of Horticulture, University of Georgia, Tifton, GA, U.S.A.

315-P Potential of heat treatment for management of *Botrytis cinerea* resistance on strawberry

A. ZUNIGA (1), N. Peres (1), (1) University of Florida, Wimauma, FL, U.S.A.

316-P WITHDRAWN**317-P Eradication of the boxwood blight pathogen, *Calonectria pseudonaviculata*, in compost**

R. HARVEY (1), D. Davis (1), J. Pecchia (1), (1) Penn State University, U.S.A.

318-P Thermal inactivation of *Calonectria pseudonaviculata*, the causal agent of boxwood blight

M. MILLER (1), M. Cubeta (2), (1) North Carolina State University, Department of Plant Pathology, Raleigh, NC, U.S.A.; (2) North Carolina State University, Raleigh, NC, U.S.A.

319-P Using soil amendments to reduce survival of *Botrytis cinerea* sclerotia in Mid-Atlantic diversified farming systems

E. KOIVUNEN (1), E. Koivunen (1), C. Swett (1), (1) University of Maryland, College Park, MD, U.S.A.

320-P Nutrients and *in vitro* growth of *Phaeocryptopus gaeumannii*, a fungus causing the Swiss needle cast disease on *Pseudotsuga menziesii*

M. YANEZ-MORALES (1), O. Salgado-Feregrino (1), J. Velázquez-Mendoza (1), M. Jiménez-Casas (1), (1) Colegio de Postgraduados, Texcoco, Mexico

321-P Adapting to water insecurity: Co-managing oomycete pathogens and water use using deficit irrigation sensor networks

J. DEL CASTILLO MÚNERA (1), C. Swett (1), B. Belayneh (1), A. Ristvey (2), J. Lea-Cox (1), (1) University of Maryland, College Park, MD, U.S.A.; (2) University of Maryland, MD, U.S.A.

322-P Addition of supplemental spent lime to previously limed soils for control of *Aphanomyces* root rot on sugar beet

J. BRANTNER (1), (1) University of Minnesota, Crookston, MN, U.S.A.

Genetics of Resistance

323-P Assessment of genetic diversity and virulence spectrum of *Magnaporthe oryzae* population from sub-Saharan Africa

Y. LIAO (1), A. Strayer (1), . White (2), A. Mukherjee (2), W. Elmer (3), L. Ritchie (4), D. Clark (4), J. Freeman (4), J. Jones (1), M. Paret (4), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Analytical Chemistry, The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.; (3) Department of Plant Pathology and Ecology, The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.; (4) North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.

324-P Quantitative resistance loci identified for the bacterial blight causative agent, *Xanthomonas oryzae* pv. *oryzae*

A. HUERTA (1), E. Delorean (2), A. Bossa-Castro (2), C. Raghavan (3), R. Corral (2), V. Verdier (3), H. Leung (5), J. Leach (2), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) Department of Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins, CO, U.S.A.; (3) International Rice Research Institute (IRRI), Los Baños, Philippines; (4) Institut de Recherche pour le Développement IRD-CIRAD-UM2, Montpellier, France; (5) 2 International Rice Research Institute (IRRI), Los Baños, Philippines

325-P Accelerating the pace of developing FHB resistant two-row malting barley: genomic selection approach

D. FERNANDO (1), J. Tucker (2), A. Badea (2), W. Legge (2), (1) University of Manitoba, Winnipeg, MB, Canada; (2) Brandon Research and Development Centre, Agriculture and Agri-Food Canada, Brandon, MB, Canada

326-P Analysis of Resistance to Blast Isolates and Mapping of Rice Blast Resistance Gene in T2

Q. YANG (1), D. Sun (2), G. Chen (2), J. Zhang (2), D. Zhou (3), X. Zhu (2), H. Wang (3), Z. Chen (3), (1) Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, Guangzhou, Other, China; (2) Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, China; (3) South China Agricultural University, China

327-P Exploring gene loci controlling bakanae disease resistance by genome-wide association mapping

S. CHEN (1), K. Huang (2), Y. Kuo (2), M. Lai (3), D. Wu (3), C. Chung (1), (1) Department of Plant Pathology and Microbiology, National Taiwan University, Taipei, Taiwan; (2) Department of Bio-Industrial Mechatronics Engineering, National Taiwan University, Taipei, Taiwan; (3) Crop Science Division, Taiwan Agricultural Research Institute, Taichung, Taiwan

328-P QTL Mapping of Resistance to Tan Spot in a Winter Recombinant Inbred Line Population Derived from Cross between Harry and Wesley

G. KARIYAWASAM (1), W. Hussain (2), A. Easterly (2), M. Guttieri (2), V. Belamkar (3), J. Venegas (2), S. Baenziger (2), J. Poland (4), J. Faris (5), S. Xu (5), J. Rasmussen (1), Z. Liu (1), (1) North Dakota State University, Fargo, U.S.A.; (2) University of Nebraska, Lincoln, U.S.A.; (3) University of Nebraska, U.S.A.; (4) Kansas State University, Manhattan, KS, U.S.A.; (5) USDA-ARS, Northern Crop Science Laboratory, Fargo, ND, U.S.A.; (6) North Dakota State University, Fargo, ND, U.S.A.

329-P Molecular mapping of effective stripe rust resistance genes in wheat germplasm PI 182126

X. CHEN (1), J. Feng (2), M. Wang (3), (1) USDA-ARS and Washington State University, U.S.A.; (2) Department of Plant Pathology, Washington State University, Pullman, WA, U.S.A.; (3) Department of Plant Pathologist, Washington State University, Pullman, WA, U.S.A.

330-P WITHDRAWN**331-P SNP variation in switchgrass disease resistance genes**

B. BAHRI (1), G. Daverdin (2), J. Cheng (3), K. Barry (3), S. Smith (4), K. Devos (5), (1) Dept. of Plant Protection, National Agronomic Institute of Tunisia/ Dept. of Crop and Soil Sciences, University of Georgia, U.S.A.; (2) Marucci Center for Blueberry & Cranberry Research and Extension, Rutgers University, Chatsworth, NJ, U.S.A.; (3) DOE Joint Genome Institute, Walnut Creek, California, CA, U.S.A.; (4) Dept. of Plant Pathology, University of Georgia, Athens, GA, U.S.A.; (5) Institute of Plant Breeding, Genetics and Genomics, Dept of Crop and Soil Sciences, University of Georgia, Athens, GA, U.S.A.

332-P WITHDRAWN**333-P Development of molecular makers for spinach resistance genes to downy mildew disease**

C. FENG (1), J. Correll (1), K. Saito (1), K. Kammeijer (2), S. Koike (3), (1) University of Arkansas, U.S.A.; (2) University of California, U.S.A.; (3) University of California Cooperative Extension—Monterey County, U.S.A.

334-P Genome-wide association study of transmission of Soybean mosaic virus through seed

Q. LIU (1), H. Hobbs (1), L. Domier (2), (1) University of Illinois, U.S.A.; (2) USDA-ARS, University of Illinois, U.S.A.

335-P Genetic analysis and molecular mapping of QTLs for resistance to rice black-streaked dwarf disease in rice

T. ZHOU (1), T. Zhou (1), (1) Jiangsu academy of agricultural sciences, China

336-P Identification of resistance genes and resistance gene analogs by si-RNA sequencing of the sweet potato leaf phytobiome

A. ALLEYNE (1), A. Alleyne (2), M. James (3), D. Gutierrez (4), S. Fuentes (4), (1) The University of the West Indies- Cave Hill Campus, Bridgetown, Other, Barbados; (2) The University of the West Indies-Cave Hill Campus, Bridgetown, Other, Barbados; (3) Ministry of Agriculture, Food and Water Resources, Plant Pathology Section, Graeme Hall, Barbados, Barbados; (4) International Potato Center (CIP), Virology Laboratory, Lima, Peru

337-P Differential effects of stalk rot diseases on photosystem II photochemical efficiency among resistant and susceptible sorghum lines.

A. BANDARA (1), D. Weerasooriya (1), T. Tesso (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.

- 338-P Two SREBP Transcription Factors are Required for Ergosterol Biosynthesis and DMI Resistance in *Penicillium digitatum***
R. RUAN (1), (1) Institute of Biotechnology, Zhejiang University, Hangzhou, China
- 339-P Chemical association of potato susceptibility to *Rhizoctonia solani***
H. JIANG (1), H. Jiang (1), J. Hao (1), X. Zhang (2), (1) University of Maine, Orono, ME, U.S.A.; (2) Inner Mongolia Agricultural University, Hohhot, China
- 340-P Genetic characterization of quantitative resistance to *Bremia lactucae*, the causal organism of lettuce downy mildew.**
L. PARRA (1), I. Simko (2), R. Michelmore (3), (1) UC Davis- Genome center, Davis, CA, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.; (3) UC Davis- Genome Center, Davis, U.S.A.
- 341-P Exserohilum turcicum races causing northern leaf blight of corn in the North Central United States**
J. WEEMS (1), C. Bradley (1), (1) University of Kentucky, Princeton, KY, U.S.A.
- 342-P Wheat yellow rust dynamics in Tunisia since 2013 and resistance genes in durum wheat**
B. BAHRI (1), M. Leconte (2), S. Hamza (1), C. de Vallavieille Pope (2), (1) National Agronomic Institute of Tunisia, tunis, Tunisia; (2) UMR BIOGER, INRA, AgroParisTech, Université Paris-Saclay, Thiverval-Grignon, France
- 343-P Effectiveness of adult plant resistance to wheat stem rust is specific to *Puccinia graminis* f. sp. *tritici* race**
M. ROUSE (1), J. Briggs (2), (1) USDA-ARS, Saint Paul, MN, U.S.A.; (2) University of Minnesota, Saint Paul, MN, U.S.A.
- 344-P Lack of interaction between *Fusarium oxysporum* f. sp. *niveum* and *Meloidogyne incognita* on cucurbit rootstocks resistant to *Fusarium* wilt of watermelon**
A. KEINATH (1), P. Agudelo (1), (1) Clemson University, U.S.A.; (2) Clemson University, Clemson, SC, U.S.A.
- 345-P Adaptation to quantitative resistance in the hop cultivar Cascade by *Podosphaera macularis***
D. GENT (1), D. Gent (1), M. Twomey (2), S. Wolfenbarger (2), (1) USDA Agricultural Research Service, Corvallis, OR, U.S.A.; (2) Oregon State University Department of Botany and Plant Pathology, Corvallis, OR, U.S.A.
- 346-P Gene-For-Gene in Fusiform Rust Disease of Loblolly Pine**
K. SMITH (1), D. Ence (2), D. Nelson (3), M. Yandell (2), J. Davis (4), (1) USDA Forest Service, Gainesville, FL, U.S.A.; (2) University of Utah, U.S.A.; (3) USDA Forest Service, U.S.A.; (4) University of Florida, U.S.A.
- 347-P Melampsora rust running amuck: Exploring willow rust population diversity in the Northeast United States.**
C. CROWELL (1), M. Bekauri (1), C. Carlson (2), F. Gouker (2), L. Smart (2), C. Smart (1), (1) Cornell University Plant Pathology and Plant-Microbe Biology Section, U.S.A.; (2) Cornell University Horticulture Section, U.S.A.
- 348-P Marker development and fine-mapping for the *Phytophthora* crown rot resistance locus, *Pc1*, in strawberry**
Y. NOH (1), J. Mangandi (1), S. Verma (1), V. Whitaker (1), S. Isobe (2), J. Cha (3), S. Lee (1), (1) University of Florida, Wimauma, FL, U.S.A.; (2) Kazusa DNA Research Institute, Kisarazu, Japan; (3) Chungbuk National University, Cheongju, South Korea
- 349-P Mitigating the effects of shoot blight caused by *Erwinia amylovora* by enhancing plant systemic resistance**
B. LEHMAN (1), C. Bower (1), K. Peter (1), (1) Penn State University, Biglerville, PA, U.S.A.
- 350-P Induction of resistance in cultivated peanut against peanut early leaf spot by salicylic acid**
K. BOWEN (1), L. Gong (2), (1) Auburn University, Auburn, AL, U.S.A.; (2) Auburn University, U.S.A.
- 351-P Development of a molecular marker platform for the breeding of blast resistance varieties in Taiwan**
W. CHEN (1), W. Shen (1), F. Chang (2), W. Chang (3), Z. Yu (1), J. Liao (1), M. Lai (4), C. Wu (2), C. Chung (1), (1) National Taiwan University, Taiwan; (2) Kaohsiung District Agricultural Research and Extension Station, Taiwan; (3) Taoyuan District Agricultural Research and Extension Station, Taiwan; (4) Taiwan Agricultural Research Institute, Taiwan
- 352-P Introgression of crown rot resistance into cultivated squash *Cucurbita moschata*, *C. maxima* and *C. agryosperma***
S. ZHANG (1), Y. Fu (1), P. Moon (1), C. Waddill (1), (1) Tropical Research and Education Center, University of Florida, IFAS, U.S.A.
- 353-P WITHDRAWN**
- 354-P Transgenic expression of pattern recognition receptor *EFR* in tomato leads to effective field resistance to bacterial wilt**
S. KUNWAR (1), S. Kunwar (1), E. Evaristo da Silva (2), F. Iriarte (2), L. Ritchie (2), D. Clark (2), J. Freeman (2), R. Stall (3), J. Jones (3), J. Minsavage (3), C. Zipfel (4), D. Horvath (5), M. Paret (2), (1) University of Florida, Gainesville, FL, U.S.A.; (2) North Florida Research and Education Center, University of Florida, U.S.A.; (3) University of Florida, U.S.A.; (4) The Sainsbury Laboratory, Norwich, UK, United Kingdom; (5) Two Blades Foundation, U.S.A.
- 355-P Plant defensins inhibit growth of pathogens in the alfalfa crown rot disease complex**
A. SATHOFF (1), D. Samac (2), (1) University of Minnesota, Saint Paul, MN, U.S.A.; (2) USDA-ARS, Saint Paul, MN, U.S.A.
- 356-P A novel vector system to engineer begomovirus resistance in transgenic plants by transcriptional and post-transcriptional gene-silencing mechanisms**
C. TAI (1), J. Chen (2), F. Jan (1), (1) Department of Plant Pathology, National Chung Hsing University, Taichung, Taiwan; (2) Department of Agronomy, National Chung Hsing University, Taichung, Taiwan
- 357-P Exploiting the approaches of biotechnology in sweetpotato for virus diseases resistance**
Y. MENG (1), Y. Meng (2), C. Zhang (2), V. Njiti (2), (1) Alcorn State University, MS, U.S.A.; (2) Alcorn State University, U.S.A.
- 358-P Screening hard red spring wheat breeding lines for bacterial leaf streak resistance**
D. Yabwalo (1), J. Thomas (2), K. Glover (1) (1) South Dakota State University, U.S.A.; (2) South Dakota State University, U.S.
- 359-P Identifying onion cultivars with reduced susceptibility to center rot**
J. MAZZONE (1), B. Gugino (2), M. Mansfield (2), (1) The Pennsylvania State University, State College, PA, U.S.A.; (2) The Pennsylvania State University, U.S.A.
- 360-P Early detection of adult plant resistance to oat crown rust using a qPCR assay**
B. YIMER (1), B. Yimer (2), T. Gordon (2), J. Bonman (2), (1) USDA-ARS, Pocatello, ID, U.S.A.; (2) USDA-ARS, Aberdeen, ID, U.S.A.
- 361-P Response of sweet sorghum lines to stalk pathogens *Fusarium thapsinum* and *Macrophomina phaseolina***
D. FUNNELL-HARRIS (1), P. O'Neill (1), S. Sattler (1), (1) USDA-ARS; Grain, Forage and Bioenergy Research Unit, Lincoln, NE, U.S.A.
- 362-P Development and evaluation of germplasm lines resistant to *Sclerotinia* stem rot**
M. MCCAGHEY (1), M. McCaghey (1), J. Willbur (1), C. Grau (2), S. Chapman (2), B. Diers (3), C. Groves (2), A. Ranjan (2), M. Kabbage (2), D. Smith (1), (1) University of Wisconsin- Madison, Madison, WI, U.S.A.; (2) University of Wisconsin- Madison, U.S.A.; (3) University of Illinois- Urbana-Champaign, U.S.A.
- 363-P Exploring the slow rusting potential of wheat genotypes against leaf and strip rust of wheat**
M. RAZA (1), M. Khan (2), M. Yaseen (3), F. Nutter (4), (1) Department of Plant Pathology and Microbiology, Iowa State University of Science and Technology, Ames, IA, U.S.A.; (2) Department of Plant Pathology, University of Agriculture Faisalabad, Faisalabad, Other, Pakistan; (3) Department of Math & Stat, University of Agriculture Faisalabad, Faisalabad, Pakistan; (4) Department of Plant Pathology and Microbiology, Iowa State University of Science and Technology, Ames, IA, U.S.A.

364-P Resistance to *Claviceps purpurea* (Fr.) Tul. in the winter wheat lines “Robigus” and “Solstice”.

J. MENZIES (1), A. Gordon (2), D. O’Sullivan (3), (1) Agriculture and Agri-Food Canada, Morden, MB, Canada; (2) National Institute of Agricultural Botany, Cambridge, United Kingdom; (3) University of Reading, Reading, United Kingdom

365-P WITHDRAWN

366-P Monitoring of Leaf rust in seventeen Egyptian wheat cultivars during 2013/2014 and 2014/2015 seasons.

A. ABDELRHIM (1), M. Abou-Zeid (2), H. Abd-Alla (3), C. Cowger (4), A. El-Bana (3), M. Ismail (3), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Agriculture research center, Giza, Egypt, Giza, Other, Egypt; (3) Minia University, El-Minya, Egypt; (4) North Carolina State University, Raleigh, NC, U.S.A.

367-P Scab susceptibility of a provenance collection of pecan

C. BOCK (1), L. Graue (2), P. Conner (3), S. Burrell (1), M. Hotchkiss (1), D. Boykin (4), B. Wood (1), (1) USDA/ARS SE Fruit & Tree Nut Research Laboratory, Byron, GA, U.S.A.; (2) USDA/ARS Pecan Breeding and Genetics, Somerville, TX, U.S.A.; (3) University of Georgia, Tifton, GA, U.S.A.; (4) USDA-ARS, Stoneville, MS, U.S.A.

368-P WITHDRAWN

369-P WITHDRAWN

370-P Effectiveness of a seed plate assay evaluating charcoal rot resistance in soybean

M. DA SILVA (1), P. Chen (1), J. Rupe (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.

371-P Screening soybean germplasm for resistance to multiple *Fusarium* species

P. OKELLO (1), L. Hyronimus (1), A. Weber (1), A. Singh (2), F. Mathew (1), (1) South Dakota State University, Brookings, SD, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.

372-P Development of an *in vitro* bioassay to screen perennial Phlox germplasm for susceptibility to *Golovinomyces cichoracearum* (*Erysiphe cichoracearum*)

C. FARINAS (1), P. Jourdan (1), F. Peduto Hand (1), (1) The Ohio State University, Columbus, OH, U.S.A.

373-P Virulence of *Calonectria pseudonaviculata* and *C. henricotiae* isolates and screening for resistant boxwood cultivars in detached leaf assays

H. GUO (1), J. Crouch (2), M. Pooler (3), (1) USDA-ARS and Rutgers University, Beltsville, MD, U.S.A.; (2) USDA-ARS Systematic Mycology and Microbiology Laboratory, Beltsville, MD, U.S.A.; (3) USDA-ARS US National Arboretum, Beltsville, MD, U.S.A.

374-P Evaluating nine boxwood cultivars for susceptibility to *Calonectria pseudonaviculata* and *C. henricotiae*.

N. SHISHKOFF (1), (1) Foreign Disease Weed Science Research Unit/ARS/USDA, Frederick, MD, U.S.A.

375-P Susceptibility of *Buxus* accessions to the boxwood blight pathogen *Calonectria pseudonaviculata*

J. LAMONDIA (1), (1) The Connecticut Agricultural Experiment Station, Windsor, CT, U.S.A.

376-P Identification of *Brassica napus* plant introductions with resistance to pathogenicity group 4 of *Leptosphaeria maculans*

S. MANSOURIPOUR (1), L. del Rio Mendoza (1), (1) North Dakota State University, Fargo, ND, U.S.A.

377-P Evaluating chemical fingerprinting as a tool to rapidly screen hybrid chestnut for resistance to pathogens

A. CONRAD (1), J. Westbrook (2), T. Zhebentyayeva (3), L. Rodriguez-Saona (4), P. Bonello (4), C. Nelson (5), A. Abbott (1), (1) University of Kentucky, Lexington, KY, U.S.A.; (2) The American Chestnut Foundation, Asheville, NC, U.S.A.; (3) Clemson University, Clemson, SC, U.S.A.; (4) The Ohio State University, Columbus, OH, U.S.A.; (5) USDA Forest Service, Lexington, KY, U.S.A.

378-P Evaluation of Rice Varieties for Resistance for Autumn Decline in Arkansas

Y. WAMISHE (1), J. Hardke (1), T. Roberts (2), J. Allen (2), T. Gebremariam

(1), C. Kelsey (2), T. Mulaw (1), S. Belmar (2), (1) University of Arkansas, Little Rock, AR, U.S.A.; (2) University of Arkansas, Fayetteville, AR, U.S.A.

379-P Screening soybean germplasm for resistance towards *Pythium* species

K. SCOTT (1), M. Eyre (1), A. Dorrance (1), (1) The Ohio State University, Wooster, OH, U.S.A.

380-P Disease susceptibility screening for cold-climate wine grape cultivars

D. JONES (FORMERLY SCHREINER), (1), P. McManus (2) (1) University of Wisconsin, Madison Dept. of Plant Pathology, Madison, WI, U.S.A.; (2) University of Wisconsin Madison Dept. of Plant Pathology, Madison, WI, U.S.A.

381-P WITHDRAWN

382-P Cavity spot of carrots: progress in screening for resistance

M. MCDONALD (1), M. McDonald (2), (1) University of Guelph, ON, Canada; (2) University of Guelph, Canada

383-P Screening of Wild Hop (*Humulus lupulus*) Germplasm for Identification of Resistance to *Pseudoperonospora humuli*

J. HAVILL (1), A. Orshinsky (1), D. Carter (1), S. Poulouse (1), (1) University of Minnesota, St. Paul, MN, U.S.A.

384-P Barley yellow dwarf incidence and bird cherry-oat aphid preference in four wheat varieties in Idaho

M. RASHIDI (1), J. Marshall (1), N. Bosque-Perez (2), A. Rashed (1), M. Rashidi (1), (1) University of Idaho, Aberdeen Research and Extension Center, Aberdeen, ID, U.S.A.; (2) University of Idaho, Department of Plant, Soil and Entomological Sciences, Moscow, ID, U.S.A.

385-P Resistance in pea to the *Bean leafroll virus*

L. PORTER (1), L. Porter (2), (1) USDA ARS, Prosser, WA, U.S.A.; (2) USDA-ARS, Prosser, WA, U.S.A.

386-P WITHDRAWN

387-P The SimpleSynteny Server: Genome Comparison Simplified

D. VELTRI (1), M. Malapi-Wight (2), J. Crouch (1), (1) USDA-ARS, Beltsville, MD, U.S.A.; (2) USDA-APHIS, Beltsville, MD, U.S.A.

Integrated Pest Management

388-P Reducing Mycotoxin Levels in Corn via Lepidopteran Insect Control and Application of Atoxicogenic Fungi

G. SCHUSTER (1), T. Mays (2), M. Sétamou (3), P. Porter (4), S. Nelson (5), (1) Texas A&M University - Kingsville/Texas A&M AgriLife Extension, Kingsville, TX, U.S.A.; (2) Texas A&M AgriLife Extension Service, Brownfield, TX, U.S.A.; (3) Texas A&M University-Kingsville Citrus Center, Weslaco, TX, U.S.A.; (4) Texas A&M AgriLife Extension Service, Lubbock, TX, U.S.A.; (5) Texas A&M University-Kingsville, Kingsville, TX, U.S.A.

389-P Deciphering soil and plant microbiomes associated with suppression of soybean diseases

H. PFAFFE (1), S. Marzano (1), L. Domier (1), A. Davis (1), D. Eastburn (1), (1) University of Illinois, Urbana, IL, U.S.A.

390-P Effects of fungicide application timing and cultivar resistance on *Fusarium* head blight and deoxynivalenol in winter wheat

C. BOLANOS-CARRIELI (1), S. Wegulo (1), H. Hallen-Adams (1), D. Funnell-Harris (2), P. Baenziger (1), (1) University of Nebraska, Lincoln, NE, U.S.A.; (2) USDA-ARS, U.S.A.

391-P Impact of Agronomic Practices and Diseases on Wheat Profitability

J. SALGADO (1), P. Paul (1), L. Lindsey (1), R. Minyo (1), (1) The Ohio State University, Wooster, OH, U.S.A.

392-P Effect of cropping rotation and input level over 18 years on the northern Great Plains

B. GOSSEN (1), K. Bassendowski (1), E. Johnson (2), R. Lemke (1), (1) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (2) University of Saskatchewan, Saskatoon, SK, Canada

- 393-P WITHDRAWN**
- 394-P Evaluation of management programs of yellowing and wilting of blackberry (*Rubus* sp.) caused by *Fusarium oxysporum* in Michoacan Mexico**
A. REBOLLAR-ALVITER (1), A. Hernandez-Cruz (2), A. Saldivia-Tejeda (3), (1) Universidad Autonoma Chapingo, Mexico; (2) Instituto Tecnologico del Valle de Morelia, Morelia, Mexico; (3) Universidad Autonoma Chapingo, Posgrado en Proteccion Vegetal, Mexico
- 395-P Response of grafted seedless watermelon to root regeneration and inoculation with *Fusarium oxysporum* f.sp. *niveum***
Q. Liu (1), X. Zhao (1), T. Sanchez (1), Z. Black (1), N. Dufault (1), Q. Liu (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 396-P Novel approaches for the integrated control of the soilborne strawberry pathogens *Macrophomina phaseolina* and *Fusarium oxysporum* f. sp. *fragariae***
M. CARTER (1), H. Smith (2), G. Holmes (3), K. Ivors (1), (1) California Polytechnic State University, San Luis Obispo, U.S.A.; (2) California Polytechnic State University, Statistics, San Luis Obispo, U.S.A.; (3) California Polytechnic State University Strawberry Center, San Luis Obispo, U.S.A.
- 397-P WITHDRAWN**
- 398-P Decision models for fungicide applications for frogeye leaf spot in soybean**
H. KELLY (1), (1) University of TN, JACKSON, TN, U.S.A.
- 399-P Controlling Asian Soybean Rust and Phytophthora Late Blight by Biologicals Alone and in Combination with Fungicides**
M. TWIZEYIMANA (1), (1) AgBiome, Inc., TRP, NC, U.S.A.
- 400-P Proactive Strategy for Management of Seedborne Pathogens of Pulse Crops in Montana**
B. AGINDOTAN (1), M. BURROWS (1), (1) Montana State University, Bozeman, MT, U.S.A.
- 401-P Production practices impact yield parameters and disease severity on sweet and forage sorghum grown as biomass feedstock**
A. HAGAN (1), K. Bowen (1), H. Miller (1), (1) Auburn University, Auburn, AL, U.S.A.
- 402-P Anthracnose impacts biomass and sugar yield of forage but not sweet sorghum**
C. TSUCHIDA (1), F. Martin (2), R. Gil (1), O. Ochoa (3), I. Simon (3), R. Michelmore (3), (1) Department of Plant Pathology, University of California, Davis, U.S.A.; (2) USDA-ARS, Salinas, U.S.A.; (3) Genome Center, University of California, Davis, U.S.A.
- 403-P Managing Rhizoctonia crown and root rot of sugar beets utilizing azoxystrobin-alternative fungicides in Nebraska.**
R. HARVESON (1), R. Harveson (2), (1) University of Nebraska Panhandle Research & Extension Center, Scottsbluff, NE, U.S.A.; (2) University of Nebraska Panhandle REC, Scottsbluff, NE, U.S.A.
- 404-P Monitoring pomegranate pathogens towards developing effective disease management program**
A. KC (1), G. Vallad (1), (1) University of Florida, Wimauma, FL, U.S.A.
- 405-P A meta-analysis of efficacy of anaerobic soil disinfection on soil borne pathogen suppression.**
U. SHRESTHA (1), R. Auge (1), A. Saxton (2), D. Butler (1), (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) University of Tennessee, Knoxville, TN, Nepal
- 406-P Evaluation of the weather-based spray advisory program MELCAST, fungicide alternations and mulch to manage watermelon diseases in Missouri**
Z. MERSHA (1), M. O'Connor (1), (1) Lincoln University - MO, Jefferson City, MO, U.S.A.
- 407-P Temporal variation of soil biota in fumigated and non-fumigated potato fields**
T. SMART (1), B. Geary (1), (1) Brigham Young University, Provo, UT, U.S.A.
- 408-P Effect of temperature and sugar beet growth stage on yellowing decline caused by *Fusarium secorum***
M. KHAN (1), (1) North Dakota State University and University of Minnesota, Fargo, ND, U.S.A.
- 409-P Management of wilt diseases on tomato by organically acceptable methods**
M. RAHMAN (1), M. Rahman (1), L. Jett (1), (1) West Virginia University, Morgantown, WV, U.S.A.
- 410-P Cryotherapy and Mini-plant Biological Indexing: New Tools for use in Citrus Clean Stock/Certification Programs**
C. RAMADUGU (1), M. Keremane (2), G. Volk (3), J. Hartung (4), G. McCollum (5), R. Lee (2), (1) University of California Riverside, Riverside, CA, U.S.A.; (2) USDA ARS National Clonal Germplasm Repository for Citrus and Dates, Riverside, CA, U.S.A.; (3) USDA ARS National Center for Genetic Resources Preservation, Fort Collins, CO, U.S.A.; (4) USDA ARS Molecular Plant Pathology, Beltsville, MD, U.S.A.; (5) USDA ARS US Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.
- 411-P *Bacillus mycoides* isolate J (BmJ): Plant protection through Systemic Acquired Resistance. A new option for plant disease management.**
S. OCKEY (1), B. Highland (2), B. Jacobsen (3), M. Dimock (2), (1) Certis USA, Yakima, WA, U.S.A.; (2) Certis USA, Columbia, MD, U.S.A.; (3) Montana State University, Bozeman, MT, U.S.A.
- 412-P Comparison of carbon quantity in anaerobic soil disinfection**
J. HONG (1), F. Di Gioia (2), M. Ozores-Hampton (2), E. Roskopf (1), (1) USDA ARS, Fort Pierce, FL, U.S.A.; (2) University of Florida, Institute of Food and Agricultural Sciences, South West Florida Research and Education Center, Immokalee, FL, U.S.A.
- 413-P WITHDRAWN**
- 414-P Practical resistance to mfenoxam in *Pythium aphanidermatum* and its impact on managing *Pythium* root rot in poinsettia cultivars**
E. LOOKABAUGH (1), B. Shew (1), (1) NC State University, Raleigh, NC, U.S.A.
- 415-P Evaluation of Commercial Hot and Bell Pepper Cultivars for Resistance to *Phytophthora capsici*.**
C. PARADA ROJAS (1), C. Parada Rojas (2), L. Quesada Ocampo (2), (1) North Carolina State University, Raleigh, NC, Colombia; (2) North Carolina State University, Raleigh, NC, U.S.A.
- 416-P Managing Potato Pink Rot Using Chemical and Non-Chemical Strategies**
X. ZHANG (1), J. Hao (1), H. Jiang (1), N. Marangoni (1), X. Zhang (1), (1) University of Maine, Orono, ME, U.S.A.
- 417-P The Nærstad model for potato late blight is available on the open source license technology platform VIPs**
B. NORDSKOG (1), A. Hermansen (1), V. Le (1), H. Eikemo (1), A. Hjelkrem (1), T. Skog (1), R. Nærstad (1), (1) Norwegian Institute of Bioeconomy Research, Ås, Norway
- 418-P Control of tulip mild mottle mosaic disease and tulip streak disease based on soil diagnostic**
M. KAZUMI (1), (1) Toyama Prefectural Agricultural, Forestry and Fisheries Research Center, Japan
- 419-P Management of *Tomato chlorotic spot virus*, an emerging tospovirus of tomato causing severe losses in south Florida**
S. ZHANG (1), Y. Fu (2), X. Fan (2), D. Seal (2), Q. Wang (3), E. McAvoy (4), (1) Tropical Research and Education Center, University of Florida, IFAS, Homestead, FL, U.S.A.; (2) Tropical Research and Education Center, University of Florida, IFAS, U.S.A.; (3) UF/IFAS Miami-Dade County Extension, U.S.A.; (4) UF/IFAS Hendry County Extension, U.S.A.

Regulatory Plant Pathology

420-P Variation within and among laboratories in detection of *Candidatus Liberibacter asiaticus* using qPCR

G. MCCOLLUM (1), C. Levesque (2), M. Keremane (3), M. Kunta (4), (1) USDA-Agricultural Research Service, Fort Pierce, FL, U.S.A.; (2) Citrus Research Board, Riverside, CA, U.S.A.; (3) USDA, ARS, Riverside, CA, U.S.A.; (4) Texas A&M University, Kingsville, TX, U.S.A.

421-P Regulatory implications of a newly discovered transmission mechanism for the pathogens that cause huanglongbing (citrus greening disease)

S. HALBERT (1), M. Keremane (2), C. Ramadugu (3), W. Dawson (4), J. Lee (5), J. Keesling (5), B. Singer (6), R. Lee (7), (1) Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL, U.S.A.; (2) USDA/ARS, National Clonal Germplasm Repository for Citrus and Dates, Riverside, CA, U.S.A.; (3) University of California, Riverside, Riverside, CA, U.S.A.; (4) Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.; (5) University of Florida Mathematics Department, Gainesville, FL, U.S.A.; (6) Emerging Pathogens Institute, University of Florida, Gainesville, FL, U.S.A.; (7) Retired, USDA/ARS, Peyton, CO, U.S.A.

422-P Known unknowns and unknown unknowns: fungi intercepted at the U.S. borders

M. ROMBERG (1), J. McKemy (1), (1) USDA APHIS PPQ, Beltsville, MD, U.S.A.

423-P Functional genomic analysis of *Botrytis cinerea* isolates from Ohio

V. VIJAYAKUMAR (1), B. Cottrell (1), H. Reynolds (1), J. Slot (1), F. Hand (1), G. Valero (1), C. Tomashuk (1), (1) The Ohio State University, Columbus, OH, U.S.A.

424-P WITHDRAWN

425-P Virus testing in certified strawberry nursery plants in Oregon

D. SHARMA-POUDYAL (1), S. Lane (1), J. Grant (1), N. Osterbauer (1), (1) Oregon Department of Agriculture, Salem, OR, U.S.A.

426-P National Seed Health Accreditation Pilot Program: monitoring seed health of seeds imported into the United States

T. BRUNS (1), G. Munkvold (2), A. McMellen-Brannigan (3), R. Dunkle (4), (1) Iowa State University Seed Science Center, Ames, IA, U.S.A.; (2) Iowa State University, U.S.A.; (3) USDA-APHIS, U.S.A.; (4) American Seed Trade Association, U.S.A.

Crop Loss Assessment

427-P Assessing Goss's bacterial wilt and leaf blight of corn in the High Plains of Texas with infrared aerial imagery.

J. WOODWARD (1), R. French-Monar (2), J. Todd (3), O. Moore (4), (1) Texas A&M AgriLife Extension, Lubbock, TX, U.S.A.; (2) Texas A&M AgriLife Extension, U.S.A.; (3) Todd Ag Consulting, Plainview, TX, U.S.A.; (4) High Plains Consulting, U.S.A.

428-P Understanding fungal reservoirs: tracking *Aspergillus* populations in air, soil, crop debris and the reproductive organs of Bt and non-Bt corn

H. ABBAS (1), M. Weaver (1), C. Accinelli (2), W. Shier (3), R. Zablutowicz (1), (1) USDA-ARS, Stoneville, MS, U.S.A.; (2) University of Bologna, Bologna, Italy; (3) University of Minnesota, Minneapolis, MN, U.S.A.

429-P Impact of stalk rot diseases on sweet sorghum sugar concentration and content.

A. BANDARA (1), T. Tesso (1), D. Wang (1), K. Zhang (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.

430-P WITHDRAWN

431-P Effect of planting date and peanut cultivar on leaf spot epidemics and pod yield

A. HAGAN (1), S. Scott (1), K. Bowen (1), (1) Auburn University, Auburn, AL, U.S.A.

432-P Fungal profiles in ginger root and cayenne pepper powders from U.S. retail

V. TOURNAS (1), J. Kohn (2), E. Katsoudas (2), (1) Center for Food Safety

and Applied Nutrition/FDA, U.S.A.; (2) Northeast Regional Lab/Office of Regulatory Affairs/FDA, U.S.A.

433-P Wheat streak mosaic virus differentially affects soft red winter wheat cultivars

B. HODGE (1), L. Stewart (2), P. Paul (3), (1) The Ohio State University, Columbus, OH, U.S.A.; (2) United States Department of Agriculture-Agricultural Research Service, Wooster, OH, U.S.A.; (3) The Ohio State University, Wooster, OH, U.S.A.

Disease Detection and Diagnosis

434-P Occurrence of a Citrus canker strain of limited host specificity in Texas

M. KUNTA (1), J. da Graça (1), B. Salas (2), D. Bartels (2), J. Park (1), G. Santillana (3), V. Mavrodieva (3), (1) Texas A&M University-Kingsville Citrus Center, Weslaco, TX, U.S.A.; (2) USDA APHIS PPQ CPHST Mission Laboratory, Edinburg, TX, U.S.A.; (3) CPHST Beltsville Laboratory USDA APHIS PPQ, Beltsville, MD, U.S.A.

435-P A new '*Candidatus Phytoplasma pini*'-related strain associated with witches'-broom of *Pinus* spp. is detected in Maryland

J. RASCOE (1), S. Costanzo (1), Y. Zhao (2), R. Davis (3), M. Nakhla (1), (1) USDA-APHIS-PPQ-CPHST, Beltsville, MD, U.S.A.; (2) USDA-ARS, Beltsville, MD, U.S.A.; (3) USDA-ARS, Beltsville, MD, U.S.A.

436-P The phytoplasma associated with purple woodnettle witches'-broom disease in Taiwan represents a new subgroup of the aster yellows phytoplasma group

F. JAN (1), Y. Tseng (1), C. Chang (2), (1) Department of Plant Pathology/National Chung Hsing University, Taiwan; (2) Department of Plant Pathology/University of Georgia, Taiwan

437-P Three races of *Xanthomonas campestris* pv. *vitians* causing bacterial leaf spot on lettuce identified.

C. BULL (1), M. Trent (2), R. Hayes (3), (1) Department of Plant Pathology and Environmental Microbiology, Penn State University, University Park, PA, U.S.A.; (2) USDA/ARS, Salinas, CA, U.S.A.; (3) USDA/ARS, Corvallis, OR, U.S.A.

438-P *Candidatus Liberibacter solanacearum* associated to *Physalis philadelphica*, a new solanaceous host

H. SILVA-ROJAS (1), A. Contreras-Rendon (2), J. Sanchez-Pale (2), (1) Colegio de Postgraduados, Mexico; (2) Universidad Autonoma del Estado de Mexico, Mexico

439-P WITHDRAWN

440-P Reporting the occurrence of *Ralstonia* based wilts of chillies in major vegetable growing areas of Punjab

A. HAMEED (1), S. Jameel (1), N. Liaqat (1), M. Ashfaq (2), R. Riaz (3), K. Riaz (1), (1) Department of Plant Pathology, University of Agriculture Faisalabad, Faisalabad, Other, Pakistan; (2) Department of Plant Pathology, PMAS-Arid Agriculture University Rawalpindi, Rawalpindi, Other, Pakistan; (3) Centre of Agricultural Biochemistry and Biotechnology, University of Agriculture, Faisalabad-38040, Pakistan, Faisalabad, Other, Pakistan

441-P Identification of the causal agents of soft rot of potato in Bangladesh and activity of biocontrol agents against the pathogens

E. GALARNEAU (1), C. Wallis (2), K. Baumgartner (2), (1) University of California-Davis, U.S.A.; (2) USDA-Agricultural Research Service, U.S.A.

442-P WITHDRAWN

443-P Morphological and molecular identification of *Phoma medicaginis* var. *medicaginis* causing spring black stem and leaf spot of alfalfa in Nevada

R. Bomberger (1), S. Wang (1), (1) Nevada Department of Agriculture, Sparks, NV, U.S.A.

444-P WITHDRAWN

445-P *Mycosphaerellaceae* associated with greasy spot of citrus in different climatic regions

A. VICENT (1), V. Aguilera-Cogley (2), J. Armengol (3), M. Berbegal (3), (1) Instituto Valenciano de Investigaciones Agrarias (IVIA), Moncada 46113, Valencia, Spain., Valencia, Other, Spain; (2) Laboratorio de Protección Vegetal, Instituto de Investigaciones Agropecuarias de Panamá (IDIAP), Los Canelos - Santa María, Panamá, Panama; (3) Instituto Agroforestal Mediterráneo, Universitat Politècnica de València. 46022, Valencia, Spain., Valencia, Spain

- 446-P First report of *Botrytis pseudocinerea* in blueberry fields in southern Chile**
E. BRICEÑO (1), E. Briceño (2), S. Aguirre (3), A. Behn (2), (1) Universidad Austral de Chile, Valdivia, Chile; (2) Universidad Austral Chile, Valdivia, Chile; (3) Univ austral Chile, Valdivia, Chile
- 447-P WITHDRAWN**
- 448-P Identifying and characterizing fungal pathogens causing seedling diseases of soybean through a multi-state survey**
A. WARNER (1), J. Bond (2), A. Fakhoury (2), (1) Southern Illinois University Carbondale, Carbondale, IL, U.S.A.; (2) Southern Illinois University Carbondale, U.S.A.
- 449-P Fusarium canker on holly in Norway**
G. STRØMENG (1), V. Tågø (1), A. Stensvand (1), J. Razzaghian (1), (1) NIBIO, Ås, Norway
- 450-P Fungal Diseases of *Stevia rebaudiana* Grown in Eastern Tennessee**
T. COLLINS (1), M. Dee (1), H. Korotkin (1), D. Hensley (1), B. Ownley (1), (1) University of Tennessee, Knoxville, TN, U.S.A.
- 451-P Interaction between a rust fungus and *Colletotrichum truncatum***
J. DIANESE (1), É. SOUZA (1), H. VALE (1), R. PEREIRA-CARVALHO (1), (1) DEPARTAMENTO DE FITOPATOLOGIA, UNIVERSIDADE DE BRASÍLIA, BRASÍLIA, Brazil
- 452-P Thielaviopsis punctulata Causes Black Scorch Disease on Date Palm in the United Arab Emirates**
F. ELAHI (1), (1) The Ohio state University, wooster, OH, U.S.A.
- 453-P Fungal Species Associated with Olive Dieback of Branches and Evaluation of Cultivar Resistance to Botryosphaeriaceae species**
J. MORAL (1), C. Agustí-Brisach (2), M. Pérez-Rodríguez (2), C. Xavier (2), A. Rhouma (3), A. Trapero (2), (1) University of California, Davis, Kearney Agricultural Research and Extension Center, Parlier, CA, U.S.A.; (2) Departamento de Agronomía, ETSIAM, Universidad de Córdoba, Campus de Rabanales, Edif. C4, 14071, Córdoba, Spain; (3) Lab. Improvement and protection of olive genetic resources, Olive Tree Institute, BP 208 Mahrajene 9 City– 1082, Tunis, Tunisia
- 454-P WITHDRAWN**
- 455-P Identification of Alternaria species associated with tomato and potato early blight disease in Oman**
H. MAYTON (1), A. Al-Rubaii (2), S. Al-Kaabi (2), M. Al-Jabri (2), R. Al-Maqbali (2), A. Al-Adawi (2), (1) Ministry of Agriculture and Fisheries Sultanate of Oman, Cornell University, Oman; (2) Ministry of Agriculture and Fisheries Sultanate of Oman, Oman
- 456-P Identification of a Candidate Causal Agent for Irregular Leaf Spot of Peanut**
E. CANTONWINE (1), S. Kim (2), Z. Abdo (3), A. Culbreath (2), (1) Valdosta State University, Valdosta, GA, U.S.A.; (2) University of Georgia, U.S.A.; (3) Colorado State University, U.S.A.
- 457-P Morphological and Molecular Characterization of Plant-Parasitic Nematodes Populations from Corn Fields in Ohio**
A. SIMON (1), T. Niblack (1), P. Paul (2), H. Lopez-Nicora (1), (1) OHIO STATE UNIVERSITY, COLUMBUS, OH, U.S.A.; (2) Ohio State University, Wooster, OH, U.S.A.
- 458-P WITHDRAWN**
- 459-P Vermiform plant-parasitic nematodes on soybean in North Dakota and their relationship with soybean cyst nematode**
G. YAN (1), G. Yan (2), A. Plaisance (3), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (3) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.
- 460-P Occurrence of *Phytophthora syringae* causing *Phytophthora* fruit rot in apple in Chile**
G. DÍAZ (1), M. Lolas (1), R. Méndez (1), J. Contreras (2), M. Caceres (1), (1) Universidad de Talca, Chile; (2) Universidad de Talca, Chile
- 461-P Phytophthora root and crown rot on field-grown lavender plants in 2015**
S. JEFFERS (1), S. Sharpe (1), M. Williamson (2), (1) Clemson University, Clemson, SC, U.S.A.; (2) Clemson University, Pendleton, SC, U.S.A.
- 462-P Four species of *Phytophthora* recovered from roots of American and hybrid chestnut seedlings and associated soils in the southeastern US**
S. SHARPE (1), S. Jeffers (1), S. Clark (2), (1) Clemson University, Clemson, SC, U.S.A.; (2) USDA Forest Service, Knoxville, TN, U.S.A.
- 463-P Two new races and several novel strains of the spinach downy mildew pathogen *Peronospora farinosa* f. sp. *spinaciae***
V. DEVI GANESHAN (1), S. Mutiga (2), F. Rotich (3), D. Mwongera (4), J. Harvey (5), B. Zhou (6), L. Wasilwa (7), G. Wang (1), D. Silue (8), O. Ibrahim (9), J. Correll (3), N. Talbot (10), T. Mitchell (1), (1) The Ohio State University, Department of Plant Pathology, Columbus, OH, U.S.A.; (10) University of Exeter, Department of Biosciences, United Kingdom; (2) Biosciences eastern and central Africa (BecA) Hub, Nairobi, Kenya; (3) University of Arkansas, Department of Plant Pathology, AR, U.S.A.; (4) University of Exeter, United Kingdom; (5) Biosciences eastern and central Africa (BecA) Hub, Kenya; (6) International Rice Research Institute, Philippines; (7) Kenya Agricultural and Livestock Research Organization, Kenya; (8) AfricaRice Center, Ivory Coast; (9) INERA, Burkina faso
- 464-P First report of tomato late blight disease in Oman**
H. MAYTON (3), S. Al-Kaabi (1), M. Al-Jabri (1), W. Al-Shibili (1), W. Fry (2), A. Al-Adawi (1), (1) Ministry of Agriculture and Fisheries Sultanate of Oman, Oman; (2) Cornell University, Ithaca, NY, U.S.A.; (3) Ministry of Agriculture and Fisheries Sultanate of Oman, Cornell University, Oman
- 465-P Red clover vein mosaic virus (RCVMV), a recently reported disease agent from alfalfa, cultivated crops and weeds in Saudi Arabia**
I. ALSHAHWAN (1), I. AlShahwan (2), (1) King Saud University, Riyadh, Saudi Arabia; (2) College of Food and Agric. Sciences, King Saud University, Riyadh, Saudi Arabia
- 466-P Rubus yellow net virus: an integrated element in the raspberry genome**
A. Diaz-Lara (1), N. Mosier (2), K. Keller (2), R. Martin (2), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS Horticultural Crops Research Unit, Corvallis, OR, U.S.A.
- 467-P Raspberry leaf curl disease**
P. DI BELLO (1), A. Diaz-Lara (2), R. Martin (3), (1) Oregon State University, Corvallis, OR, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) USDA-ARS Horticultural Crops Research Unit, Corvallis, OR, U.S.A.
- 468-P Current Status of Grapevine Virus Diseases in British Columbia**
S. POOJARI (1), J. Boulé (1), N. DeLury (1), T. Lowery (1), M. Rott (2), A. Schmidt (2), J. Úrbez Torres (1), (1) Summerland Research and Development Centre, Summerland, BC, Canada; (2) Canadian Food Inspection Agency, BC, Canada
- 469-P The prevalence of grapevine leafroll and red blotch diseases in Washington vineyards**
J. ADIPUTRA (1), P. Swamy (1), B. Donda (1), B. Bagewadi (1), N. Natra (1), R. Naidu (1), (1) Washington State University, prosser, WA, U.S.A.
- 470-P Association of *Grapevine rupestris stem pitting-associated virus* and *Grapevine Pinot gris virus* in declining grapevines on Schwarzspann rootstock.**
H. MCCOWN (1), S. Bag (1), M. Eng (1), M. Sudarshana (2), (1) University of California, Davis, CA, U.S.A.; (2) USDA-ARS, Davis, CA, U.S.A.
- 471-P Survey of *Arabis Mosaic* and *Grape Leaf Roll Associated virus* in Maryland vineyards.**
R. POKHAREL (1), (1) Maryland Dept of Agriculture, U.S.A.
- 472-P WITHDRAWN**
- 473-P Necrotic Streaking of Asiatic Lilies caused by *Plantago asiatica mosaic virus* in Chile**
X. BESOAIN (1), A. Vidal Takasaki (2), R. Camps (2), (1) Pontificia Universidad Católica de Valparaíso, Quillota, Chile; (2) Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

- 474-P Trichosanthes latent virus (TrLV), a novel potyvirus from *Trichosanthes cucumeroides* in Japan**
O. KIM (1), K. Kobayashi (2), K. Natsuaki (2), H. Shinohara (2), H. Negishi (2), (1) Tokyo University of Agriculture (TUA), 1737 Funako, Atsugi, Kanagawa 243-0034, Japan; (2) Tokyo University of Agriculture (TUA), Japan
- 475-P Identification and characterization of Zucchini tigre mosaic virus on creeping cucumber in Japan**
K. KOBAYASHI (1), H. Shinohara (2), H. Negishi (2), O. Kim (2), (1) Tokyo University of Agriculture (TUA), 1737 Funako, Atsugi, Kanagawa 243-0034, Japan; (2) Tokyo University of Agriculture (TUA), Japan
- 476-P Complete nucleotide sequences of a new bipartite begomovirus from *Malvastrum* sp. plants with bright yellow mosaic symptoms in South Texas**
O. ALABI (1), C. Villegas (2), L. Gregg (3), (1) Dept. of Plant Pathology & Microbiology, Texas A&M University AgriLife Research & Extension Center, Weslaco, TX, U.S.A.; (2) South Texas College, Weslaco, TX, U.S.A.; (3) Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.
- 477-P Infectivity analysis of strain L of chickpea chlorotic dwarf virus, a cotton mastrevirus, in *Nicotiana benthamiana* plants**
A. BERGAMIN FILHO (1), A. Bergamin Filho (1), (1) University of Sao Paulo, Piracicaba, Brazil
- 478-P Nucleotide sequence and genome organization of a novel *Panicovirus* from Bermuda grass**
M. TAHIR (1), B. Lockhart (2), S. Grinstead (1), D. Molloy (1), (1) USDA-ARS, Beltsville, MD, U.S.A.; (2) University of Minnesota, Department of Plant Pathology, St. Paul, MN, U.S.A.
- 479-P Identification of virus species infecting pepper in Guangdong province of China**
Y. Tang (1), Z. He (1), (1) Plant Protection Research Institute, Guangdong Academy of Agricultural Sciences, China
- 480-P Beet curly top virus strains associated with sugar beet in Idaho, Oregon, and a survey collection**
C. STRAUSBAUGH (1), I. Eujayl (1), B. Wintermantel (2), (1) USDA-ARS, Kimberly, ID, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.
- 481-P Virus diseases: a major threat to high value vegetable crops in Bangladesh and Nepal**
A. FAYAD (1), A. Fayad (1), R. Naidu (2), (1) Virginia Polytechnic Institute and State University, Blacksburg, VA, U.S.A.; (2) Washington State University, Prosser, WA, U.S.A.
- 482-P Tomato yellow mottle virus (ToYMoV): characterization of a newly emergent begomovirus associated with tomato disease in Costa Rica.**
M. MALIANO (1), M. Rojas (1), T. Melgarejo (2), M. Macedo (3), N. Barboza (4), A. Inoue Nagata (3), R. Gilbertson (5), (1) UC Davis, Davis, CA, U.S.A.; (2) Universidad Nacional Agraria La Molina, Peru; (3) University of Brasilia, Brazil; (4) Universidad de Costa Rica, Costa Rica; (5) UC Davis, CA, U.S.A.
- 483-P Validation of a novel gene target for detection and quantification of *Clavibacter michiganensis* subsp. *nebraskensis*, the causal agent of Goss's wilt**
R. MCNALLY (1), C. Ishimaru (2), D. Malvick (2), (1) University of Minnesota, St. Paul, MN, U.S.A.; (2) University of Minnesota, U.S.A.
- 484-P In-field detection of the select agent *Rathayibacter toxicus* using loop-mediated isothermal amplification**
M. ARIF (1), G. Busot (2), R. Mann (3), B. Rodoni (4), J. Stack (5), (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (3) Department of Economic Development, Jobs, Transport and Resources, Latrobe University, Bundoora, Australia; (4) Department of Economic Development, Jobs, Transport and Resources, Latrobe University, Australia; (5) Department of Plant Pathology, Kansas State University, Australia
- 485-P Development of recombinase-polymerase amplification assay for the detection of Western X phytoplasma (*Candidatus Phytoplasma pruni*) in sweet cherry**
D. VILLAMOR (1), H. Ferguson (1), K. Eastwell (1), (1) Washington State University, Prosser, WA, U.S.A.
- 486-P Viability of *Candidatus Liberibacter asiaticus* in grapefruit leaves at different stages of maturity and Huanglongbing disease symptom development**
M. KUNTA (1), E. Louzada (1), P. Vedasharan (1), (1) Texas A&M University-Kingsville Citrus Center, Weslaco, TX, U.S.A.
- 487-P Development of a multiplex real-time PCR for the improved detection of citrus canker-causing *Xanthomonas***
J. HANNA (1), M. Warwell (2), (1) USDA Forest Service - RMRS, Moscow, ID, U.S.A.; (2) USDA Forest Service, RMRS, U.S.A.
- 488-P Development of a rapid and reliable isothermal AmplifyRP diagnostic assay for specific detection of *Xylella fastidiosa***
R. LI (1), P. Russell (2), N. Mcowen (2), B. Davenport (2), S. Zhang (2), (1) Agdia Inc., U.S.A.; (2) Agdia Inc, U.S.A.
- 489-P Recombinase polymerase-based diagnostics for in-field detection of *Pseudomonas syringae* pv. *actinidiae*.**
J. STACK (1), M. Arif (2), J. Rascoe (3), M. Nakhla (3), G. Busot (1), (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Kansas State University, Manhattan, KS, U.S.A.; (3) USDA APHIS PPQ CPHST, U.S.A.
- 490-P Evidence for seed transmission of *Xylella fastidiosa* in pecan (*Carya illinoensis*).**
K. CERVANTES (1), D. Ray (1), R. Stamler (2), J. French (1), J. Soneji (3), R. Heerema (4), L. Grauke (5), J. Randall (4), (1) New Mexico State University, Las Cruces, NM, U.S.A.; (2) New Mexico State University, U.S.A.; (3) NMSU, Las Cruces, NM, U.S.A.; (4) New Mexico State University, Las Cruces, NM, U.S.A.; (5) USDA-ARS Pecan Breeding, Somerville, TX, U.S.A.
- 491-P A computer program for fast and easy typing of *Ralstonia solanacearum* species complex strains into genospecies and sequevars 1&2**
M. STULBERG (1), Q. Huang (2), (1) FNPRU, USDA/ARS & ORISE, Beltsville, MD, U.S.A.; (2) FNPRU, USDA/ARS, Beltsville, MD, U.S.A.
- 492-P Real-time PCR detection and discrimination of the parsley pathogens *Pseudomonas syringae* pv. *apii* and *Pseudomonas syringae* pv. *coriandricola***
J. REINTKE (1), G. Hiddink (2), D. Sanchez Mendez (2), (1) Enza Zaden BV, Enkhuizen, Netherlands; (2) Enza Zaden BV, Enkhuizen, Netherlands
- 493-P PCR Assays for the Detection of *Xanthomonas euvesicatoria*, Causal Agent of Bacterial Spot on Pepper and Tomato Plants**
R. JEONG (1), S. Son (2), M. Kyeon (2), H. Lee (3), J. Cha (2), (1) Chungbuk National University, Korea; (2) Department of Plant Medicine, Chungbuk National University, Korea; (3) Animal and Plant Quarantine Agency, Korea
- 494-P Loop-mediated isothermal amplification for the detection of soft rot causing *Dickeya* spp.**
G. MARRERO (1), J. Yasuhara-Bell (2), M. Melzer (2), A. Alvarez (2), (1) University of Hawaii at Manoa, Honolulu, HI, U.S.A.; (2) University of Hawaii at Manoa, U.S.A.
- 495-P WITHDRAWN**
- 496-P Early detection of *Leifsonia xyli* subsp. *xyli*, the causal agent of ratoon stunting disease, in sugarcane seedlings.**
D. OLIVERA (1), A. Urashima (1), (1) Federal University of Sao Carlos, Brazil
- 497-P Development of a loop-mediated isothermal amplification assay for the detection of *Harpophora maydis***
N. GONZALEZ (1), G. Munkvold (1), (1) Iowa State University, Ames, IA, U.S.A.
- 498-P Using Color Spectrophotometry to Evaluate Disease Severity of *Macrophomina phaseolina* in Soybean**
J. JORDAN (1), A. Mengistu (2), H. Kelly (1), (1) University of Tennessee, Jackson, TN, U.S.A.; (2) USDA, Jackson, TN, U.S.A.
- 499-P WITHDRAWN**

- 500-P Detection of *Erysiphe necator* fungicide-resistant alleles in leaf and air samples using novel molecular diagnostic techniques**
J. YAMAGATA (1), B. Warneke (2), T. Neill (3), W. Mahaffee (4), L. Miles (5), A. Schilder (6), (1) CSU Monterey Bay, Seaside, CA, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) USDA ARS, Corvallis, RI, U.S.A.; (4) USDA ARS, Corvallis, CA, U.S.A.; (5) Hartnell College, Salinas, CA, U.S.A.; (6) Michigan State University, Department of Plant, Soil and Microbial Sciences, East Lansing, MI, U.S.A.
- 501-P Investigation of primary infection period of apple blotch and circular leaf spot based on loop-mediated isothermal amplification assay in Korea**
H. JUNG (1), S. Lee (2), S. Lee (2), J. Keum (2), S. Park (2), H. Woo (3), Y. Lim (4), I. Kang (2), (1) College of Agricultural and Life Sciences, Kyungpook National University, Daegu, South Korea; (2) College of Agricultural and Life Sciences, Kyungpook National University, South Korea; (3) Bayer Crop Science, South Korea; (4) Gyeongsangbuk-do Agricultural Research & Extension Services, South Korea
- 502-P A new paradigm for early diagnosis tool for major fungal disease in apple and persimmon**
S. LEE (1), M. Jeon (2), J. Kim (3), H. Jung (1), (1) College of Agricultural and Life Sciences, Kyungpook National University, Daegu, South Korea; (2) School of Electrical Engineering and Computer Science, Kyungpook National University, Daegu, South Korea; (3) School of Electrical Engineering and Computer Science, Kyungpook National University, South Korea
- 503-P Immunochemical detection of the Silverleaf disease of fruit trees caused by *Chondrostereum pupureum***
D. GRINBERGS (1), J. Chilian (1), A. France (1), (1) Instituto de Investigaciones Agropecuarias, Chillán, Chile
- 504-P Evaluation of molecular diagnostic methods for *Monilinia* species of regulatory concern**
S. HAYMES (1), K. Zeller (1), Z. Abad (1), L. Knight (1), (1) USDA APHIS PPQ S&T Center for Plant Science and Technology, Beltsville, MD, U.S.A.
- 505-P Identification of genomics-based detection assay for *Rhizoctonia solani* anastomosis groups**
T. MILES (1), J. Cerda (1), (1) CSU Monterey Bay, Seaside, CA, U.S.A.
- 506-P Development, testing and pending deployment of a LAMP diagnostic screening method for the Citrus Black Spot pathogen, *Guignardia citricarpa*.**
K. ZELLER (1), K. Levin (2), G. Wei (2), G. Abad (2), H. Gomez (3), T. Riley (3), Z. Liu (2), (1) USDA-APHIS-PPQ, CPHST, Beltsville, MD, U.S.A.; (2) USDA-APHIS-PPQ, CPHST, U.S.A.; (3) USDA-APHIS-PPQ, CHRFP, FL, U.S.A.
- 507-P Rapid diagnostic tools for soilborne pathogens of strawberry**
A. BURKHARDT (1), T. Miles (2), M. Ramon (1), S. Koike (3), F. Martin (1), (1) USDA, Salinas, CA, U.S.A.; (2) CSUMB, Monterey, CA, U.S.A.; (3) Cooperative Extension Monterey County, Salinas, CA, U.S.A.
- 508-P BioPCR: An improved method for detection of *Colletotrichum acutatum* in asymptomatic strawberry nursery plants**
P. SUDARSHANA (1), K. Mani (1), P. Randhawa (1), T. Walters (2), (1) California Seed and Plant Labs, Pleasant Grove, CA, U.S.A.; (2) Walters Ag Research, Anacortes, WA, U.S.A.
- 509-P Development of a quantitative PCR assay to quantify resistance to *Diaporthe helianthi* and *Diaporthe gulyae* in sunflower**
T. OLSON (1), F. Mathew (1), A. Adhikari (1), B. Kontz (1), L. Marek (2) (1) South Dakota State University, Brookings, SD, U.S.A.; (2) Iowa State University and USDA-ARS, Ames, IA, U.S.A.
- 510-P WITHDRAWN**
- 511-P Phylogenetic identification of pathogenic and endophytic fungal populations in west coast Douglas-fir foliage**
D. DANIELS (1), J. Kiser (1), (1) Oregon State University, Corvallis, OR, U.S.A.
- 512-P Isolation and Characterization of *Paenibacillus* spp. for Biological control of Ginseng root rot**
B. KARAKKAT (1), M. Franchett (1), P. Koch (1), (1) University of Wisconsin, Madison, WI, U.S.A.
- 513-P Rapid differentiation of *Claviceps* species occurring in Oregon and Washington using high resolution melting curve analysis**
N. KAUR (1), R. Cating (2), J. Dung (3), S. Alderman (4), D. Walenta (5), P. Hamm (1), K. Frost (1), (1) Oregon State University, Hermiston, OR, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) Oregon State University, Madras, OR, U.S.A.; (4) USDA-ARS National Forage Seed production Research Center, Corvallis, OR, U.S.A.; (5) Oregon State University, La Grande, OR, U.S.A.
- 514-p WITHDRAWN**
- 515-P Specific detection of the root-lesion nematode *Pratylenchus scribneri* using conventional and real-time PCR**
G. YAN (1), D. Huang (2), G. Yan (3), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (3) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.
- 516-P Real-time and conventional PCR assays for identifying the stubby root nematode *Paratrichodorus allius***
G. YAN (1), D. Huang (2), G. Yan (2), (1) North Dakota State University, Fargo, ND, U.S.A.; (2) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.
- 517-P Development of species-specific qPCR tests for detection and quantification of *Meloidogyne hapla***
A. GORNY (1), X. Wang (2), S. Pethybridge (1), (1) Cornell University, School of Integrative Plant Sciences, Plant Pathology & Plant-Microbe Biology Section, Geneva, NY, U.S.A.; (2) USDA-ARS, Plant Protection Research Unit, Cornell University, Ithaca, NY, U.S.A.
- 518-P DNA-nanosensor based diagnostics of plant pathogens**
A. BAETSEN-YOUNG (1), M. Vasher (1), E. Alolijla (1), B. Day (1), (1) Michigan State University, East Lansing, MI, U.S.A.
- 519-P Optimization of a fluorescence *in situ* hybridization assay for detection and visualization of *Plasmopara obducens* from plants and soil**
C. SALGADO-SALAZAR (1), (1) USDA-ARS, Rutgers University, Beltsville, MD, U.S.A.
- 520-P Developing an innovative molecular toolbox for identification of *Phytophthora* species with emphasis on species of regulatory concern.**
Z. ABAD (1), J. Bienapfl (1), L. Knight (1), K. Jennings (1), M. Galvez (1), L. Schena (2), (1) USDA APHIS PPQ S&T, U.S.A.; (2) Mediterranean University of Reggio Calabria, Italy
- 521-P Evaluation of Recombinase Polymerase Amplification (RPA) Isothermal Amplification Diagnostic Assay for *Phytophthora ramorum*.**
J. BIENAPFL (1), L. Knight (1), Z. Abad (1), (1) USDA APHIS PPQ S&T, U.S.A.
- 522-P Extracting DNA for qPCR amplification from plant tissue in ELISA buffer**
N. OSTERBAUER (1), S. Navarro (2), (1) Oregon Dept. of Agriculture, Salem, OR, U.S.A.; (2) Oregon Dept. of Forestry, Salem, OR, U.S.A.
- 523-P Utilizing mitochondrial loci to develop TaqMan and recombinase polymerase amplification assays for the genus *Pythium***
T. MILES (1), A. Burkhardt (2), F. Martin (2), (1) California State University Monterey Bay, U.S.A.; (2) USDA-ARS, U.S.A.
- 524-P Development of molecular diagnostic tools for the invasive oomycete pathogen *Phytophthora tentaculata***
N. Luecke (1), S. Koenig (1), T. Miles (2), (1) CSU Monterey Bay, Seaside, CA, U.S.A.; (2) California State University Monterey Bay, U.S.A.
- 525-P A CANARY Assay for *Phytophthora* spp.**
Z. LIU (1), D. Kalkofen (1), A. Flannery (1), G. Wei (2), F. Nargi (3), Z. Liu (2), G. Abad (2), J. Bienapfl (2), M. Nakhla (2), (1) PathSensors, Inc., Baltimore, MD, U.S.A.; (2) USDA-APHIS-PPQ-S&T-Center for Plant Health Science and Technology (CPHST), U.S.A.; (3) Bioengineering Systems & Technologies, MIT Lincoln Laboratory (MIT-LL), U.S.A.
- 526-P WITHDRAWN**

- 527-P Early detection and quantification of *Pseudoperonospora cubensis* airborne sporangia using real-time PCR**
A. RAHMAN (1), L. Quesada-Ocampo (1), (1) NCSU, Raleigh, NC, U.S.A.
- 528-P On-site detection of *Pythium ultimum* in potatoes using loop-mediated isothermal amplification (LAMP)**
J. WOODHALL (1), P. Wharton (2), S. Dangi (2), K. Perkins (3), J. Azcona (3), (1) University of Idaho, Parma, ID, U.S.A.; (2) University of Idaho, Aberdeen, ID, U.S.A.; (3) Fera Science Ltd, Sand Hutton, United Kingdom
- 529-P Sensitive detection and discrimination of HPWMoV, WSMV and TriMV using multiplex RT-PCR and High Resolution Melting: Part II**
A. LARREA-SARMIENTO (1), M. Arif (2), F. Ochoa-Corona (3), A. Olmedo-Velarde (4), J. Olson (3), (1) Universidad de las Américas, Quito, OK, Ecuador; (2) Kansas State University, Manhattan, KS, U.S.A.; (3) Oklahoma State University, Stillwater, OK, U.S.A.; (4) Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador
- 530-P Detection of *Apple scar skin viroid* in apple fruits by reverse transcription loop-mediated isothermal amplification (RT-LAMP)**
S. KWON (1), I. Cho (2), S. Choi (1), J. Yoon (1), G. Choi (1), (1) National Institute of Horticultural and Herbal Science, South Korea; (2) National Institute of Horticultural and Herbal Science, South Korea
- 531-P Three genomic regions of *Cilevirus* allows detection and discrimination of two related species infecting citrus.**
W. TURIZO (1), O. Oliveros (1), F. Ochoa-Corona (2), (1) Universidad Nacional de Colombia, Bogota, Colombia; (2) Oklahoma State University, Stillwater, OK, U.S.A.
- 532-P WITHDRAWN**
- 533-P Development of conventional and Real-time RT-PCR assays for *Strawberry necrotic shock virus***
T. THEKKE VEETIL (1), T. Ho (2), V. Whitaker (3), I. Tzanetakis (2), (1) University of Arkansas, U.S.A.; (2) University of Arkansas, U.S.A.; (3) University of Florida, U.S.A.
- 534-P Rose rosette virus detection using loop-mediated isothermal amplification (LAMP)**
A. SALAZAR AGUIRRE (1), S. Molina Cárdenas (1), F. Ochoa-Corona (2), J. Olson (2), (1) Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador; (2) Oklahoma State University, Stillwater, OK, U.S.A.
- 535-P Development of a field-based detection technique for *Rose rosette virus* using isothermal reverse transcription-recombinase polymerase amplification**
B. BABU (1), B. Washburn (2), S. Miller (2), F. Ochoa-Corona (3), G. Knox (1), (1) North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.; (2) Department of Biological Science, Florida State University, Tallahassee, FL, U.S.A.; (3) Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK, U.S.A.
- 536-P Development and characterization of polyclonal and monoclonal antibodies to Rose rosette virus.**
R. JORDAN (1), M. Guaragna (1), J. Hammond (1), (1) US National Arboretum, USDA-ARS, Beltsville, MD, U.S.A.
- 537-P Validation of RT-PCR High Resolution Melting as a detection method of Tombusvirus**
F. Ochoa-Corona (1), Y. Carillo Tarzona (1) (1) Oklahoma State University, U.S.A.
- 538-P Virus detection of *Tobamovirus* with wide spectrum degenerate oligonucleotides by TD RT-PCR High Resolution Melting**
J. GARCIA SUAREZ (1), S. Dohbal (1), F. Ochoa-Corona (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.
- 539-P Discriminating *Potexvirus* species by RT-PCR coupled to High Resolution Melting**
A. OLMEDO-VELARDE (1), F. Ochoa-Corona (2), (1) Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador; (2) Oklahoma State University, Stillwater, OK, U.S.A.
- 540-P A preemptive detection system to screen water for the presence of plant viruses**
J. DANIEL (1), B. Gallucci Mazziero (1), B. Dunn (1), F. Ochoa-Corona (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.
- 541-P Multiplex RT-PCR detection of eight viruses infecting cucurbits and discrimination using High Resolution Melting analysis**
L. PEÑA ZUNIGA (1), F. Ochoa-Corona (1), A. Ali (2), (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) University of Tulsa, Tulsa, OK, U.S.A.
- 542-P Toward broad detection of emaraviruses: Endpoint RT-PCR**
A. OLMEDO-VELARDE (1), F. Ochoa-Corona (2), T. Elbeaino (3), (1) Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador; (2) Oklahoma State University, Stillwater, OK, U.S.A.; (3) Istituto Agronomico Mediterraneo di Bari, Valenzano, Italy
- 543-P Waterborne plant virus sampling and detection in aqueous environment.**
B. GALLUCCI MAZZIERO (1), (1) Oklahoma State University, Stillwater, OK, U.S.A.
- 544-P Occurrence of endornaviruses in non-cultivated plant species**
R. HERSCHLAG (1), E. Rodrigues de Souto (2), R. Valverde (1), (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.; (2) Universidade Estadual de Maringá, Maringá, LA, Brazil
- 545-P Development and validation of a quadruplex real-time RT-PCR assay for simultaneous detection of three *Citrus leprosis viruses* in plants**
G. WEI (1), A. Roy (2), W. Schneider (3), R. Brlansky (2), M. Nakhla (1), (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, U.S.A.; (2) University of Florida, IFAS, Plant Pathology Department, Citrus Research and Education Center, Lake Alfred, FL, U.S.A.; (3) USDA-ARS-FDWSRU, Frederick, MD, U.S.A.
- 546-P A sociological assessment of *Potato virus Y* in western Washington: Barriers and bridges to adopting new management practices**
A. BEISSINGER (1), C. Benedict (2), J. Goldberger (3), D. Inglis (1), (1) Washington State University Northwestern Washington Research and Extension Center, Mount Vernon, WA, U.S.A.; (2) Washington State University Whatcom County Extension, Bellingham, WA, U.S.A.; (3) Washington State University, Pullman, WA, U.S.A.
- 547-P Rapid and sensitive detection of tomato chlorotic dwarf viroid in crude plant extracts using isothermal RT-recombinase polymerase amplification**
N. WANG (1), M. Dewdney (2), (1) Department of Plant Pathology, Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.; (2) mmdewdney@ufl.edu, Lake Alfred, FL, U.S.A.
- 548-P Distribution and vertical transmission of Southern tomato virus in tomato**
S. COSKAN (1), R. Alcalá-Briseno (1), J. Polston (1), (1) UNIVERSITY OF FLORIDA, GAINESVILLE, FL, U.S.A.

New and Emerging Diseases

- 549-P Emergence of a novel white stripe disease pathogen *Stenotrophomonas maltophilia* strain Sia5 in rice fields of Punjab under the climate change scenario**
K. RIAZ (1), K. Riaz (2), A. Dilferoze (3), M. Alam (3), A. Riaz (4), S. Jameel (5), S. Khan (6), A. Hannan (7), (1) Department of Plant Pathology, University of Agriculture Faisalabad, Faisalabad, Other, Pakistan; (2) University of Agriculture Faisalabad, Faisalabad, Other, Pakistan; (3) University of Agriculture, Faisalabad, Other, Pakistan; (4) Plant Protection Division NIAB, Faisalabad, Pakistan, Faisalabad, Other, Pakistan; (5) Department of Plant Pathology, University of Agriculture, Faisalabad-38040, Pakistan, Faisalabad, Pakistan; (6) Centre of Agricultural Biochemistry and Biotechnology, University of Agriculture, Faisalabad-38040, Pakistan, Faisalabad, Pakistan; (7) Department of Botany, Ghazi University, Dera Ghazi Khan, Dera Ghazi Khan, Other, Pakistan
- 550-P An invasive lethal phytoplasma disease threatening stone fruit production: detection, epidemiology and management.**
- 551-P Root and shoot susceptibility of peach/almond rootstock to pistachio bushy top syndrome isolates of *Rhodococcus* spp.**
E. FICHNER (1), S. Dhaouadi (2), (1) University of California Division of Agriculture and Natural Resources, Tulare, CA, U.S.A.; (2) University of California Division of Agriculture and Natural Resources, Tulare, CA, U.S.A.

- 552-P Xylella fastidiosa isolates differ in the ability to undergo genetic recombination**
P. KANDEL (1), R. Almeida (2), L. De La Fuente (1), (1) Department of Entomology and Plant Pathology, Auburn University, Auburn, AL, U.S.A.; (2) Department of Environmental Science, Policy and Management, UC Berkeley, Berkeley, CA, U.S.A.
- 553-P Soil survival potential of pistachio bushy top syndrome isolates of *Rhodococcus* spp.**
E. FICHTNER (1), S. Dhaouadi (1), E. Molina (2), R. Stamler (2), J. Randall (2), (1) University of California Division of Agriculture and Natural Resources, Tulare, CA, U.S.A.; (2) New Mexico State University, Las Cruces, NM, U.S.A.
- 554-P Bacterial black spot of mango, *Mangifera indica*, caused by *Xanthomonas citri* pv *mangiferaeindicae*, is confirmed in the Western Hemisphere**
G. SANAHUJA (1), R. Ploetz (1), P. Lopez (1), J. Konkol (1), A. Palamateer (1), (1) University of Florida, Homestead, FL, U.S.A.
- 555-P Survey on pathogenic *Xanthomonas* recovered from different lettuce cultivars in Canada.**
V. TOUSSAINT (1), D. Xu (1), P. Hébert (1), M. Cadioux (1), M. Ciotola (1), H. Van der Heyden (2), D. Rekika (3), S. Jenni (1), (1) Agriculture and Agri-Food Canada, St-Jean-sur-Richelieu, QC, Canada; (2) Compagnie de recherche Phytodata, Sherrington, QC, Canada; (3) Fondation pour l'amélioration génétique de la laitue et des légumes feuilles, Napierville, QC, Canada
- 556-P WITHDRAWN**
- 557-P WITHDRAWN**
- 558-P Wheat blast is caused by multiple *Pyricularia* species, including *Pyricularia graminis-tritici* sp. nov.**
V. CASTROAGUDIN (1), S. Moreira (2), D. Pereira (3), S. Moreira (4), P. Brunner (3), J. Maciel (5), P. Crous (6), B. McDonald (3), E. Alves (7), P. Ceresini (4), (1) University of Sao Paulo State, Ilha Solteira, Other, Brazil; (2) Federal University of Lavras, Lavras, Brazil; (3) Institute of Integrative Biology, ETH Zurich, Zurich, Switzerland; (4) University of Sao Paulo State, Ilha Solteira, Brazil; (5) Brazilian Agriculture Research Corporation-Wheat (EMBRAPA-Trigo), Passo Fundo, Brazil; (6) CBS-KNAW Fungal Biodiversity Centre, Utrecht, Netherlands; (7) Federal University of Lavras, Lavras, Brazil
- 559-P Unraveling Silverleaf disease: Reversion of foliar symptoms and plants recovery**
D. GRINBERGS (1), A. France (1), J. Chilian (1), (1) Instituto de Investigaciones Agropecuarias, Chillán, Chile
- 560-P Fungi in the wood: The fungi associated with the ambrosia beetle, *Xylosandrus germanus* and its galleries in *Malus domestica***
S. VILLANI (1), K. Ayer (2), D. Breth (3), K. Cox (2), (1) North Carolina State University, Mills River, NC, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.; (3) Cornell Cooperative Extension, Albion, NY, U.S.A.
- 561-P High diversity in the population of an emerging blackberry pathogen, *Fusarium oxysporum*.**
A. PASTRANA (1), S. Kirkpatrick (1), T. Gordon (1), (1) University of California, Davis, Davis, CA, U.S.A.
- 562-P Mucor Rot – An Emerging Postharvest Disease of Mandarin Fruit Caused by *Mucor piriformis* and other *Mucor* spp. in California.**
S. SAITO (1), T. Michailides (2), C. Xiao (1), (1) USDA-ARS, San Joaquin Valley Agricultural Sciences Center, Parlier, CA, U.S.A.; (2) Kearney Agricultural Research & Extension Center, UC-Davis, Division of Agriculture and Natural Resources, Parlier, CA, U.S.A.
- 563-P Botrytis californica, a new *Botrytis* species causing gray mold in blueberries and table grapes in California.**
S. SAITO (1), D. Margosan (2), T. Michailides (3), C. Xiao (1), (1) USDA-ARS, San Joaquin Valley Agricultural Sciences Center, Parlier, CA, U.S.A.; (2) USDA-Agricultural Research Service, San Joaquin Valley Agricultural Sciences Center, Parlier, CA, U.S.A.; (3) Kearney Agricultural Research & Extension Center, Parlier, CA, U.S.A.
- 564-P Multiple *Pestalotiopsis* and *Neopestalotiopsis* species cause flower blight of macadamia in Australia**
D. FERNANDO (1), C. Amarasinghe (1), S. Simsek (2), (1) University of Manitoba, Winnipeg, MB, Canada; (2) North Dakota State University, Fargo, ND, U.S.A.
- 565-P Cytospora leucostoma is the most virulent and prevalent causal agent of Cytospora Canker on peaches on the Western Slope of Colorado**
J. Stewart (1), K. Otto (1), I. Minas (2), S. Miller (1), (1) Bioagricultural Sciences and Pest Management, Colorado State University, Fort Collins, CO, U.S.A.; (2) Department of Horticulture and Landscape Architecture; Western Colorado Research Center Colorado State University, Grand Junction, CO, U.S.A.
- 566-P New *Botrytis* species affecting strawberry on the east coast**
G. SCHNABEL (1), M. Dowling (1), M. Hu (1), (1) Clemson University, U.S.A.
- 567-P Laurel wilt, caused by *Raffaelea lauricola*, is detected for the first time outside the southeastern USA**
R. PLOETZ (1), Y. Thant (2), M. Hughes (3), T. Dreaden (4), J. Konkol (1), A. Kyaw (2), J. Smith (3), C. Harmon (3), (1) University of Florida, Homestead, FL, U.S.A.; (2) Winrock International, Farmer-to-Farmer Program, Yangon, Myanmar, Yangon, Burma; (3) University of Florida, Gainesville, FL, U.S.A.; (4) U.S. Forest Service, Lexington, KY, U.S.A.
- 568-P WITHDRAWN**
- 569-P Powdery mildews on native plants in Utah**
E. LAURITZEN (1), (1) Utah State University, U.S.A.
- 570-P Diaporthe and spruce decline: incidence, pathogenicity, and population genetics**
C. MCTAVISH (1), D. Fulbright (2), A. Jarosz (1), (1) Michigan State University, East Lansing, U.S.A.; (2) Michigan State University, U.S.A.; (3) Michigan State University, East Lansing, MI, U.S.A.
- 571-P New canker disease of Incense-cedar in Oregon caused by *Phaeobotryon cupressi***
J. WEILAND (1), R. Sniezko (2), M. Wiseman (3), M. Serdani (3), M. Putnam (3), (1) USDA-ARS, Horticultural Crops Research Laboratory, Corvallis, OR, U.S.A.; (2) USDA Forest Service, Dorena Genetic Resource Center, Cottage Grove, OR, U.S.A.; (3) Oregon State University, Botany and Plant Pathology Department, Corvallis, OR, U.S.A.
- 572-P First report of *Watermelon chlorotic stunt virus* in rain-fed farms in Usfan, Saudi Arabia**
S. BEST (1), S. Fraedrich (1), (1) USDA Forest Service, Athens, GA, U.S.A.
- 573-P The laurel wilt story: introduction and impact of an exotic vector (*Xyleborus glabratus*) and pathogen (*Raffaelea lauricola*)**
M. HUGHES (1), J. Riggins (2), A. cognato (3), F. Koch (4), C. Anderson (5), T. Dreaden (6), J. Formby (2), R. Ploetz (7), J. Smith (8), (1) University of Florida, School of Forest Resources and Conservation, Gainesville, FL, U.S.A.; (2) Mississippi State University, Department of Biochemistry, Molecular Biology, Entomology, and Plant Pathology, U.S.A.; (3) Michigan State University, Department of Entomology, MI, U.S.A.; (4) U.S. Forest Service, Southern Research Station, Eastern Forest Environmental Threat Assessment Center, NC, U.S.A.; (5) Research School of Biology, Australian National University, Australia; (6) U.S. Forest Service, Southern Research Station, U.S.A.; (7) University of Florida, Department of Plant Pathology, FL, U.S.A.; (8) University of Florida, School of Forest Resources and Conservation, U.S.A.
- 574-P Susceptibility of eight untested species of Cucurbitaceae to gummy stem blight under field conditions**
G. RENNBERGER (1), A. Keinath (1), (1) Coastal Research and Education Center, Clemson University, Charleston, SC, U.S.A.
- 575-P WITHDRAWN**
- 576-P *Raffaelea arxii* may be the primary symbiont of *Xyleborus affinis***
J. SAUCEDO (1), R. Ploetz (2), D. Carrillo (2), J. Konkol (2), J. Smith (1), J. Rollins (1), S. Ochoa (3), (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, Homestead, FL, U.S.A.; (3) Universidad Michoacana de San Nicolás de Hidalgo, Uruapan, Mexico
- 577-P Web blight of spinach in the desert southwest caused by *Pythium aphanidermatum***
M. BECKTELL (1), (1) Colorado Mesa University, Grand Junction, CO, U.S.A.

- 578-P Stone fruit survey efforts in Texas monitoring for Plum Pox Virus, European Stone Fruit Yellows & Light Brown Apple Moth: 2015-2016.**
K. ONG (1), S. Rhodes (1), (1) Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.
- 579-P Red rust of bromeliads caused by a parasitic alga in Florida**
G. SANAHUJA (1), P. Lopez (1), A. Palmateer (1), (1) University of Florida, Homestead, FL, U.S.A.
- 580-P WITHDRAWN**
- 581-P First detection of the stubby root nematode *Paratrichodorus allius* on potato in North Dakota and on sugarbeet in Minnesota**
G. YAN (1), A. Plaisance (2), D. Huang (1), Z. Handoo (3), (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (2) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (3) USDA-ARS, Nematology Laboratory, Beltsville, MD, U.S.A.
- 582-P Phytophthora nicotianae causing foliar blight of *Codiaeum variegatum* and *Zamioculcas zamiifolia* in Florida**
G. SANAHUJA (1), P. Lopez (1), A. Palmateer (1), (1) University of Florida, Homestead, FL, U.S.A.
- 583-P WITHDRAWN**
- 584-P Characterization of viral particles formed by *Grapevine vein clearing virus* (GVCV)**
Y. ZHANG (1), M. Adhab (1), J. Scholz (1), (1) University of Missouri, U.S.A.
- 585-P Survey for viruses of grapevine (*Vitis vinifera* L.) in coastal vineyards of Croatia**
D. VONCINA (1), M. Al Rwahnih (2), A. Rowhani (2), R. Almeida (3), (1) Department of Plant Pathology, University of Zagreb Faculty of Agriculture, Zagreb, Croatia; (2) Department of Plant Pathology, University of California, Davis, Davis, CA, U.S.A.; (3) Department of Environmental Science, Policy and Management, University of California, Berkeley, Berkeley, CA, U.S.A.
- 586-P Phylogeny of geminivirus coat protein sequences and dPCR aid in identifying *Spissistilus festinus* as a vector of grapevine red blotch-associated virus**
B. Bahder (1), M. Sudarshana (2), F. Zalom (1), M. Jayanth (1) (1) University of California, U.S.A.; (2) USDA-ARS, U.S.A.
- 587-P Blueberry green mosaic symptoms are associated with the presence of a new vitivirus**
T. THEKKE-VEETIL (1), T. Ho (1), J. Polashock (2), I. Tzanetakis (1), (1) University of Arkansas, U.S.A.; (2) USDA-ARS, U.S.A.
- 588-P Genome sequence analysis of a legume-infecting *Toma-to chlorotic spot virus* isolate**
R. ADEGBOLA (1), R. Kemerait (2), S. Adkins (3), R. Naidu (1), (1) Washington State University, Prosser, WA, U.S.A.; (2) Department of Plant Pathology, The University of Georgia, Tifton, GA, U.S.A.; (3) USDA ARS USHRL, Fort Pierce, FL, U.S.A.
- 589-P Viral metagenomics of *Caladium x hortulanum* (Araceae) in Florida**
R. ALCALA BRISEÑO (1), M. Londoño (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 590-P WITHDRAWN**
- 591-P Sequence variation between isolates of *Plantago asiatica mosaic virus* from lily and other hosts**
R. HAMMOND (1), S. Zhang (2), (1) USDA ARS, Beltsville, MD, U.S.A.; (2) Agdia, Inc., Elkhart, IN, U.S.A.
- 592-P Detection and characterization of a novel potyvirus, *Crinum mosaic virus*, in ornamental *Crinum*.**
R. JORDAN (1), A. Khawaja (1), M. Guaragna (1), (1) US National Arboretum, USDA-ARS, Beltsville, MD, U.S.A.
- 593-P Viruses of brugmansia in Mississippi**
N. ABOUGHANEM-SABANADZOVIC (1), A. Lawrence (1), S. Sabanadzovic (1), (1) Mississippi State University, U.S.A.
- 594-P Molecular Detection of Ti ringspot associated virus, a novel emaravirus associated with ti ringspot disease of *Cordylone fruticosa* (L.) in Hawai'i**
M. MELZER (1), A. Park (1), (1) University of Hawaii, U.S.A.
- 595-P Is there resistance to Rose Rosette Disease among cultivated roses?**
K. ONG (1), J. Olson (2), T. Evans (3), M. Windham (4), E. Roundey (5), J. Lau (5), D. Byrne (5), (1) Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.; (2) Oklahoma State University, Stillwater, OK, U.S.A.; (3) Department of Plant and Soil Sciences, University of Delaware, Newark, DE, U.S.A.; (4) Entomology and Plant Pathology Department, University of Tennessee, Knoxville, TN, U.S.A.; (5) Department of Horticultural Sciences, Texas A&M University, College Station, TX, U.S.A.
- 596-P Survey for Grapevine Pinot gris virus infecting Grapevine in the Foundation Plant Services Vineyards at the University of California, Davis**
M. AL RWAHNIH (1), N. Westrick (2), D. Golino (2), A. Rowhani (2), (1) University of California, Davis, Davis, CA, U.S.A.; (2) University of California, Davis, U.S.A.
- 597-P WITHDRAWN**
- 598-P First report and characterization of *Taro bacilliform virus* in the USA**
M. MELZER (1), K. Dey (1), A. Chan Borges (1), M. Long (1), W. Borth (1), N. Wichitmithed (1), J. Hu (1), R. Li (2), (1) University of Hawaii, U.S.A.; (2) USDA-ARS, U.S.A.
- 599-P Association of a mixed infection of *Lettuce chlorosis virus*, *Papaya ringspot virus*, and *Tomato yellow leaf curl virus-IL* in a Texas papaya orchard**
O. ALABI (1), M. Al Rwahnih (2), J. Brown (3), J. Jifon (4), J. Park (5), L. Gregg (6), M. Sétamou (7), A. Idris (3), (1) Dept. of Plant Pathology & Microbiology, Texas A&M University AgriLife Research & Extension Center, Weslaco, TX, U.S.A.; (2) Department of Plant Pathology, University of California, Davis, Davis, CA, U.S.A.; (3) School of Plant Sciences, University of Arizona, Tucson, AZ, U.S.A.; (4) Department of Horticultural Sciences, Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.; (5) Texas A&M University, Kingsville Citrus Center, Weslaco, TX, U.S.A.; (6) Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.; (7) Department of Agriculture, Agribusiness, and Environmental Sciences, Texas A&M University, Kingsville Citrus Center, Weslaco, TX, U.S.A.
- 600-P Seed-borne virome in cucurbits**
S. SABANADZOVIC (1), N. Aboughanem-Sabanadzovic (1), (1) Mississippi State University, U.S.A.
- 601-P Reemergence of the torradovirus, *Tomato necrotic dwarf virus*, in processing tomatoes in the Central Valley of California**
O. BATUMAN (1), M. Vasquez-Mayorga (1), J. Nunez (2), L. Hladky (3), W. Wintermantel (3), R. Gilbertson (1), (1) University of California Davis, Davis, CA, U.S.A.; (2) University of California Cooperative Extension, Bakersfield, CA, U.S.A.; (3) United States Department of Agriculture, Salinas, CA, U.S.A.

Analytical and Theoretical Plant Pathology

- 602-P Discussion on calculation of disease severity index values from scales with unequal intervals.**
K. CHIANG (1), H. Liu (1), C. Bock (2), (1) Division of Biometrics, Department of Agronomy, National Chung Hsing University, Taiwan; (2) USDA-ARS-SEFTNRL, U.S.A.
- 603-P Predicting Robust Candidates for a Boxwood Blight Immunoassay: An Automated Computational Workflow with Broad Applications for Phytopathology**
D. VELTRI (1), D. Luster (2), M. McMahon (2), J. Crouch (1), (1) USDA-ARS, Beltsville, MD, U.S.A.; (2) USDA-ARS, Frederick, MD, U.S.A.
- 604-P Identification of conducive temperatures for decision support modeling of sugarcane rusts in Florida**
B. CHAULAGAIN (1), M. Hincapie (1), S. Sanjel (1), C. Fraisse (2), R. Raid (1), P. Rott (1), (1) University of Florida, Belle Glade, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.
- 605-P WITHDRAWN**

606-P Comparing epidemics of unique *Phytophthora infestans* clonal lineages with biometrically enhanced spatio-temporal modeling tools

K. MOREY GOLD (1), Z. Zhang (2), D. Rouse (1), A. Gevens (1), (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) University of Wisconsin-Madison, U.S.A.

Climate Change

607-P Impacts of climate change on wheat powdery mildew epidemics in China

Y. ZHOU (1), X. Tang (1), (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, China

608-P Quantifying the potential effects of regional climate change on wheat leaf rust disease in the Grand-Duchy of Luxembourg.

M. EL JARROUDI (1), L. Kouadio (2), J. Junk (3), B. Tychon (1), P. Delfosse (3), (1) University of Liege, Belgium; (2) University of Southern Queensland, Australia; (3) Luxembourg Institute of Science & Technology, Luxembourg

609-P Screening some rust universal-susceptible wheat varieties for ozone tolerance and some applications.

A. MASHAHEET (1), D. Marshall (2), K. Burkey (2), A. Abdelrhim (1), F. Ullah (1), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) USDA-ARS, North Carolina State University, Raleigh, NC, U.S.A.

610-P Distribution models of common bean dry root rot in Brazil: current and predicted disease distribution in climate change scenarios

R. MACEDO (1), L. Abud (1), F. Yoshida (1), L. Sales (1), E. Barbosa (2), M. Lobo (2), R. Macedo (1), (1) Universidade Federal de Goiás, Goiânia, Brazil; (2) Brazilian Corporation for Agricultural Research (Embrapa), Goiânia, Brazil

611-P Discovery of biological drivers of pitch canker disease in a changing climate

T. QUESADA (1), T. Quesada (1), C. Staub (1), M. Marsik (1), K. Shin (1), K. Smith (2), J. Hughes (1), (1) University of Florida, Gainesville, FL, U.S.A.; (2) US Forest Service / University of Florida, Gainesville, FL, U.S.A.

612-P Potential species distributions of *Armillaria solidipes* and *Pseudotsuga menziesii* under contemporary and changing climates in the interior western USA

J. HANNA (1), M. Warwell (2), H. Maffei (3), M. Fairweather (4), J. Blodgett (5), P. Zambino (6), J. Worrall (7), K. Burns (8), J. Jacobs (9), S. Ashiglar (2), J. Lundquist (10), M. Kim (11), A. Ross-Davis (2), C. Hoffman (12), R. Mathiasen (12), R. Hofstetter (12), J. Shaw (13), E. Pitman (2), E. Nelson (12), G. McDonald (2), M. Cleary (14), S. Brar (15), B. Richardson (16), N. Klopfenstein (2), (1) USDA Forest Service - RMRS, Moscow, ID, U.S.A.; (10) USDA Forest Service, FHP Region 10/PNWRS, Anchorage, AK, U.S.A.; (11) Department of Forestry, Environment and Systems, Kookmin University, Seoul, South Korea; (12) School of Forestry, Northern Arizona University, Flagstaff, AZ, U.S.A.; (13) USDA Forest Service, Interior West Forest Inventory and Analysis, Ogden, UT, U.S.A.; (14) Swedish University of Agricultural Sciences, Uppsala, Sweden; (15) SCION/Massey University, New Zealand; (16) USDA Forest Service, RMRS, Provo, UT, U.S.A.; (2) USDA Forest Service, RMRS, Moscow, ID, U.S.A.; (3) USDA Forest Service, FHP Region 6, Bend, OR, U.S.A.; (4) USDA Forest Service, Region 5 Regional Office, Vallejo, CA, U.S.A.; (5) USDA Forest Service, FHP Region 2, Rapid City, SD, U.S.A.; (6) USDA Forest Service, FHP Region 1, Coeur d'Alene, ID, U.S.A.; (7) USDA Forest Service, FHP Region 2, Gunnison, CO, U.S.A.; (8) USDA Forest Service, FHP Region 2, Lakewood, CO, U.S.A.; (9) USDA Forest Service, FHP Region 3, Albuquerque, NM, U.S.A.

613-P WITHDRAWN

614-P Effects of vernalization on the differential ozone response of two winter wheat genotypes.

A. MASHAHEET (1), D. Marshall (2), K. Burkey (2), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) USDA-ARS, North Carolina State University, Raleigh, NC, U.S.A.

615-P Screening the monosomic lines of the Chinese Spring wheat variety for ozone tolerance.

A. MASHAHEET (1), D. Marshall (2), K. Burkey (2), R. Ullah (1), A. Abdelrhim (3), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) USDA-ARS, North Carolina State University, Raleigh, NC, U.S.A.; (3) North Carolina State University, Raleigh, NC, U.S.A.

616-P Spatio-temporal brown eye spot progress of irrigated coffee by central pivot

M. SILVA (1), M. Silva (2), E. Pozza (2), E. Chaves (3), G. Vasco (2), P. Paula (3), G. Dornelas (3), M. Silva (3), M. Resende (3), (1) UFLA, Lavras, Brazil; (2) Lavras Federal University, UFLA, Lavras, Brazil; (3) Lavras Federal University, UFLA, Brazil

617-P Effect of pre-anthesis rainfall patterns on fusarium head blight and deoxynivalenol in wheat: a multi-state study

W. BUCKER MORAES (1), K. F. Andersen (1), C. Cowger (2), R. Dill-Macky (3), L. V. Madden (1), P. Anderson Paul (1), (1) Department of Plant Pathology, The Ohio State University, Wooster, OH, U.S.A.; (2) Department of Plant Pathology, North Carolina State University, Raleigh, NC, U.S.A.; (3) Department of Plant Pathology, University of Minnesota, Saint Paul, MN, U.S.A.

618-P Changes in frequency of *Leptosphaeria maculans* avirulence genes in North Dakota.

S. MANSOURIPOUR (1), K. Chittam (1), Z. Liu (1), L. del Rio Mendoza (1), (1) North Dakota State University, Fargo, ND, U.S.A.

Pathogen Dispersal

619-P Transmission of *Rhodococcus* spp. causing pistachio bushy top syndrome in California

E. FICHTNER (1), S. Dhaouadi (1), T. Kapaun (2), J. Cardwell (3), (1) University of California Division of Agriculture and Natural Resources, Tulare, CA, U.S.A.; (2) University of California Division of Agriculture and Natural Resources, Exeter, CA, U.S.A.; (3) Companion Animal Clinic, Visalia, CA, U.S.A.

620-P Quantification of airborne inoculums of *Magnaporthe oryzae* by using TaqMan Real-time PCR

X. CHEN (1), K. Yuan (1), S. Wang (2), F. Guo (2), B. Wu (2), (1) China Agricultural University, Beijing, China; (2) China Agricultural University, China

621-P The seasonal dynamics of *Phyllosticta* spp. in Floridian citrus grove leaf litter

K. ZHANG (1), J. Rollins (2), M. Dewdney (3), (1) Plant Pathology Department, Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.; (2) Plant Pathology Department, University of Florida, Gainesville, FL, U.S.A.; (3) Plant Pathology Department, Citrus Research and Education Center, University of Florida, Lake Alfred, FL, U.S.A.

622-P Field observations of ascospore discharge of *Monilinia vaccinii-corymbosi* in northern highbush blueberries

G. DABBAH (1), A. Schilder (2), (1) CSU Monterey Bay, Seaside, CA, U.S.A.; (2) Michigan State University, Department of Plant, Soil and Microbial Sciences, U.S.A.

623-P A leaf litter and fruit brown rot life style of *Phytophthora syringae* in California citrus

C. FENG (1), B. Liu (1), M. Matheron (2), (1) University of Arkansas, U.S.A.; (2) University of Arizona, U.S.A.

624-P Specific TaqMan qPCR and a PvABC qPCR assays for monitoring airborne sporangia of *Plasmopara viticola* f. sp. *riparia*, *aestivalis* and *vinifera*.

O. CARISSE (1), M. Tremblay (2), A. Lefebvre (3), (1) Agriculture and AgriFood Canada, St-Jean-sur-Richelieu, QC, Canada; (2) Agriculture and Agroalimentaire Canada, Canada; (3) Agriculture and AgriFood Canada, Canada

625-P First report of the Asian citrus psyllid, vector of *Candidatus Liberibacter asiaticus* in Tanzania and their potential further spread in Africa

M. SHIMWELA (1), H. Narouei-Khandan (1), S. Halbert (2), M. Keremane (3), G. Minsavage (1), S. Timilsina (1), D. Massawe (4), J. Jones (1), A. van Bruggen (1), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Division of Plant Industry, Gainesville, FL, U.S.A.; (3) USDA, Riverside, CA, U.S.A.; (4) Sokoine University of Agriculture, Morogoro, Tanzania

626-P Genetic diversity of pathogenic *Clavibacter michiganensis* subsp. *michiganensis* strains from Central Chile

M. VALENZUELA (1), S. Fuentes (2), F. Claverias (2), X. Besoain (3), M. Seeger (4), (1) Centro de Biotecnología DAL, Universidad Técnica Federico Santa María, Valparaíso, Other, Chile; (2) Centro de Biotecnología DAL,

Universidad Técnica Federico Santa María, Valparaíso, Chile; (3) Escuela de Agronomía, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile; (4) Laboratorio de Microbiología Molecular y Biotecnología Ambiental, Universidad Técnica Federico Santa María, Valparaíso, Chile

627-P Spatiotemporal analysis of wheat blast epidemiology (*Magnaporthe oryzae* Triticum pathotype) under natural field conditions

K. MILLS (1), L. Madden (1), P. Paul (1), D. Salgado (1), (1) The Ohio State University, Wooster, OH, U.S.A.

628-P A Snapshot of Citrus Black Spot in Southwest Florida: Spatial Distribution in Two 'Valencia' Citrus Groves

K. HENDRICKS (1), P. Roberts (1), (1) University of Florida - IFAS|SWFREC, U.S.A.

629-P Sensitivity survey of *Alternaria* species to SDHI fungicides reveals regional and temporal resistance changes in pistachio orchards of California

P. LICHTENBERG (1), R. Puckett (1), C. Cunningham (2), V. Leschenne (3), T. Michailides (1), (1) University of California - Davis, Parlier, CA, U.S.A.; (2) Fresno State University, Fresno, CA, U.S.A.; (3) Swiss Federal Institute of Technology, Zurich, Switzerland

630-P Teratosphaeria pseudoeucalypti: an emerging pathogen with uncertain impact on *Eucalyptus* plantations

C. PEREZ (1), G. Balmelli (2), S. Simeto (2), E. a (3), M. Codina (3), R. García (3), N. Ramirez (3), O. Bentancur (3), M. Wingfield (4), (1) EEMAC, Universidad de la Republica, Paysandu, Uruguay; (2) INIA Tacuarembó, Uruguay; (3) EEMAC, Universidad de la Republica, Uruguay; (4) FABI, University of Pretoria, Uruguay

631-P WITHDRAWN

632-P The occurrence pattern of plant viruses and their vectors in pepper fields in Korea

S. KWON (1), S. Kwon (1), I. Cho (1), S. Choi (1), J. Yoon (1), G. Choi (1), (1) National Institute of Horticultural and Herbal Science, South Korea

633-P Field Survey of *Tospoviruses* Infecting Tomato in South Florida

O. ABDALLA (1), S. Zhang (1), (1) University of Florida, Homestead, FL, U.S.A.

634-P Spatial dynamics of a begomovirus disease in processing tomato in central Brazil

K. EL-TARABILY (1), S. AbuQamar (1), E. Saeed (1), A. Sham (1), (1) United Arab Emirates University, Al-Ain, Other, Uae

Pathogen-Vector Interactions

635-P WITHDRAWN

636-P Composition of leaf fibrous ring mediates *Diaphorina citri* preference of *Citrus sinensis* over *Citrus aurantium*.

H. SHUGART (1), M. Rogers (1), (1) University of Florida- Citrus Research & Education Center, Lake Alfred, FL, U.S.A.

637-P Transmission of a 16SrIII-L phytoplasma by leafhoppers (*Scaphytopius marginelineatus*) to cassava (*Manihot esculenta* Crantz) in Colombia

E. ALVAREZ (1), C. BETANCOURTH (1), (1) CIAT, Colombia

638-P Cladosporium interactions with the introduced insect spotted wing drosophila (*Drosophila suzukii*) may alter raspberry fruit rot epidemiology

C. SWETT (1), C. Carignan (1), K. Hamby (1), E. Koivunen (1), (1) University of Maryland, College Park, MD, U.S.A.

639-P The ability of *Olpidium brassicae* to vector blueberry mosaic virus in southern highbush blueberries

T. MILES (1), A. Shands (1), (1) CSU Monterey Bay, Seaside, CA, U.S.A.

640-P Olive Escudete, caused by *Botryosphaeria dothidea*, as Result of the Interaction fly-mosquito-fungus

J. MORAL (1), I. Eldesouki-Arafat (2), F. López-Escudero (3), E. Vargas-Osuna (2), T. Antonio (4), H. Aldebis (2), (1) University of California, Davis, Kearney Agricultural Research and Extension Center, Parlier, CA, U.S.A.; (2) Dpto. Ciencias y Recursos Agrícolas y Forestales, Universidad de Córdoba.

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641-P First report of laurel wilt on sassafras in Arkansas

R. OLATINWO (1), C. Barton (2), J. Hwang (3), W. Johnson (3), (1) USDA Forest Service, Southern Research Station, U.S.A.; (2) Arkansas Forestry Commission, U.S.A.; (3) USDA Forest Service, Forest Health Protection, U.S.A.

642-P WITHDRAWN

643-P Determination of vector population trends, species composition, and the role they play in the barley yellow dwarf complex in Northeastern Kansas.

M. RAMOS (1), D. Rotenberg (1), A. Laney (1), A. Kieffaber (1), A. Whitfield (1), (1) Kansas State University, Manhattan, KS, U.S.A.

644-P Variation in transmission of *Tomato spotted wilt virus* (TSWV) from *Thrips tabaci* is not solely influenced by virus titer within individual thrips

J. BROWN (1), A. Jacobson (2), G. Kennedy (1), S. Lommel (1), T. Sit (1), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Auburn University, Auburn, AL, U.S.A.

645-P WITHDRAWN

646-P Aphid-mediated potyvirus transmission: host plant chemistry, vector biology and component interactions

K. GADHAVE (1), B. Dutta (2), J. Schmidt (2), R. Srinivasan (2), (1) University of Georgia, Tifton, GA, U.S.A.; (2) University of Georgia, U.S.A.; (3) University of Georgia, GA, U.S.A.

647-P Transovarial and Sexual Transmission of *Tomato yellow leaf curl virus* in Whiteflies

W. MARCHANT (1), R. Srinivasan (1), (1) University of Georgia, Tifton, GA, U.S.A.

648-P Molecular interactions between citrus tristeza virus and its aphid vector, *Toxoptera citricida*

N. KILLINY (1), S. Harper (2), C. C. El Mohtar (2), B. Dawson (2), (1) University of Florida, IFAS, CREC, Department of Plant Pathology, Lake Alfred, FL, U.S.A.; (2) University of Florida, Department of Plant Pathology, Lake Alfred, FL, U.S.A.

Population Biology Genetics

649-P A strategy to study population variation of *Xanthomonas axonopodis* pv. *manihotis* using a new set of multiple-locus variable number tandem repeats.

L. RACHE CARDENAL (1), C. Flores (2), C. López (3), B. Szurek (2), C. Vernier (2), R. Koebnik (2), S. Restrepo (4), A. Bernal (4), (1) Universidad de los Andes, BOGOTA, Colombia; (2) UMR Interactions Plantes Microorganismes Environnement, IRD-Cirad-UM, Montpellier, France; (3) Universidad Nacional de Colombia, Colombia; (4) Universidad de los Andes, Colombia

650-P Diversity of *Aspergillus flavus* on important agricultural crops produced in Bangladesh

M. ISLAM (1), P. Cotty (2), (1) USDA ARS, Tucson, AZ, U.S.A.; (2) USDA-ARS, School of Plant Sciences, the University of Arizona, Tucson, AZ, U.S.A.

651-P The genetic structure, virulence, and fungicide sensitivity of *Fusarium fujikuroi* in Taiwan

C. CHUNG (1), Y. Chen (2), M. Lai (3), C. Wu (2), A. Cheng (2), T. Lin (3), A. Cheng (4), C. Yang (2), H. Wu (5), S. Chu (6), C. Kuo (7), Y. Wu (4), G. Lin (4), M. Tseng (8), Y. Tsai (9), C. Lin (10), C. Chen (11), J. Huang (11), H. Lin (2), (1) National Taiwan University, Taipei City, Taiwan; (10) Taitung District Agricultural Research and Extension Station, Taiwan; (11) National Chung Hsing University, Taiwan; (2) National Taiwan University, Taiwan; (3) Taiwan Agricultural Research Institute, Taiwan; (4) Tainan District Agricultural Research and Extension Station, Taiwan; (5) Taoyuan District Agricultural Research and Extension Station, Taiwan; (6) Miaoli District Agricultural Research and Extension Station, Taiwan; (7) Taichung District Agricultural Research and Extension Station, Taiwan; (8) Kaohsiung District Agricultural Research and Extension Station, Taiwan; (9) Hualien District Agricultural Research and Extension Station, Taiwan

- 652-P Exploring genetic diversity in *Macrophomina phaseolina*, the causal agent of charcoal rot on soybean**
V. ORTIZ LONDONO (1), M. Chilvers (1), K. Wise (2), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Purdue University, West Lafayette, IN, U.S.A.
- 653-P Population structure of the wheat pathogen *Zymoseptoria tritici* in France at different scales**
A. SIAH (1), L. EL CHARFOUNI (2), B. TISSERANT (2), P. HALAMA (1), P. REIGNAULT (3), (1) Institut Charles Viollette (EA 7394), Institut Supérieur d'Agriculture, Lille, France; (2) Unité de Chimie Environnementale et Interactions sur le Vivant (EA 4492), Université du Littoral Côte d'Opale, Calais, France; (3) Unité de Chimie Environnementale et Interactions sur le Vivant (EA 4492), Université du Littoral Côte d'Opale, Lille, France
- 654-P Stripe rust epidemics of wheat and barley and races of *Puccinia striiformis* identified in the United States in 2015**
X. CHEN (1), A. Wan (2), (1) USDA-ARS, Pullman, WA, U.S.A.; (2) Department of Plant Pathologist, Washington State University, Pullman, WA, U.S.A.
- 655-P Preliminary screening of genetic markers for population analyses of *Magnaporthe oryzae* Triticum pathotype.**
J. STACK (1), C. Cruz (1), S. Dobham (1) (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.
- 656-P Population structure and genetic diversity of *Fusicladium effusum* in the USA**
C. BOCK (1), M. Horchkiss (2), K. Stevenson (3), B. Wood (4), (1) USDA/ARS SE Fruit & Tree Nut Research Laboratory, 21 Dunbar Rd., Byron, GA, U.S.A.; (2) USDA-ARS SE Fruit and Tree Nut Research Laboratory, Byron, GA, U.S.A.; (3) Department of Plant Pathology, University of Georgia, Tifton, GA, U.S.A.; (4) USDA/ARS SE Fruit & Tree Nut Research Laboratory, Byron, GA, U.S.A.
- 657-P Spatial and temporal structure of *Sclerotinia sclerotiorum* in New York State**
A. DUNN (1), J. Kikkert (2), S. Pethybridge (3), (1) Hobart and William Smith Colleges, Geneva, NY, U.S.A.; (2) Cornell Cooperative Extension, Cornell Vegetable Program, Canandaigua, NY, U.S.A.; (3) Cornell University, Geneva, NY, U.S.A.
- 658-P Sub-lethal fungicides induce microsatellite mutation in *Sclerotinia sclerotiorum***
B. AMARADASA (1), S. Everhart (1), (1) University of Nebraska, Lincoln, NE, U.S.A.
- 659-P Molecular characterization and genetic diversity of *Mycosphaerella fijiensis* in Costa Rica using sequence based nuclear markers**
J. RISTAINO (1), A. Saville (1), M. Charles (1), M. Wyatt (1), S. Chavan (1), (1) North Carolina State University, Raleigh, NC, U.S.A.
- 660-P Genetic and phenotypic diversity of *Puccinia kuehnii* of sugarcane from Brazil**
T. MISTURA (1), A. Urashima (1), L. Porto (1), C. Sakuno (2), R. Arias (3), (1) Federal University of Sao Carlos, Brazil; (2) Syngenta Crop Protection, Brazil; (3) USDA, ARS, South Atlantic Area Nat Peanut Res Lab, U.S.A.
- 661-P WITHDRAWN**
- 662-P Short-term Host Selection Pressure Has Little Effect on the Evolution of *Verticillium dahliae***
K. PURI (1), S. Gurung (1), D. Short (2), G. Sandoya (3), R. Hayes (4), K. Subbarao (1), (1) University of California, Salinas, CA, U.S.A.; (2) Division of Plant and Soil Sciences, West Virginia University, Morgantown, WV, U.S.A.; (3) UC Davis Genome Center, Davis, CA, U.S.A.; (4) United States Department of Agriculture, Agricultural Research Service, Salinas, CA, U.S.A.
- 663-P Population structure of *Sclerotinia subarctica* in England, Scotland and Norway**
J. CLARKSON (1), R. Warmington (2), B. Nordskog (3), (1) Warwick Crop Centre, University of Warwick, United Kingdom; (2) The Eden Project, Bodelva, United Kingdom; (3) Norwegian Institute of Bioeconomy Research, Ås, Norway
- 664-P Tools for analysis of clonal population genetic data in R**
Z. KAMVAR (1), J. Brooks (2), N. Grünwald (3), (1) Oregon State University, Philomath, OR, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) USDA-ARS, Corvallis, OR, U.S.A.
- 665-P WITHDRAWN**
- 666-P Is host specificity influencing the population structure of *Phytophthora* spp. collected from potato and tree tomato in central and southern Colombia?**

C. CHAVES (1), M. Mideros (1), G. Danies (1), S. Restrepo (1), (1) Universidad de los Andes, Colombia

- 667-P Thirty-three years of lettuce downy mildew and counting: a phenotypic and genotypic narrative**
J. ZHANG (1), B. Lin (2), Q. Yang (2), N. Huang (2), H. Shen (2), X. Pu (2), D. Sun (2), (1) Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, Guangzhou, Other, China; (2) Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, China
- 668-P Population structure of *Pseudoperonospora cubensis* isolates in Michigan and Ontario, Canada**
J. BELLO (1), Y. Guo (1), M. Hausbeck (1), (1) Michigan State University, East Lansing, MI, U.S.A.
- 669-P A shift in the population of *Phytophthora infestans* on Egyptian potato crops.**
S. EL-GANAINY (1), Y. Ahmed (1), M. Soliman (1), A. Ismail (1), A. Tohamy (1), E. Randall (2), D. Cooke (2), (1) Plant Pathology Research Institute, Giza, Egypt; (2) The James Hutton Institute, Dundee, Scotland

Risk Assessment

- 670-P Evaluation of the microbial quality of cantaloupe fruit produced on raised or flat beds following a flooding event**
I. KIKWAY (1), M. Lewis Ivey (1), I. Kikway (1), (1) Louisiana State University, BATON ROUGE, LA, U.S.A.
- 671-P Weather patterns associated with Gibberella Ear Rot of Corn in Ohio**
F. DALLA LANA (1), R. Minyo (1), P. Thimison (1), L. V. Madden (1), P. A. Paul (1), (1) The Ohio State University, Wooster, OH, U.S.A.
- 672-P Evaluating soybean production in fields infested with *Heterodera glycines* and *Macrophomina phaseolina* with spatial regression analyses**
H. LOPEZ-NICORA (1), J. Carr (1), A. Dorrance (2), T. Niblack (1), (1) The Ohio State University, Columbus, OH, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.
- 673-P A model for predicting onset of *Stagonospora nodorum* blotch in winter wheat based on pre-planting and weather factors**
P. OJIAMBO (1), L. Mehra (1), C. Cowger (1), (1) North Carolina State University, U.S.A.
- 674-P WITHDRAWN**
- 675-P Incidence and severity of *Phytophthora* disease and assessment of inoculum levels in Texas citrus orchards**
S. CHAUDHARY (1), M. Setamou (1), O. Alabi (3), J. daGraca (1), M. Kunta (1), V. Ancona (1), (1) Texas A&M Kingsville Citrus Center, U.S.A.; (2) Texas A&M Kingsville Citrus Center, Weslaco, TX, U.S.A.; (3) Texas A&M AgriLife Research and Extension Center, U.S.A.; (4) Texas A&M Kingsville Citrus Center, TX, U.S.A.
- 676-P WITHDRAWN**
- 677-P Potential global distribution of blueberry twig blight (*Diaporthe vaccinii*) predicted by two species distribution modeling approaches.**
A. VAN BRUGGEN (1), H. Narouei-Khandan (1), C. Harmon (1), P. Harmon (1), C. Gardi (2), I. Koufakis (2), W. van der Werf (3), J. West (4), (1) University of Florida, Gainesville, FL, U.S.A.; (2) European Food Safety Authority, Parma, Italy; (3) Wageningen University, Wageningen, Netherlands; (4) Rothamsted Research, Harpenden, United Kingdom
- 678-P Symptomatology and epidemiology of *Exobasidium* leaf and fruit spot of blueberry**
R. INGRAM (1), H. Scherm (1), R. Allen (1), (1) University of Georgia, Athens, GA, U.S.A.
- 679-P Effect of soybean canopy closure on *Sclerotinia sclerotiorum* apothecia production, ascospore release, and primary plant infection of soybean**
M. FALL (1), M. Chilvers (1), A. Byrne (1), J. Wilbur (2), D. Smith (2), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) University of Wisconsin-Madison, Madison, WI, U.S.A.

680-P Modeling regulatory decisions in response to exotic pest detections: Pest case studies for decision makers

L. BROWN (1), L. Brown (1), (1) APHIS Plant Protection & Quarantine, Science & Technology, Raleigh, NC, U.S.A.

681-P An impact network analysis for management of Xanthomonas wilt of banana: adoption thresholds for regional success of single diseased stem removal

K. GARRETT (1), C. Ocimati (2), J. Ntamwira (3), G. Blomme (4), (1) University of Florida, U.S.A.; (2) Bioversity, Uganda; (3) Bioversity, DR Congo, DR Congo; (4) Bioversity, Ethiopia

682-P Seedborne inoculum thresholds of *Pseudomonas syringae* pv. *aptata*, causal agent of bacterial leaf spot, in 'baby leaf' Swiss chard crops

L. DU TOIT (1), M. Derie (1), B. Holmes (1), I. Safni (2), C. Bull (2), (1) Washington State University, Mount Vernon, WA, U.S.A.; (2) Pennsylvania State University, University Park, PA, U.S.A.

683-P Multilayer Networks Supporting Healthy Seed Systems for Smallholder Potato Producers in Tungurahua, Ecuador

J. HERNANDEZ NOPSA (1), J. Andrade-Piedra (2), G. Forbes (3), P. Kromann (4), S. Lei (5), J. Brisbane (5), K. Garrett (5), (1) University of Florida, Gainesville, FL, U.S.A.; (2) International Potato Center, CGIAR Research Program on Roots Tubers and Bananas (RTB), Lima, Peru; (3) International Potato Center, CGIAR Research Program on Roots Tubers and Bananas (RTB), Beijing, China; (4) International Potato Center, CGIAR Research Program on Roots Tubers and Bananas (RTB), Quito, Ecuador; (5) Plant Pathology Department, Emerging Pathogens Institute and Institute for Sustainable Food Systems, University of Florida, Gainesville, FL, U.S.A.

684-P WITHDRAWN**Systematics/Evolution****685-P Genetic diversity of *Pseudomonas syringae* causing bacterial leaf spot on table beet (*Beta vulgaris*) and Swiss chard (*Beta vulgaris* subsp. *cicla*)**

I. SAFNI (1), L. Ramos-Sepulveda (2), P. Goldman (3), M. Derie (4), L. du Toit (4), S. Koike (5), V. Stockwell (6), C. Bull (2), (1) Department of Agroecotechnology, Faculty of Agriculture, University of Sumatera Utara, Sumatera Utara, Indonesia; (2) Department of Plant Pathology and Environmental Microbiology, Penn State University, University Park, PA, U.S.A.; (3) USDA/ARS, Salinas, CA, U.S.A.; (4) Washington State University, Mount Vernon, WA, U.S.A.; (5) Univ of California Cooperative Extension, Salinas, CA, U.S.A.; (6) USDA/ARS, Corvallis, OR, U.S.A.

686-P Diversity and phylogeny of moko disease-causing *Ralstonia solanacearum* strains in Colombia

M. RAMIREZ (1), R. Jackson (2), V. Villegas-Escobar (3), J. Correa-Álvarez (3), C. Ramirez (1), (1) Universidad de Antioquia, Colombia; (2) Reading University, England; (3) Universidad Eafit, Colombia

687-P Phylogenomic analysis supports polyphyly in *Pythium sensu lato*

E. GOSS (1), M. Ascunce (2), J. Huguet-Tapia (2), E. Braun (2), A. Ortiz-Urquiza (2), N. Keyhani (2), (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, U.S.A.

Biochemistry and Cell Biology**688-P Identification of essential protein machinery involved in the plant disease resistance-signaling node in *Arabidopsis*, NDR1.****689-P Examining putative motility genes in *Clavibacter michiganensis* subsp. *michiganensis*.**

C. PERITORE (1), M. Tancos (2), C. Smart (2), (1) Cornell University, Ithaca, NY, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.

690-P Differential effects of *Fusarium thapsinum* on host nitric oxide (NO) synthesis among stalk rot resistant and susceptible sorghum lines

A. BANDARA (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.

691-P Stalk sugar content and charcoal rot disease reaction in grain sorghum

A. BANDARA (1), D. Weerasooriya (1), S. Liu (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.

692-P Spectral signatures of chemical changes in the wheat cell-wall resulting from stripe rust infection in compatible and incompatible near isogenic lines

R. LAHLALI (1), G. Brar (2), D. Qutob (3), C. Karunakaran (1), H. Kutcher (2), (1) Canadian Light Source Inc., Saskatoon, SK, Canada; (2) Department of Plant Sciences/Crop Development Centre, University of Saskatchewan, Saskatoon, Canada; (3) Canadian National Research Council- Plant Biotechnology Institute, Saskatoon, SK, Canada; (4) Department of Plant Sciences/Crop Development Centre, University of Saskatchewan, Saskatoon, SK, Canada

693-P WITHDRAWN**694-P Small RNA processing in *Sclerotinia sclerotiorum***

S. MARZANO (1), L. Domier (2), (1) South Dakota State University, Brookings, SD, U.S.A.; (2) USDA/ARS, University of Illinois, Urbana-Champaign, U.S.A.

695-P Investigation on the role of molecular composition and lignification of canola plant cell wall in resistance mechanisms associated with CR gene *Rcr1*

R. LAHLALI (1), T. Song (2), M. Chu (2), F. Yu (3), L. McGregor (2), B. Gossen (2), S. Kumar (2), C. Karunakaran (1), G. Peng (2), (1) Canadian Light Source Inc., Saskatoon, SK, Canada; (2) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (3) Agriculture and Agri-Food Canada, Saskatoon, Canada

696-P A sensitive method for quantifying cercosporin, a fungal-derived secondary metabolite, in plant tissue

J. SMITH (1), J. Lay (2), B. Bluhm (2), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Arkansas, U.S.A.

697-P Role of *Cryphonectria parasitica* Cdc48-like gene, CpCdc48 in regulation of growth & cell division.

D. KIM (1), (1) Chonbuk National University, Jeonju, South Korea

698-P Wheat streak mosaic virus-encoded NIA-Pro and coat protein are involved in virus superinfection exclusion

S. TATINENI (1), (1) USDA-ARS, Lincoln, NE, U.S.A.

699-P In planta interaction between *Tobacco mosaic virus* 126 kDa protein and a host membrane protein (SNARE) and its influence on virus RNA accumulation

R. NELSON (1), A. Ibrahim (1), J. Schoelz (2), (1) Samuel Roberts Noble Foundation, Inc., Ardmore, OK, U.S.A.; (2) University of Missouri, Columbia, MO, U.S.A.

Biotechnology**700-P Overexpression of a modified plant thionin enhances disease resistance to citrus canker and Huanglongbing (HLB, citrus greening)**

G. HAO (1), E. stover (1), (1) usda/ars/hrl, U.S.A.

701-P Transgenic Carrizo expressing 'Candidatus Liberibacter asiaticus' effector P235 displays Huanglongbing-like symptom and alters some gene expression

G. HAO (1), (1) usda/ars/hrl, U.S.A.

702-P Bioluminescent imaging as a sensitive tool for evaluation of *Ralstonia solanacearum* infection dynamics in resistant and susceptible pepper lines

H. DU (1), B. Chen (1), X. Zhang (1), S. Miller (2), G. Rajashekara (3), X. Xu (1), S. Geng (1), (1) Beijing Vegetable Research Center (BVRC) of BAAFS, China; (2) Department of Plant Pathology, Ohio Agricultural Research Development Center, Ohio State University, Wooster, U.S.A.; (3) Food Animal Health Research Program, Ohio Agricultural Research Development Center, Ohio State University, Wooster, U.S.A.; (4) Beijing Vegetable Research Center (BVRC) of BAAFS, Beijing, China

703-P Transgenic approaches for the genetic improvement of cowpea (*Vigna unguiculata*(L.)Walp) and soybean (*Glycine max*(L.) Merrill)

V. RAMACHANDRAN (1), (1) BHARAT UNIVERSITY, CHENNAI, India

- 704-P Co-expression of proteins by two virus vectors in the same cells of infected plants**
M. MENDOZA (1), H. Scholthof (1), (1) Texas A&M University, U.S.A.
- 705-P Displaying foreign proteins and peptides on the surface of *Pepino mosaic virus* virions**
C. LI (1), S. Shi (1), N. Yu (1), Z. Xiong (1), (1) University of Arizona, Tucson, AZ, U.S.A.
- 706-P A single nucleotide polymorphism at the right terminal region of Mexican papita viroid is a virulent determinant factor on tomato**
K. LING (1), R. Li (1), (1) USDA-ARS, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.

Molecular Plant-Microbe Interactions

- 707-P WITHDRAWN**
- 708-P Two complete genome sequences of a new pathovar of *Xanthomonas oryzae* infecting wild grasses provide insight into evolution of pathogenicity**
J. LANG (1), R. Koebnik (2), A. Pérez-Quintero (2), E. DuCharme (1), B. Szurek (2), J. Leach (1), V. Verdier (2), (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) Institut de recherche pour le développement (IRD), Montpellier, France
- 709-P Phytopathogenic interaction between *Herbaspirillum rubrisubalbicas* and different genotypes of Sorghum**
T. TULESKI (1), T. Tuleski (1), C. Espinoza (2), F. Plucani do Amaral (2), T. Pereira (2), R. Monteiro (4), E. Maltempi de Souza (4), F. Pedrosa (4), G. Stacey (2), (1) University of Missouri, Columbia, MO, U.S.A.; (2) University of Missouri, U.S.A.; (3) University of Missouri, Columbia, U.S.A.; (4) Federal University of Parana, Brazil
- 710-P Expression of *FLS2s* from ‘Nagami’ kumquat and ‘Sun Chu Sha’ mandarin enhance citrus canker resistance in ‘Duncan’ grapefruit**
V. FEBRES (1), Q. Shi (1), G. Moore (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 711-P Homologs of *CsLOB1* can function as disease susceptibility genes in citrus canker**
J. ZHANG (1), J. Tapia (1), Y. Hu (2), J. Jones (1), N. Wang (1), S. Liu (3), W. Frank (1), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, Beijing, P. R. China, Gainesville, FL, U.S.A.; (3) Kansas State University, Gainesville, FL, U.S.A.
- 712-P *Ca. Liberibacter asiaticus* carries a highly conserved, chromosomal CI repressor that binds an early gene promoter in its prophage.**
L. FLEITES (1), M. Jain (1), S. Zhang (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 713-P The Type II-dependent secretion of virulence factors is necessary for systemic colonization by the xylem-limited pathogen, *Xylella fastidiosa***
B. INGEL (1), P. Wang (2), (1) University of California Riverside, Riverside, CA, U.S.A.; (2) University of California Riverside, U.S.A.
- 714-P The chemotaxis regulator *pilG* of *Xylella fastidiosa* is required for virulence in *Vitis vinifera* grapevines**
H. LIN (1), X. Shi (2), (1) USDA-ARS, CA, U.S.A.; (2) USDA-ARS, U.S.A.
- 715-P Calcium supplementation in plants increases the virulence of *Xylella fastidiosa***
S. TRAORE (1), J. Oliver (1), A. Rashotte (1), P. Cobine (1), (1) Auburn University, Auburn, AL, U.S.A.
- 716-P Biological functional Analysis of *tatB* in *Acidovorax citrulli***
T. ZHAO (1), (1) Chinese academy of agricultural sciences, institute of plant protection, Beijing, China
- 717-P Secretome annotation in the citrus greening bacterial pathogen**
L. CANO (1), M. Pitino (2), Y. Duan (2), (1) University of Florida, Fort Pierce, FL, U.S.A.; (2) US Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.
- 718-P The bifunctional catalase/peroxidase KatG is required for pathogenicity of *Xanthomonas albilineans* on sugarcane**
M. JAIN (1), L. Fleites (2), S. Zhang (2), D. Gabriel (2), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Plant Pathology, University of Florida, U.S.A.
- 719-P The role of the tomato genotype in susceptibility to *Salmonella enterica***
M. TEPLITSKI (1), M. Teplitski (1), M. Marvasi (2), J. Giovannoni (3), (1) University of Florida, Gainesville, FL, U.S.A.; (2) Middlesex University, United Kingdom; (3) Boyce Thompson Institute, Cornell University, U.S.A.
- 720-P Determining the genetic basis for stomatal aperture modulation by *Salmonella enterica* serovar Typhimurium strain 14028.**
J. MONTANO (1), S. Porwollik (2), M. McClelland (2), M. Melotto (1), (1) Department of Plant Sciences, University of California, Davis, Davis, CA, U.S.A.; (2) Department of Microbiology and Molecular Genetics, University of California, Irvine, Irvine, CA, U.S.A.
- 721-P In vivo and in vitro investigation of the mobilization of pathogenicity islands of *Streptomyces***
Y. ZHANG (1), D. Bignell (2), R. Zuo (3), Q. Fan (4), J. Huguet-Tapia (1), Y. Ding (3), R. Loria (1), (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Biology, Memorial University of Newfoundland, St. John's, Newfoundland and Labrador, Canada; (3) Department of Medicinal Chemistry, University of Florida, Gainesville, FL, U.S.A.; (4) College of Plant Protection, Fujian Agriculture and Forestry University, Fuzhou, China
- 722-P WITHDRAWN**
- 723-P WITHDRAWN**
- 724-P Characterization of the T6SS secretion system of *Ralstonia solanacearum* and its role in virulence at low temperatures**
A. BOCSANCZY (1), J. Yuen (1), A. Mangravita-Novo (1), D. Norman (1), (1) University of Florida MREC, Apopka, FL, U.S.A.
- 725-P Global regulatory changes allow for the increased growth of *Salmonella* in soft rotted tomatoes**
A. GEORGE (1), A. George (2), (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, U.S.A.
- 726-P Expression of the *FST1* from *Fusarium verticillioides* in a yeast strain lacking a major myo-inositol transporter gene**
C. NIU (1), G. Payne (2), C. Woloshuk (3), (1) Purdue University, West Lafayette, IN, U.S.A.; (2) North Carolina State University, U.S.A.; (3) Purdue University, U.S.A.
- 727-P Evaluation of Rice Varieties for Resistance for Autumn Decline in Arkansas**
H. YAN (1), H. Zhang (2), M. Kim (3), B. Yoon (4), W. Shim (4), (1) Texas A&M University, Plant Pathology & Microbiology, Texas A&M University, College Station, TX, 77843, College Station, TX, U.S.A.; (2) Texas A&M University, Plant Pathology & Microbiology, Texas A&M University, College Station, TX, 77843, College Station, TX, U.S.A.; (3) Texas A&M University, U.S.A.; (4) Texas A&M University Electrical & Computer Engineering, Texas A&M University, College Station, TX, 77843, U.S.A.; (5) Texas A&M University Electrical & Computer Engineering, Texas A&M University, College Station, TX, 77843, TX, U.S.A.
- 728-P Global Analysis of Horizontal Gene Transfer in *Fusarium verticillioides***
S. GAO (1), J. Wisecaver (2), Y. Zhang (3), L. Ma (3), A. Rokas (2), S. Gold (4), A. Glenn (4), (1) Department of Plant Pathology, University of Georgia, Athens, GA, U.S.A.; (2) Department of Biological Sciences, Vanderbilt University, Nashville, TN, U.S.A.; (3) Department of Biochemistry and Molecular Biology, University of Massachusetts, Amherst, MA, U.S.A.; (4) USDA ARS, Richard B. Russell Research Center, Toxicology & Mycotoxin Research Unit, Athens, GA, U.S.A.
- 729-P A Battle in a Kernel: Molecular Exploration of Antagonisms between Two Maize Endophytes, *Fusarium verticillioides* and *Acremonium zeae***
M. GAO (1), A. Glenn (2), S. Gold (2), (1) The University of Georgia, Athens, GA, U.S.A.; (2) United States Department of Agriculture Toxicology and Mycotoxin Research Unit, Athens, GA, U.S.A.

- 730-P A dynamic regulatory network model underlying stomatal infection in *Cercospora zeae-maydis***
J. RIDENOUR (1), B. Bluhm (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.
- 731-P WITHDRAWN**
- 732-P Arabidopsis thaliana: A model host plant to study plant-pathogen interaction using rice false smut isolates of *Ustilagoideae virens***
J. LI (1), M. Andargie (2), (1) South China Botanical Garden, Chinese Academy of Sciences, China; (2) South China Botanical Garden, Chinese Academy of Sciences, China
- 733-P Macrophomina phaseolina promotes charcoal rot susceptibility in sorghum through induced host nitric oxide (NO) production**
A. BANDARA (1), D. Weerasooriya (1), S. Liu (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.
- 734-P Induced rhamnose biosynthesis in sorghum by *Macrophomina phaseolina* contributes to charcoal rot susceptibility**
A. BANDARA (1), D. Weerasooriya (1), S. Liu (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.
- 735-P Macrophomina phaseolina induces stalk senescence in charcoal rot susceptible sorghum genotypes through up-regulated host *chlorophyllase-2* biosynthesis**
A. BANDARA (1), D. Weerasooriya (1), S. Liu (1), C. Little (1), (1) Kansas State University, Manhattan, KS, U.S.A.
- 736-P Genome-wide study on cultivar-specific and stripe rust responsive miRNAs in *Triticum aestivum***
S. RAMACHANDRAN (1), N. Mueth (1), P. Zheng (1), S. Hulbert (1), (1) Washington State University, U.S.A.; (2) Washington State University, Pullman, WA, U.S.A.
- 737-P Genotype and chemotype profiles of endophytes associated with wild barley**
M. YI (1), J. Kaste (2), N. Charlton (1), W. Hendricks (1), N. Krom (1), P. Nagabhyru (3), D. Panaccione (4), C. Young (1), (1) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.; (2) Cornell University, Ithaca, NY, U.S.A.; (3) University of Kentucky, Lexington, KY, U.S.A.; (4) West Virginia University, Morgantown, WV, U.S.A.
- 738-P WITHDRAWN**
- 739-P Exploring the *Monilinia vaccinii-corymbosi*-blueberry pathosystem for the discovery of genes governing host-specificity.**
K. BANSAL (1), J. Rollins (1), (1) University of Florida, Gainesville, FL, U.S.A.
- 740-P Fungal transcriptome analysis of the *Sclerotinia sclerotiorum* and *Pisum sativum* interaction**
M. CHILVERS (1), J. Rojas (1), P. Santos (2), J. Wang (1), (1) Michigan State University, East Lansing, MI, U.S.A.; (2) University of Nevada, Reno, U.S.A.
- 741-P Aspartyl protease mediated cleavage of AtBAG6 triggers autophagy and fungal resistance in plants**
Y. LI (1), M. Kabbage (2), M. Dickman (1), (1) Texas A&M University, College Station, TX, U.S.A.; (2) University of Wisconsin-Madison, Madison, WI, U.S.A.
- 742-P WITHDRAWN**
- 743-P WITHDRAWN**
- 744-P The MAP kinase kinase kinase gene, *CpBck1*, regulates sectorization and pathogenicity of the phytopathogenic fungus *Cryphonectria parasitica*.**
D. KIM (1), (1) Chonbuk National University, Korea
- 745-P WITHDRAWN**
- 746-P WITHDRAWN**
- 747-P A band of misfits: role of unexpected proteins in the plant symbiotic signaling pathway**
M. VENKATESHWARAN (1), A. Wiley-Kalil (2), D. Jayaraman (3), M. Banba (4), A. Binder (5), S. Bernard (6), J. Maeda (6), M. Otegui (7), H. Imaizumi-Anraku (8), M. Parniske (5), J. Ané (9), (1) University of Wisconsin-Platteville, Platteville, WI, U.S.A.; (2) NDSU Williston Research Extension Center, U.S.A.; (3) University of Wisconsin-Madison, U.S.A.; (4) Division of Plant Sciences, National Institute of Agrobiological Sciences, Japan; (5) Ludwig-Maximilians-Universität München, Germany; (6) Department of Agronomy, University of Wisconsin, Madison, U.S.A.; (7) Department of Botany, University of Wisconsin-Madison, U.S.A.; (8) Division of Plant Sciences, National Institute of Agrobiological Sciences, U.S.A.; (9) Departments of Bacteriology and Agronomy, University of Wisconsin, Madison, WI, U.S.A.
- 748-P Functional analysis of root-knot nematode (*Meloidogyne javanica*) virulence genes in rice.**
D. FERNANDEZ (1), D. Fernandez (2), M. Grossi de Sá (3), I. Mezzalana (4), M. Beneventi (4), M. Lisei de Sá (5), D. Amora (4), H. Baimsey (6), A. Petitot (7), J. de Almeida Engler (8), É. Saliba Albuquerque (4), M. Grossi de Sá (4), (1) IRD - French Research Institute for Development, Montpellier cedex 5, France; (2) IRD - French Research Institute for Development, Montpellier, France; (3) IRD, Montpellier, France; (4) EMBRAPA CENARGEN, Brazil; (5) Epamig and Embrapa Cenargen, Brazil; (6) Parakou University, Benin; (7) IRD - French Research Institute for Development, France; (8) INRA, France
- 749-P WITHDRAWN**
- 750-P WITHDRAWN**
- 751-P MetacodeR: An R package for comparative analysis and visualization of microbial communities and evaluation of metabarcoding primer specificity**
Z. FOSTER (1), N. Grunwald (1), (1) USDA Agricultural Research Service / Oregon State University, Corvallis, OR, U.S.A.
- 752-P Molecular dissection of resistance signaling in watermelon fruit through transcriptomic approach**
M. MANDAL (1), J. Ikerd (2), A. Soorni (3), C. Kousik (2), (1) ORISE Participant sponsored by the U.S. Vegetable Laboratory, USDA, ARS., Charleston, SC, U.S.A.; (2) U.S. department of Agriculture, Agricultural Research Service, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.; (3) Department of Horticulture, Virginia Tech, Blacksburg, WV, U.S.A.
- 753-P Identification of silencing suppressor proteins in *Maize chlorotic mottle virus***
N. BACHELLER (1), H. Garcia-Ruiz (1), (1) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.
- 754-P Resistance of cultivated soybean to *Clover yellow vein virus* apparently originated during domestication from wild soybean**
- 755-P Examination of the mechanism of superinfection exclusion by *Citrus tristeza virus***
S. FOLIMONOVA (1), O. Atallah (1), S. Kang (2), (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, U.S.A.
- 756-P Exchange of HC-Pro cistron between *Soybean mosaic virus* and *Clover yellow vein virus*: Impact on pathogenicity**
- 757-P Devising a custom 13K unigene-based *Nicotiana benthamiana* microarray to study host-pathogen interactions at the transcriptome level**
P. THAMMARAT (1), P. Thamarat (1), T. Sit (2), S. Lommel (2), (1) Functional Genomics Program, North Carolina State University, Raleigh, NC, U.S.A.; (2) Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC, U.S.A.
- 758-P Reimagining the *Cauliflower mosaic virus* genome as an interactome between host and virus proteins**
J. SCHOELZ (1), R. Nelson (2), S. Leisner (3), C. Angel (4), (1) University of Missouri, Columbia, MO, U.S.A.; (2) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.; (3) University of Toledo, Toledo, OH, U.S.A.; (4) Cenicafe, Manizales, Colombia
- 759-P Two eIF4E proteins in Yellow Lantern chili pepper interact with *Pepper veinal mottle virus* VPg**
Z. ZHANG (1), N. Yu (1), X. Zhang (2), Y. Zhang (1), J. Wang (1), Z. Liu (3), Z. Xiong (4), (1) Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences, Haikou, China; (2) Institute of Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences, Haikou, China; (3) Chinese Academy of Tropical Agricultural Sciences, Haikou, China; (4) University of Arizona, Tucson, AZ, U.S.A.

Plant Defense Responses

760-P QTL Analysis of flg22-triggered Basal Resistance in Maize

X. ZHANG (1), P. Balint-Kurti (1), Stacey (2), Y. Cao (2), (1) North Carolina State University, U.S.A.; (2) University of Missouri, U.S.A.

761-P Physiological and Molecular-Genetic Characterization of Basal Resistance in Sorghum

J. KIMBALL (1), D. Chen (2), G. Stacey (2), P. Balint-Kurti (1), (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) University of Missouri, Columbia, MO, U.S.A.

762-P The Role of Ethylene in PAMP-Triggered Immunity in Fusarium Crown Rot (FCR) Disease Resistance in Wheat

S. ALLEN (1), X. Xiao (1), K. Bhide (1), S. Scofield (2), (1) Purdue University, West Lafayette, IN, U.S.A.; (2) USDA-ARS, Purdue University, West Lafayette, IN, U.S.A.

763-P Use of synchrotron Fourier transform spectroscopy to shed light on the chemical composition of cell wall appositions papillae on winter wheat leaf

R. LAHLALI (1), T. Song (2), C. Karunakaran (1), G. Peng (2), Y. Wei (3), (1) Canadian Light Source Inc., Saskatoon, SK, Canada; (2) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (3) Department of Biology, University of Saskatchewan, Saskatoon, SK, Canada

764-P miR858 functions as a negative regulator of plant susceptibility to the beet cyst nematode *Heterodera schachtii*

S. PIYA (1), T. Baum (2), T. Hewezi (1), (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.

765-P Agroinfiltration-based screening to discover new potato germplasm with resistance against *Globodera* nematode pests

S. CHEN (1), R. Cui (1), X. Wang (2), (1) Cornell University, Ithaca, NY, U.S.A.; (2) USDA-ARS, Ithaca, NY, U.S.A.

766-P WITHDRAWN

767-P Transcriptome analysis of resistance against *Phytophthora cinnamomi* and the role of β -cinnamomin elicitors in pathogenicity

M. ISLAM (1), H. Hussain (1), J. Rookes (2), A. Chambery (3), A. Schallmeyer (4), W. Oßwald (5), D. Cahill (2), (1) Deakin University, Waurin Ponds, Other, Australia; (2) Deakin University, Waurin Ponds, Australia; (3) Università degli Studi di Napoli, Italy; (4) RWTH Aachen University, Aachen, Germany; (5) Technische Universität München, Freising, Germany

768-P A synergistic effect of two plant antimicrobial peptides from defensin and lipid-transfer protein families towards *Phytophthora infestans*

E. ROGOZHIN (1), D. Zaytsev (2), (1) Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry Russian Academy of Sciences, Moscow, Russia; (2) Timiryazev Russian State Agrarian University, Moscow, Russia

769-P Wheat streak mosaic virus P1: Defining the minimal region required for the suppression of RNA silencing.

A. KASAMSETTY (1), G. Hein (2), S. Tatineni (1), (1) USDA-ARS and University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (2) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

770-P Construction of 13K unigene-based *Nicotiana benthamiana* microarray enables genome-wide studies in host-pathogen interaction

P. THAMMARAT (1), (1) Chiang Mai University, Chiang Mai, Thailand

771-P Proposing a custom 13K unigene-based *Nicotiana benthamiana* microarray to study host-pathogen interaction at genomic scale

P. THAMMARAT (1), P. Thamarat (1), (1) Chiang Mai University, Thailand; (2) Chiang Mai University, Chiang Mai, Thailand

772-P Development of HRM markers tightly linked to extreme resistance to *Potato virus Y* using next-generation sequencing

X. NIE (1), D. De Koeyer (1), A. Murphy (1), V. Dickison (1), M. Singh (2), (1) Fredericton Research and Development Centre, Agriculture and Agri-Food Canada, Fredericton, NB, Canada; (2) Agricultural Certification Services, Fredericton, NB, Canada

Proteomics/Metabolomics/Genomics

773-P The virulence function and regulation of the metalloprotease gene *prtA* in the bacterial plant pathogen, *Burkholderia glumae*

T. DE PAULA LELIS (1), J. Peng (1), S. Ostri (1), J. Hyun Ham (1), (1) Louisiana State University, Baton Rouge, LA, U.S.A.

774-P The genome of the endophytic *Curtobacterium* strain ER 1.4/2 and its potential as a biocontrol of several plant diseases.

L. CURSINO (1), K. Pawlak (2), G. Li (2), R. Worobo (3), (1) Keuka College, Keuka Park, NY, U.S.A.; (2) Hobart and William Smith Colleges, U.S.A.; (3) Cornell University, Ithaca, U.S.A.

775-P The *dlt* locus contributes to virulence in the necrotrophic pathogen *Pectobacterium carotovorum*

I. RUBIO (1), C. Guerin (1), R. Schaub (1), A. Charkowski (1), (1) University of Wisconsin-Madison, WI, U.S.A.; (2) University of Wisconsin-Madison, Madison, WI, U.S.A.

776-P Systematic computational network-based analysis to predict subnetwork modules associated with pathogenicity and fumonisins in *Fusarium verticillioides*

M. KIM (1), B. Yoon (1), W. Shim (1), (1) Texas A&M Univ., College Station, TX, U.S.A.

777-P Computational and functional analyses of MADS-box transcription factor-mediated regulation of fumonisin biosynthesis in *Fusarium verticillioides*

A. HILTON (1), A. Hilton (1), M. Kim (1), C. Ortiz (2), C. Woloshuk (3), B. Yoon (2), W. Shim (2), (1) Texas A&M University, College Station, TX, U.S.A.; (2) Texas A&M University, College Station, U.S.A.; (3) Purdue University, West Lafayette, IN, U.S.A.

778-P WITHDRAWN

779-P Independent amplification of a housekeeping gene and its evolutionary significance in the Dothideomycetes

B. DHILLON (1), G. Kema (2), S. Goodwin (3), B. Bluhm (1), (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) Plant Research International, Wageningen University and Research Centre, Wageningen, Netherlands; (3) USDA/ARS Purdue University, West Lafayette, IN, U.S.A.

780-P Transcriptomic analysis identifies specificity in *Fusarium verticillioides* metabolic response to *Bacillus mojavensis* lipopeptides

A. BLACUTT (1), S. Gold (2), (1) University of Georgia, Athens, GA, U.S.A.; (2) USDA-ARS TMRU, Athens, GA, U.S.A.

781-P Temporal succession of an *Aspergillus flavus* biocontrol agent in commercial cornfields in Texas

M. SEXTON (1), I. Carbone (1), J. White (1), T. Isakeit (2), (1) Center for Integrated Fungal Research, North Carolina State University, Raleigh, NC, U.S.A.; (2) Texas A&M University, U.S.A.

782-P Comparative genomics of S and L morphotypes of *Aspergillus flavus*

M. OHKURA (1), M. Ohkura (1), P. Cotty (2), M. Orbach (1), (1) School of Plant Sciences, University of Arizona, Tucson, AZ, U.S.A.; (2) Agricultural Research Services USDA, University of Arizona, Tucson, AZ, U.S.A.

783-P Functional characterization of candidate effector proteins identified from the wheat scab fungus *Fusarium graminearum*

S. LU (1), M. Edwards (1), S. Lu (1), (1) USDA-ARS Cereal Crops Research Unit, Fargo, ND, U.S.A.

- 784-P Analysis of a ketide synthase from fungal endophytes of toxic locoweeds**
A. NOOR (1), D. Baucom (2), D. Cook (3), R. Creamer (2), (1) Molecular Biology, New Mexico State University, Las Cruces, NM, U.S.A.; (2) New Mexico State University, U.S.A.; (3) USDA, ARS, Logan, UT, U.S.A.; (4) New Mexico State University, Las Cruces, NM, U.S.A.
- 785-P A metabolomic approach to investigate the putative role of drought stress in Esca disease of grapevine**
M. LIMA (1), A. Machado (1), W. Gubler (1), (1) University of California Davis, Davis, CA, U.S.A.
- 786-P PiCS, a predicted protein-protein interactome of the frog eye leaf spot pathogen *Cercospora sojina***
A. SUBEDI (1), B. Musungu (1), M. Geisler (2), B. Bluhm (3), A. Fakhoury (1), (1) Southern Illinois University Carbondale, Carbondale, IL, U.S.A.; (2) Southern Illinois University Carbondale, Carbondale, U.S.A.; (3) University of Arkansas Fayetteville, Fayetteville, AR, U.S.A.
- 787-P Comparative analysis of predicted proteomes from forma speciales of *Fusarium oxysporum* causing palm wilt**
S. PONUKUMATI (1), S. Ponukumati (2), J. Huguet (2), J. Rollins (2), M. Elliott (1), (1) University of Florida, Fort Lauderdale, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.
- 788-P Fungal endophyte community analysis of green coffee beans: a comparison across growing regions and qualities**
R. CAPOUYA (1), T. Mitchell (1), V. Devi Ganeshan (1), (1) The Ohio State University, Columbus, OH, U.S.A.
- 789-P Transcriptomic response of *Fusarium verticillioides* associated with nitrogen availability and development of sugarcane pokahh boeng disease**
M. ZHANG (1), Z. Lin (2), J. Wang (3), Y. Bao (3), Q. Guo (3), C. Powell (1), S. Xu (3), B. Chen (3), (1) IRREC-IFAS, University of Florida, Fort Pierce, FL, U.S.A.; (2) Guangxi University, Nanning, China; (3) Guangxi University, China
- 790-P Metagenomic analysis of oomycete communities in rhizosphere soil from field pea on the Canadian prairies using Illumina Miseq**
B. GOSSEN (1), S. Chatterton (2), N. Foroud (3), A. Esmaili Taheri (3), D. McLaren (3), (1) AAFC, Lethbridge, AB, Canada; (2) AAFC, Lethbridge, Canada; (3) AAFC, Canada
- 791-P Apple replant disease and the -omics: interaction of apple rootstock metabolome and the soil microbiome**
R. LEISSO (1), M. Mazzola (2), (1) USDA-ARS, Wenatchee, WA, U.S.A.; (2) USDA-ARS, U.S.A.
- 792-P Differential metabolome analysis of field-grown maize kernels in response to drought stress**
L. YANG (1), J. Fountain (1), X. Ni (2), R. Lee (1), S. Chen (3), B. Scully (2), R. Kemerait (1), B. Guo (2), (1) University of Georgia, U.S.A.; (2) USDA-ARS, U.S.A.; (3) University of Florida, U.S.A.
- 793-P Comparison of *Fusarium graminearum* transcription factors affecting *Fusarium graminearum* virus 1 accumulation based on phenome analysis**
J. YU (1), Y. Lee (1), K. Kim (1), (1) Seoul National University, Korea
- 794-P Root transcriptome analysis reveals viral diversity in two species of blueberry**
J. OLMSTEAD (1), R. Alcalá-Briseño (2), A. Varsani (3), J. Polston (2), N. Saad (2), (1) Horticultural Sciences Department, University of Florida, U.S.A.; (2) Department of Plant Pathology, University of Florida, FL, U.S.A.; (3) School of Biological Sciences, University of Canterbury, Christchurch, New Zealand; (4) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.
- 795-P WITHDRAWN**
- 796-P Replication and transcription are independently modulated for each *Banana bunchy top virus* DNA component**
N. YU (1), H. Xie (1), J. Wang (1), X. Zhang (1), Z. Liu (1), Z. Xiong (2), (1) Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences, Haikou, China; (2) University of Arizona, Tucson, AZ, U.S.A.
- 797-P Identification of defense-related genes associated with tomato Sw-7 line against Tomato spotted wilt virus in tomato through transcriptome analysis**
C. PADMABHAN (1), Y. Zheng (2), R. Shekaste-band (3), K. Stewart (1), J. Scott (3), Z. Fei (2), K. Ling (1), (1) USDA-ARS, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.; (2) Boyce Thompson Institute for Plant Research, Ithaca, NY, U.S.A.; (3) University of Florida, IFAS, Gulf Coast Research and Education Center, Wimauma, FL, U.S.A.
- 798-P Transcriptome profiling to discover defense-related genes associated with resistance line *ty-5* against Tomato yellow leaf curl virus in tomato**
C. PADMABHAN (1), Y. Zheng (2), R. Shekaste-band (3), K. Stewart (1), D. Hasegawa (1), J. Scott (3), Z. Fei (4), K. Ling (1), (1) USDA-ARS, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.; (2) Boyce Thompson Institute for Plant Research, Ithaca, NY, U.S.A.; (3) University of Florida, IFAS, Gulf Coast Research and Education Center, Wimauma, FL, U.S.A.; (4) zf25@cornell.edu, Ithaca, NY, U.S.A.

Outreach and Engagement

- 799-P National Seed Health System: standardizing seed health practices in the United States for seed exports**
N. GONZALEZ (1), T. Bruns (1), G. Munkvold (2), (1) Iowa State University, Ames, IA, U.S.A.; (2) Iowa State University, U.S.A.
- 800-P Implementation of a Quality Management System in an ISO 17025 Accredited Plant Pathogen Diagnostic Laboratory.**
D. PICTON (1), A. Barth (1), K. Burch (2), P. Shiel (2), (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville, MD, U.S.A.; (2) USDA-APHIS-PPQ-S&T-CPHST, Raleigh, NC, U.S.A.
- 801-P eFile and the USDA Animal Plant Health Inspection Service's (APHIS) PPQ Pest Permitting Process**
J. ABAD (1), J. Abad (1), (1) USDA-APHIS, Riverdale, MD, U.S.A.
- 802-P National Clean Plant Network for Roses**
K. ONG (1), D. Byrne (2), D. Golino (3), N. Anderson (2), S. Sim (3), B. Pemberton (4), (1) Texas Plant Disease Diagnostic Lab, Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.; (2) Department of Horticultural Sciences, Texas A&M University, College Station, TX, U.S.A.; (3) Foundation Plant Services, University of California-Davis, Davis, CA, U.S.A.; (4) Texas A&M AgriLife Research, Overton, TX, U.S.A.

Professional Development

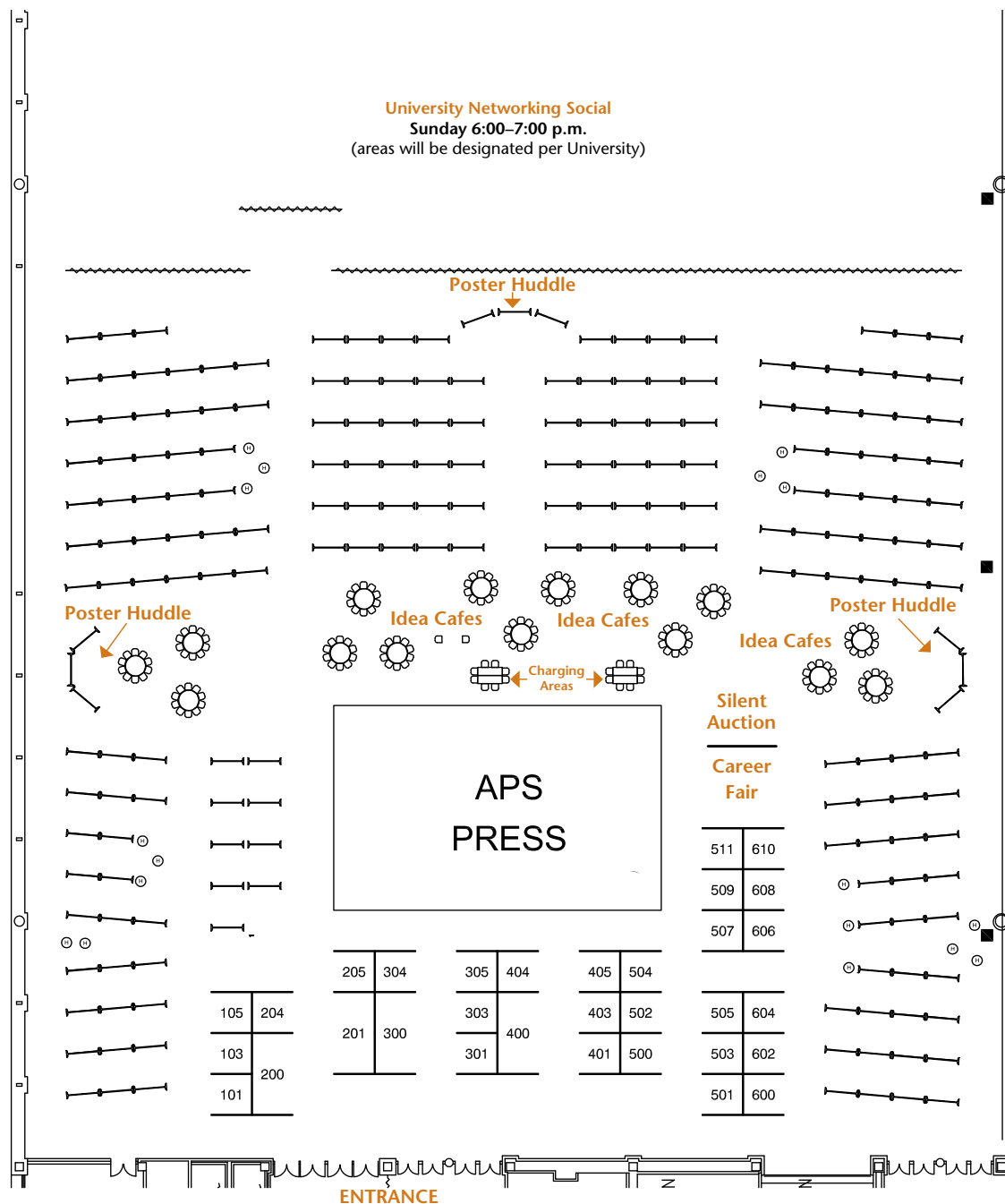
- 803-P Master in Plant Health Management: education and training to meet 21st century trends and challenges in Extension and industry**
M. LEWANDOWSKI (1), A. Dorrance (2), L. Canas (3), B. Kleinke (4), E. Roche (5), J. Schoenhals (6), S. Williams (1), F. Peduto Hand (1), J. Jasinski (7), M. Gardiner (3), P. Paul (2), A. Londo (6), (1) The Ohio State University, Department of Plant Pathology, Columbus, OH, U.S.A.; (2) The Ohio State University, Ohio Agricultural Research and Development Center, Department of Plant Pathology, Wooster, OH, U.S.A.; (3) The Ohio State University, Ohio Agricultural Research and Development Center, Department of Entomology, Wooster, OH, U.S.A.; (4) Ohio State University Extension, Xenia, OH, U.S.A.; (5) Ohio State University Extension, Cleveland, OH, U.S.A.; (6) Ohio State University Extension, Columbus, OH, U.S.A.; (7) Ohio State University Extension, Urbana, OH, U.S.A.

Teaching and Learning

- 804-P Virtual disease management using Blightpro DSS**
M. MCKELLAR (1), I. Small (1), W. Fry (1), (1) Cornell University, Ithaca, NY, U.S.A.

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. Exhibitors are listed as of June 10, 2016. Visit www.apsnet.org/meet for updates. Floor plan can also be found on the mobile app.



Exhibitors

Exhibitor list in numerical order of assigned booth numbers.

- | | | | | | |
|-----|---------------------------|-----|---|-----|--|
| 101 | Optigene Ltd. | 401 | Gylling Data Management | 507 | Bugwood Center at UGA |
| 103 | APS Diagnostics Committee | 403 | The British Society for Plant Pathology | 509 | APS Public Policy Board |
| 105 | American Peat Technology | 404 | DuPont Crop Protection | 511 | Office of Public Relations and Outreach |
| 200 | USDA-APHIS | 405 | Conviron | 600 | Dino-Lite Scopes (BigC) |
| 201 | ADAMA | 500 | Percival Scientific, Inc. | 602 | 2017 APS Annual Meeting & 2018 International Congress of Plant Pathology |
| 204 | AC Diagnostics, Inc. | 501 | BIOREBA AG/Eurofins BioDiagnostics | 604 | ACSESS Alliance of Crop, Soil & Environmental Science Societies |
| 205 | Path Sensors, Inc. | 502 | Surface Optics Corporation | 606 | Diagenetix, Inc. |
| 300 | Monsanto | 503 | Springer | | |
| 301 | Agdia, Inc. | 504 | Biolog Inc. | | |
| 304 | Biochambers Inc. | 505 | UNL Doctor of Plant Health | | |

APS MEETING EXHIBITORS

Exhibitors are listed as of June 10, 2016. Floor plan can also be found on the meeting mobile app. THANK YOU to all our 2016 exhibitors for being part of this meeting! Exhibitor list in alphabetical order with descriptions.

Booth #204 AC Diagnostics, Inc. • Sustaining Associate
1131 W. Cato Springs Road, Fayetteville, AR 72701
Phone: +1.479.595.0320; Fax: +1.479.251.1791
E-mail: infor@acdiainc.com;
Web: www.acdiainc.com
AC Diagnostics, Inc. (ADC, Inc.), a leading diagnostic company, provides high-quality diagnostic products with affordable rates. ACD, Inc. offers ELISA reagents/kits and immunocapture PCR kits for testing more than 300 of plant pathogens. We also provide diagnostic tests for veterinary diseases and food safety, nanotech products, testing services, and contract researches.

Booth #604 ACSESS Alliance of Crop, Soil & Environmental Science Societies
5585 Guilford Road, Madison, WI 53711
Phone: +1.608.268.4967;
E-mail: tnewell@sciencesocieties.org;
Web: www.dl.sciencesocieties.org
The Alliance of Crop, Soil, and Environmental Science Societies (ACSESS) is an association of prominent international scientific societies. ACSESS was created by and is composed of the American Society of Agronomy (ASA) the Crop Science Society of America (CSSA), and the Soil Science Society of America (SSSA).

Booth #201 ADAMA
3120 Highwoods Blvd # 100, Raleigh, NC 27604
Phone: 1.866.406.6262
E-mail: help@adama.com; Web: www.adama.com
At ADAMA, we strive for a world where everybody has food security, and everybody in farming has a fulfilling and rewarding life. We are introducing our new product NIMITZ that kills parasitic nematodes. NIMITZ represents a safer alternative for nematode control with a new mode of action and simpler label.

Booth #301 Agdia, Inc. • Sustaining Associate
52642 County Road 1, Elkhart, IN 46514
Phone: +1.574.264.2014; Fax: +1.574.264.2153
E-mail: info@agdia.com; Web: www.agdia.com
Agdia, Inc. is the leading provider of diagnostic test kits for plant pathogen and transgenic traits. Our comprehensive range of testing solutions includes ELISA, ImmunoStrips, molecular diagnostics and a full service testing laboratory. The Agdia team looks forward to meeting with you to learn more about your diagnostic needs.

Booth #105 American Peat Technology • Sustaining Associate
36203 350th Avenue, Aitkin, MN 56431
Phone: +1.218.927.1888; Fax: +1.218.927.3272
E-mail: info@americanpeattech.com; Web: <http://americanpeattech.com/>
American Peat Technology has manufactured quality microbial carrier media since 2003. We produce granular and powdered carriers from Minnesota-harvested reed-sedge peat. Our bioAPT media is the industry standard for granular Rhizobia formulations. Stop by

our booth to see how APT can support your solutions for sustainable agriculture.

Booth #602 2017 APS Annual Meeting – 2018 ICPP
3340 Pilot Knob Road, St. Paul, MN 55121
Phone: +1.651.454.7250; Fax: +1.651.454.0766
Web: www.apsnet.org/meet
APS heads to San Antonio, Texas for 2017 and hosts the 2018 International Congress of Plant Pathology in Boston, Massachusetts. Stop by and check out these great opportunities.

Booth #103 APS Diagnostics Committee
3340 Pilot Knob Road, St. Paul, MN 55121
Phone: +1.651.454.7250; Fax: +1.651.454.0766
Web: www.apsnet.org
The mission of the APS Diagnostics Committee is to encourage networking and discussion among our members, to facilitate learning related to diagnostics, and to increase visibility of diagnostics within the profession of plant pathology and APS. Stop by our booth and test your plant disease knowledge with Diagnostics Jeopardy.

Booth #511 APS Office of Public Relations and Outreach (OPRO)
3340 Pilot Knob Road, St. Paul, MN 55121
Phone: +1.651.454.7250; Fax: +1.651.454.0766
Web: www.apsnet.org/members/outreach/opro
OPRO's mission is to demonstrate the value of plant pathology to society and provide resources for members to use in outreach efforts. Find out how you can share the plant pathology message; stop by the OPRO Booth at the annual meeting.

Booth #509 APS Public Policy Board (PPB)
3340 Pilot Knob Road, St. Paul, MN 55121
Phone: +1.651.454.7250; Fax: +1.651.454.0766
Web: www.apsnet.org/members/outreach/ppb
PPB provides scientific input on public policy issues to policy makers and agency personnel; advocates for increased funding for agricultural research, extension, and education; and works with other scientific organizations and coalitions to increase the awareness of the science of plant pathology. Stop by the PPB booth to learn more about the exciting Phytobiomes Roadmap and how you can become involved!

Booth #304 BioChambers Incorporated • Sustaining Associate
477 Jarvis Avenue, Winnipeg, Manitoba R2W 3A8
Canada
Phone: +1.204.589.8900; Fax: +1.204.582.1024
E-mail: info@biochambers.com;
Web: www.biochambers.com
At BioChambers our focus is on building positive client experiences. We achieve this by delivering top of class reach-in plant growth chambers and walk-in rooms, providing excellent sales and service, and introducing innovative designs to the marketplace. Please stop by our booth to pick up our latest information and to discuss your specific growth chamber needs.

- Booth #504 Biolog**
21124 Cabot Blvd, Hayward, CA 94545
Phone: +1.410.885.2780
Email: smontgomery@biolog.com;
Web: www.biolog.com
Biolog is a pioneer in the development of powerful cellular analysis tools for solving critical problems in clinical, pharmaceutical, and biotechnology research and development. In addition to our Microbial Identification Systems, Biolog's unique Phenotype MicroArray technology can be used to assay cells of all types, from microbial to mammalian.
- Booth #501 BIOREBA AG/Eurofins BioDiagnostics *Sustaining Associate***
1821 Vista View Drive, Longmont, CO 80504
Phone: +1.303.651.6417 or +1.408.846.9964;
Fax: +1.303.772.4003
E-mail: bioreba@eurofinsus.com; Web: www.eurofinsus.com/biodiagnostics/bioreba-ag/
Eurofins BioDiagnostics Laboratories and BIOREBA AG are partners in providing agrodiagnostic products and services for results you can trust. Eurofins-BDI Laboratories, a leading independent diagnostic laboratory, is the exclusive distributor of BIOREBA products in the United States. Eurofins-BDI offers effective seed quality, plant pathogen diagnosis, and disease eradication services for agricultural industries. BIOREBA's R&D laboratory develops and produces reagents and complete ready-to-use kits for the detection of plant pathogens..
- Booth #403 The British Society for Plant Pathology (BSPP)**
Charles Darwin House, 12 Roger Street, London WC1N 2 JU, United Kingdom
Phone: +44.20.7685.2550
Email: secretary@bspp.org.uk; Web: www.bspp.org.uk
The British Society for Plant Pathology (BSPP) welcomes members from around the world and all branches of plant pathology. We support the interests of plant pathologists worldwide via our website (<http://www.bspp.org.uk/>), newsletter, annual meeting and our three international journals. We fund travel, short-term visiting fellowships, student bursaries and innovation projects.
- Booth #507 Bugwood Center at UGA**
4601 Research Way, Tifton GA 31793
Phone: +1.229.386.3298; Fax: +1.229.386.3352
E-mail: bugwood@uga.edu; Web: www.bugwood.org
We develop partnerships to advance invasive species management, integrated pest management and forest health. By providing ready access to relevant information and tools, such as images and occurrence data, we empower stakeholders to make cost-effective management decisions that minimize disruptions to non-target organisms in the ecosystem and effectively control pests.
- Booth #405 Conviron • *Sustaining Associate***
590 Berry Street, Winnipeg, Manitoba R3H 0R9, Canada
Phone: +1.204.786.6451; Fax: +1.204.786.7736
E-mail: info@conviron.com;
Web: www.conviron.com
Conviron is a global supplier of controlled environment systems for plant science research. We offer an extensive product portfolio of single and multi-tier chambers and rooms as well as research greenhouses, much of which is customized to a client's specific requirements. To help ensure project success, we also offer specialized services from early-stage engineering and design through to installation, project commissioning and on-going maintenance and support.
- Booth #606 Diagenetix, Inc.**
2013 Clement Street, Honolulu, HI 96822
Phone: +1.808.542.4503; Fax: +1.808.946.4923
Email: rkubota@diagenetix.com;
Web: www.diagenetix.com
Diagenetix, Inc. provides a mobile gene-based diagnostic platform compatible with all isothermal DNA/RNA amplification technologies. This new handheld instrument, the BioRanger™, in combination with a free Android™ OS App, enables on-site application of real-time, fluorescence-based molecular diagnostic technologies.
- Booth #600 Dino-Lite Scopes (BigC)**
19803 Hamilton Av, Ste. 200, Torrance, CA 90502
Phone: +1.310.618.9990
E-mail: sales@dinolite.us; Web: www.dinolite.us
Dino-Lite portable digital microscopes provide high-quality microscopy video interfacing to PC and MAC. Most models provide 10x-220x magnification with features such as adjustable polarizer and Extended Depth of Field. The included software allows for image and video capture, measurement, and annotation.
- Booth #404 DuPont Crop Protection**
974 Centre Road, Chestnut Run Plaza, Wilmington DE 19805
Phone: +1.229.563.4326; Web: www.dupont.com/production_agriculture/en_us
DuPont Crop Protection combines global innovation with local collaboration to provide sustainable tools for insect, nematode, weed and disease control. We help growers improve the quality, yield, and profitability of their crops, while minimizing the environmental impact. By working together, we can find ways to improve the sustainability of the world's food supply.
- Booth #401 Gylling Data Management • *Sustaining Associate***
405 Martin Blvd, Brookings, SD 57006
Phone: +1.605.692.4021
E-mail: GDM.ARM.Support@gdmdata.com;
Web: www.gdmdata.com
Providing research software since 1982. ARM: establish, manage, analyze, and report information for crop experiments including field and greenhouse protocols and trials. Tablet Data Collector: enter and analyze assessments, take plot pictures, record trial GPS locations. ST: summarize and report a trial series across locations and/or years; links with Trial Database.

- Booth #300 Monsanto • *Sustaining Associate***
800 N Lindbergh Boulevard, Saint Louis, MO, 63167
Phone: +1.314.694.1000
Web: www.monsanto.com
Monsanto is committed to bringing a broad range of solutions to help nourish our growing world. We produce seeds for fruits, vegetables and key crops—such as corn and soybeans—that help farmers have better harvests while using water and other important resources more efficiently. Through programs and partnerships, we collaborate with farmers, researchers, nonprofit organizations, universities and others to help tackle some of the world's biggest challenges.
- Booth #305 Novogene Corporation**
823 Anchorage Place, Chula Vista, CA 91914
Phone: 1.877.230.9060
E-mail: support@novogene.com;
Web: www.novogene.com
Novogene is a leading provider of NGS and bioinformatics analysis services. With one of the largest sequencing capacities in the world, we deliver publication-ready data rapidly at highly competitive pricing. Having completed 10,000 projects and sequenced 140,000 samples for 6,000 global customers, Novogene offers a track record of performance and reliability.
- Booth #101 OptiGene Ltd. • *Sustaining Associate***
Blachford Road, Horsham, West Sussex RH13 5QR
Country: United Kingdom
Phone: +44 1403-274980; Fax: +44 1403-271017
E-mail: info@optigene.co.uk;
Web: www.optigene.co.uk
OptiGene develops the highest quality instrumentation and performance-leading reagents to support isothermal amplification of DNA and RNA. A continuous programme of development is maintained at OptiGene in order to satisfy the evolving demands of its customers and the wider market.
- Booth #205 PathSensors, Inc.**
701 E. Pratt Street, Baltimore, MD 21202
Phone: +1.443.557.6150
E-mail: info@pathsensors.com;
Web: www.pathsensors.com
PathSensors, Inc. is a leading biotechnology and environmental testing company. Using CANARY® technology, PathSensors products deliver extremely rapid and accurate detection of bacteria, viruses, and fungi in a variety of plant samples. The technology is easy-to-use and available in several platforms for field testing as well as in the lab.
- Booth #500 Percival Scientific, Inc. • *Sustaining Associate***
505 Research Drive, Perry IA 50220
Phone: +1.515.465.9363; Fax: +1.515.465.9464
E-mail: sales@percival-scientific.com;
Web: www.percival-scientific.com
Percival Scientific - Helping You Create Better Science
We design and deliver innovation and reliability into plant growth chambers, biological incubators and special application research chambers for universities, government institutions and corporations both domestically and internationally. Let us help you create better science.
- Booth #400 PhytoTechnology Laboratories**
PO Box 12205, Shawnee Mission, KS 66282
Phone: +1.913.341.5343 or 1.888.749.8682;
Fax: 1.888.449.8682
E-mail: sales@phytotechlab.com;
Web: www.phytotechlab.com
PhytoTechnology Laboratories® is a leading supplier of tissue culture media, reagents, biochemicals and supplies for plant tissue culture and plant molecular biology research. Carrying more than 900 high-quality, competitively-priced products for the plant sciences, discover the difference PhytoTech products can make in your research. Visit us online at www.phytotechlab.com.
- Booth #503 Springer**
233 Spring Street, New York NY 10013
Phone: +1.212.460.1600
E-mail: exhibits-ny@springer.com;
Web: www.springer.com
Looking to publish your research? Discover Springer's print and electronic publication services, including open access! Get high-quality review, maximum readership and rapid distribution. Visit our booth or springer.com/authors. You can also browse key titles in your field and buy (e)books at discount prices. With Springer you are in good company.
- Booth #502 Surface Optics Corporation**
11555 Rancho Bernardo Road, San Diego, CA 92127
Phone: +1.858.675.7404
E-mail: sales@surfaceoptics.com
Surface Optics Corporation (SOC) provides unparalleled expertise in the characterization and exploitation of optical properties of surfaces. SOC offers a line of unique Hyperspectral cameras, ideal for lab and field application of research in plant sciences. Come visit our booth for a live demo of the 710-VP hyperspectral camera!
- Booth #505 UNL Doctor of Plant Health**
1875 N 38th St., 279E Plant Sciences Hall, PO Box 830933, Lincoln, NE 68583-0933
Phone: +1.402.472.3365 or +1.402.450.4938; Fax: 402-472-3300
E-mail: dph@unl.edu; Web: dph.unl.edu
The Doctor of Plant Health program is an innovative model for educating plant health practitioners. DPH is a professional program similar to a medical or veterinary program, but instead, graduates are prepared to understand and diagnose plant health issues and manage the entire plant production system.
- Booth #200 USDA-APHIS**
4700 River Road, Riverdale, MD 20737
Phone: +1.301.851.2167; Web: www.aphis.usda.gov
The USDA's Animal and Plant Health Inspection Service protects the health and value of America's agricultural and natural resources. Within APHIS, Plant Protection and Quarantine protects against risks associated with the entry, establishment, or spread of agricultural pests and diseases, and Biotechnology Regulatory Services regulates certain genetically-engineered organisms by, among other things, evaluating their potential plant pest risks.

CONGRATULATIONS TO THE 2016 APS FOUNDATION AWARDEES



The following 67 individuals received awards from the APS Foundation in 2016, totaling \$39,797. Awardees will be recognized during the Opening General Session on Sunday morning. Special thanks to everyone who donated to the APS Foundation! Remember to visit the Foundation's booth to learn more about funding opportunities and to help support future leaders in plant pathology!

Books for the World Award

Therese Atcham Agneroh, National Polytechnic Institute Felix Houphouët-Boigny
Tinatín Doolotkeldieva, Kyrgyz-Turkish Manas University

Browning Plant Medicine and Health Travel Award

Joshua Jay Miller, University of Nebraska-Lincoln

French-Monar Latin American Award

Renan Macedo, Universidade Federal de Goiás

Lucy Hastings de Gutiérrez Award for Excellence in Teaching

Forrest W. Nutter, Jr., Iowa State University

Frank L. Howard Undergraduate Fellowship Award

Allison Izsak, Cornell University

International Travel Award

Lucia Maramara Borines, Visayas State University

JANE International Service Award

Jean B. Ristaino, North Carolina State University

Noel T. Keen Award for Research Excellence in Molecular Plant Pathology

Adam J. Bogdanove, Cornell University

Don and Judy Mathre Educational Endowment Award Members of the South Dakota State University Plant Science Department:

Phillip Alberti, Paul N. Okello, Taylor Olson, John Posch

Don & Judy Mathre Student Educational Award

Nichole Ginnan, University of California-Riverside

16th I. E. Melhus Graduate Student Symposium

Sara Klee, The Pennsylvania State University
Michael L. O'Leary, University of California-Davis
Jeannette Rapicavoli, University of California-Riverside
Alicia Truchon, University of Wisconsin-Madison
Yucheng Zhang, University of Florida

Schroth Faces of the Future Early Career Professionals Symposium

Daniel J. Anco, Clemson University
Nik J. Cunniffe, University of Cambridge
Sydney E. Everhart, University of Nebraska
Chakradhar Mattupalli, The Samuel Roberts Noble Foundation
Hillary L. Mehl, Virginia Tech Tidewater AREC

Raymond J. Tarleton Student Fellowship

Aparna Petkar, University of Georgia

STUDENT TRAVEL AWARDS

UNDERGRADUATE STUDENT TRAVEL AWARD

Dow AgroSciences Student Travel Award & Joseph M. Ogawa Student Travel Award
Scott D. Cosseboom, Cal Poly Strawberry Center

GRADUATE STUDENT TRAVEL AWARDS

José and Silvia Amador Student Travel Award
Juliana Pereira, University of Florida

Elsie J. and Robert Aycock Student Travel Award
Chase R. Crowell, Cornell University

Kenneth F. Baker and R. James Cook Student Travel Award
Minglu Gao, University of Georgia

Kenneth and Betty Barker Student Travel Award & John M. Barnes Student Travel Award
Ellie Walsh, The Ohio State University

Myron K. Brakke Student Travel Award
Alfredo Diaz Lara, Oregon State University

William Malcolm Brown, Jr. Student Travel Award & Landis International Student Travel Award
Mason J. Newark, University of Florida

J. Artie and Arra Browning Student Travel Award
James Orrock, University of Florida

C. Lee Campbell Student Travel Award
Karasi B. Mills, The Ohio State University

Caribbean Division Student Travel Award
Mayra Parra, Universidad de Los Andes

Gustaaf A. and Ineke C. M. de Zoeten Student Travel Award
Nicole Bacheller, Nebraska Center for Virology

H. J. Dubin Student Travel Award in honor of the Peace Corps
Mayara Mari Murata, University of Florida

Eddie Echandi Student Travel Award
Davide Sardella, University of Malta

Zahir Eyal Student Travel Award

Andrew Edward Sathoff, University of Minnesota

Forest Pathology Student Travel Award

Dixie Daniels, Oregon State University

John F. Fulkerson Student Travel Award

Russell J. Ingram, University of Georgia

Robert W. Fulton Student Travel Award

Brian Allen Hodge, The Ohio State University

Joseph P. Fulton Student Travel Award & Dennis Hall Student Travel Award

Nathan F. Miller, North Carolina State University

Richard Gabrielson Student Travel Award

Abby Beissinger, Washington State University
NWREC

Efrat Gamliel-Atinsky Student Travel Award

ChengFang Hong, University of Georgia

Raymond G. Grogan Student Travel Award

Yiwen Xiang, University of Illinois

Stephen A. Johnston Student Travel Award

Camilo H. Parada Rojas, North Carolina State University

Arthur Kelman Student Travel Award

Prem P. Kandel, Auburn University

Kyung Soo Kim Student Travel Award & Evanthia D. and D. G. Kontaxis Student Travel Award

Alex Corrion, Michigan State University

Tsune Kosuge Student Travel Award

Alex Blacutt, University of Georgia

Joseph Kuć Student Travel Award

Jonathon E. Smith, University of Arkansas

Stuart D. Lyda Student Travel Award & Harry E. Wheeler Student Travel Award

Morgan A. Gray, University of California-Berkeley

Don E. Mathre Student Travel Award

Michelle E. Marks, University of Wisconsin

William Moller Student Travel Award

Robin Choudhury, University of California-Davis

Donald E. Munnecke Student Travel Award

Haoxi Li, University of Georgia

John S. Niederhauser Student Travel Award

Jillian M. Lang, Colorado State University

Albert Paulus Student Travel Award

Rodger John Belisle, University of California-Riverside

Roger C. Pearson Student Travel Award

Madeline Dowling, Clemson University

Malcolm and Catherine Quigley Student Travel Award

Zhian N. Kamvar, Oregon State University

Eugene E. Saari Student Travel Award & John F. Schafer Student Travel Award

Emily A. Meyers, North Carolina State University

Milt and Nancy Schroth Student Travel Award

Frances Baker Browne, University of Georgia

Luis Sequeira Student Travel Award

Claudio Vrisman, The Ohio State University

Malcolm C. Shurtleff Student Travel Award

Rachel Medina, The Ohio State University

Janell M. Stevens Johnk Student Travel Award

Joshua Havill, University of Minnesota

H. David Thurston Student Travel Award

Daniel Chen, University of California-Riverside

Turfgrass Pathology Student Travel Award

Elisha Allan-Perkins, University of Massachusetts

Virology Student Travel Award

Elizabeth Cieniewicz, Cornell University

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Peter Ojiambo, *North Carolina State University, U.S.A.*

Naidu Rayapati, *Washington State University, U.S.A.*

Jeffrey A. Rollins, *University of Florida, U.S.A.*

APS Elected and Appointed Officers, Representatives, and Committees for 2016

These listings reflect current appointments as of May 1, 2016. For up-to-date listings following the meeting, please refer to *APSnet*

APS Elected and Appointed Officers, Representatives, and Committees for 2016

These listings reflect current appointments as of May 1, 2016. For up-to-date listings following the meeting, please refer to the APS website.

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President-Elect: T. D. Murray

Vice President: M. E. Palm

Immediate Past President: R. Bennett

Internal Communications Officer: D. M. Gadoury

Treasurer: S. A. Slack

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Councilor-at-Large: L. J. du Toit

Councilor-at-Large: P. Vincelli

Divisional Councilor: L. E. Datnoff

Publications Councilor: N. Grunwald

Executive Vice President: A. L. Hope

Academic Unit Leader Forum (AULF): *Chair:* L. S. Pierson. *Immediate Past Chair:* J. M. Bradeen. *Vice Chair:* T. L. Niblack.

Annual Meetings Board: *Director:* A. O. Charkowski. *Program Chair:* T. D. Murray. *Innovation Co-Chair:* P. S. Ojiambo. *Section Co-chair-Biology and Disease Management:* C. Avila-Adame. *Section Chair-Epidemiology:* K. L. Ivors. *Section Co-chair-Biology and Disease Management:* N. A. Rayapati. *Field Trips and Workshops Chair:* J. E. Weiland.

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APS Historian: *Historian:* P. D. Peterson.

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Ghanim, M., (39-O)
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