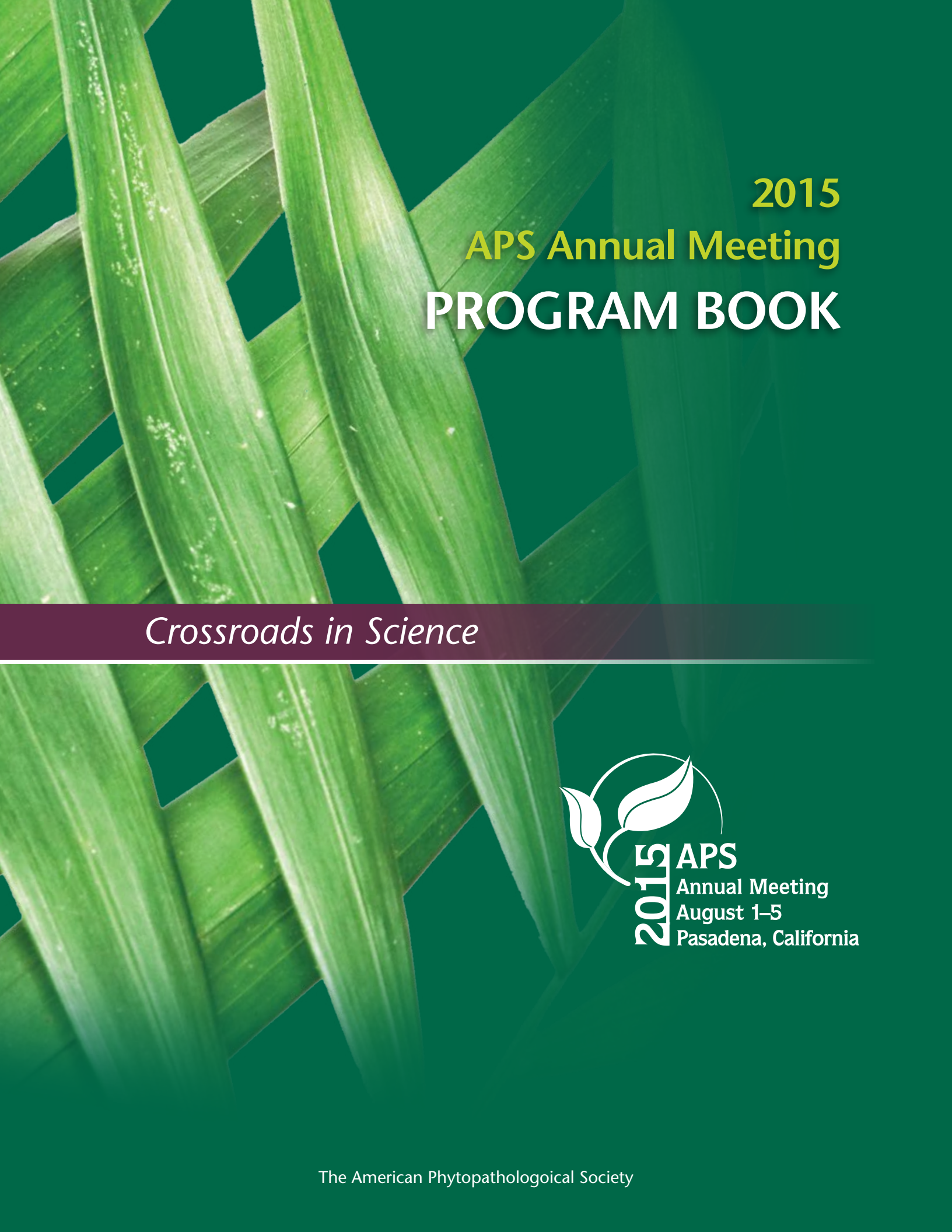

2015
APS Annual Meeting
PROGRAM BOOK

Crossroads in Science

2015 APS
Annual Meeting
August 1–5
Pasadena, California

The American Phytopathologoical Society

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Welcome to the 2015 APS Annual Meeting

On behalf of The American Phytopathological Society, I'm pleased to welcome you to Pasadena for the 2015 Annual Meeting. The theme of this year's annual meeting, "Crossroads in Science," reflects the unique position our discipline holds within the broad field of plant sciences. Our meeting will offer the latest advances, innovations, and discoveries as we explore new ways to connect with the worldwide community of scientists. Our Plenary Sessions will offer a dynamic look into the future of our science, and we will have fun examining generational perspectives among our membership. Our scientific program will include special sessions, workshops, technical sessions, and 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 relationships, and meet the next generation of plant pathologists.

Welcome to the 2015 APS Annual Meeting. We're glad to see you in Pasadena!

Rick Bennett, APS President

We are coming together this week to share the latest science in the plant pathology community and to explore great work in interconnected disciplines. I am excited about the opportunities to learn, share, and network through posters, technical and special sessions, plenary sessions, and plenty of social events. Students, don't be shy and join in the mix, introduce yourselves to fellow scientists and educators, join a committee, contribute to Idea Cafés, or join the discussion around a Poster Huddle. The meeting app will help us all stay organized and remember all of our "must do" events. Let's all have a great meeting in the beautiful "City of Roses!"

Sally Miller, APS Program Chair and President-Elect

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.

Table of Contents

Advertiser Index

Connect at the Meeting and All Year Long

Get Social—*Share Your Meeting Experience*

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

- On Twitter? Use #APS15 throughout the meeting and follow @plantdisease.
- Like The American Phytopathological Society on Facebook.
- Join The American Phytopathological Society group on LinkedIn.
- Subscribe to the APS YouTube channel: www.youtube.com/plantdisease.
- Follow APS on Pinterest: www.pinterest.com/plantdisease.

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.

Huntington Gardens

Free Admission for APS Annual Meeting Attendees

Located on the outskirts of Pasadena, Huntington Gardens is offering **FREE ADMISSION** to the gardens to each meeting attendee showing their **meeting name badge** at the entrance! The spectacular Huntington Gardens, began from land purchased in 1903 by Henry Huntington, is now home to more than a dozen spectacular gardens and over 15,000 plant variations spread across 120 acres.

APS extends a *THANK YOU* to Huntington Gardens for the generous offer and for hosting and assisting in the planning of several field trips and the Talk A Walk (scientific sessions) held during the APS meeting.

Huntington Gardens, 1151 Oxford Road, San Marino, CA 91108
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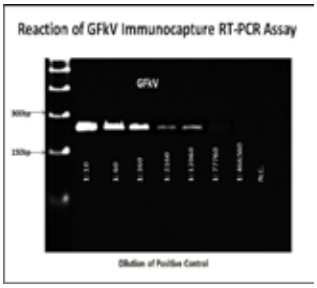

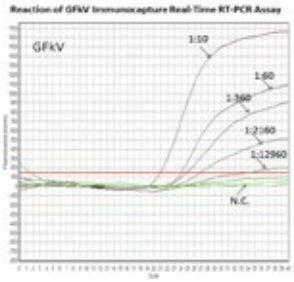

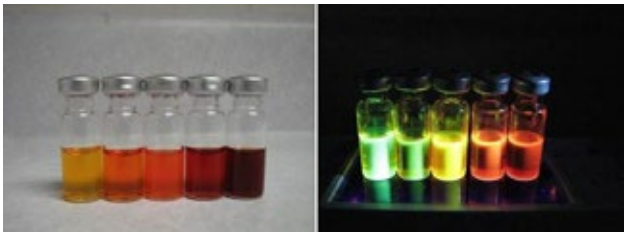

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App into the 2015 Meeting!

Mobile App—It's the Meeting at Your Fingertips!

Why use the app? Same content plus more features than the program book. It is quick, easy to use, and a green effort for the environment...**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
- **Access** poster presenters' audio preview of their poster (internet access required)
- **Connect** with your iPad-specific version
- **Schedule Posters by Appointment** 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.

2014 APS•CPS Joint Meeting August 9–13 Minneapolis, Minnesota

Registration Hours

Hall AB Foyer, Convention Center

Saturday, August 1	12:00 – 6:00 p.m.
Sunday, August 2	7:00 a.m. – 6:00 p.m.
Monday, August 3	7:00 a.m. – 5:30 p.m.
Tuesday, August 4	7:00 a.m. – 5:30 p.m.
Wednesday, August 5	7:30 a.m. – 1:00 p.m.

Exhibit and Poster Hours

Hall AB, Convention Center

Sunday, August 2

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 3

7:30 a.m. – 8:00 p.m.	Poster Viewing
10:00 a.m. – 6:00 p.m.	Exhibits Open
3:30 – 4:00 p.m.	Poster Huddles – *see page 18 for a list of topics*
4:00 – 6:00 p.m.	Poster Viewing with Authors Present *If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster board where you can be found.*
4:00 – 5:00 p.m.	Posters 1 – 403 *(even-numbered posters)*
5:00 – 6:00 p.m.	Posters 404 – 807 *(even-numbered posters)*

Tuesday, August 4

7:30 a.m. – 6:00 p.m.	Poster Viewing
10:00 a.m. – 6:00 p.m.	Exhibits Open
3:30 – 4:00 p.m.	Poster Huddles – *see page 19 for a list of topics*
4:00 – 6:00 p.m.	Poster Viewing with Authors Present *If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.*
4:00 – 5:00 p.m.	Posters 1–403 *(odd-numbered posters)*
5:00 – 6:00 p.m.	Posters 404–807 *(odd-numbered posters)*
6:00 – 8:00 p.m.	Exhibit Take-Down

Wednesday, August 5

8:00 – 10:00 a.m.	Poster Take-Down

Open Meeting Rooms

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

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.

Speaker Ready Room

205, Convention Center

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

Saturday, August 1 ..... 4:00 – 8:00 p.m.
Sunday, August 2 ..... 7:00 a.m. – 7:00 p.m.
Monday, August 3 ..... 7:00 a.m. – 5:30 p.m.
Tuesday, August 4 ..... 7:00 a.m. – 5:30 p.m.
Wednesday, August 5 ..... 7:00 a.m. – 12:00 p.m.

Talent Connections

It's all about networking when it comes to a job or candidate search. The APS Annual Meeting is the perfect venue for making critical connections. Post copies of your job or candidate information on the Job Board by the Registration Desk. During the Early Career Professionals' Social on Monday, candidates can hear first-hand from employers about various career opportunities. Don't forget, the online APS Job Center provides access to the jobs and candidates year-round.

Looking for Breakfast, Lunch, Beverage, or Snack?—Try Starbucks

Breakfast and lunch items in addition to coffee, specialty coffee drinks, beverages, and more are available Monday through Friday from 7:00 a.m. to 4:00 p.m. at Starbucks located in the Pasadena Convention Center.

Support Budding Plant Pathologists Through 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 2015 Foundation awardees and funding initiatives for 2016 and beyond. Donors contributing $100 or more to the fund of their choice receive an APS Foundation water bottle. Students donating at least $20 will be entered into a drawing to win a $500 travel grant to next year's annual meeting!

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 11th Annual Silent Auction. Proceeds fund the APS Office of International Program's Global Experience Program. Support this effort with your bids on Sunday, August 2, 12:00 – 6:00 p.m.

MEETING FACILITIES

Pasadena Convention Center
300 East Green Street
Pasadena, CA 91101
626.795.9311

Hilton Pasadena
168 South Los Robles Avenue
Pasadena, CA 91101
626.577.1000

Sheraton Pasadena
303 Cordova Street
Pasadena, CA 91101
626.449.4000

Courtyard by Marriott
180 North Fair Oaks Avenue
Pasadena, CA 91103
626.403.7600

Westin
191 North Los Robles Avenue
Pasadena, CA 91101
626.792.2727

Offsite Venues

Industry & Extension Networking Event

Monday, August 3, 6:30 – 9:30 p.m.
Castle Green (*walking distance from convention center*)
99 South Raymond Avenue
Pasadena, CA 91105
626.793.0359

Committee for Diversity and Equality presents "Perception versus Reality: Moving Your Career Forward Despite the Obstacles" Workshop

Tuesday, August 4, 6:30 – 8:30 p.m.
El Portal
695 East Green Street
Pasadena, CA 91101
626.795.8553

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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APS Reaches Out with Global Connections through Live Streaming

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

- Opening General Session and Awards & Honors Ceremony • Sunday, August 2, 10:30 a.m. – 12:00 p.m.
- Plenary Session I • Monday, August 3, 1:00 – 3:00 p.m.
- Plenary Session II • Tuesday, August 4, 1:00 – 2:00 p.m.
- Scientific Session: Phytobiome-Plant Interactions: Bridging Phytobiome Structure and Function • Monday, August 3, 8:30 – 11:30 a.m.
- Scientific Session: Nematology: From Microbiomes to Management • Tuesday, August 4, 8:30 – 11:30 a.m.
- Scientific Session: Climate Cycles, Climate Forecasting, and Disease Cycles Spanning Multiple Years • Wednesday, August 5, 8:30 – 9:45 a.m.
- Scientific Session: Banana Production at the Crossroads: Impact of *Fusarium oxysporum* f. sp. *cubense* TR4 • Wednesday, August 5, 10:15 – 11:45 a.m.

Back for a second year! PhytoView Sessions

Protecting Seed Health: More than the Eye Beholds

Sunday, August 2, 1:00 – 2:15 p.m.; Ballroom C, Convention Center

The Phytobiomes Initiative: Something for Everyone

Tuesday, August 4, 2:15 – 3:30 p.m.; Ballroom E, 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 17 of the Program Book.

Back for a second year! Idea Cafés

Monday, August 3, 10:30 – 11:30 a.m.; Exhibit Hall AB, Convention Center

Tuesday, August 4, 2:15 – 3:15 p.m.; Exhibit Hall AB, Convention Center

Looking for 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 20 of the Program Book.

APS Opening General Session and Awards & Honors Ceremony

Sunday, August 2, 10:30 a.m. – 12:00 p.m.; Civic Auditorium, 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 SESSION I

Monday, August 3, 1:00 – 3:00 p.m., Civic Auditorium, Convention Center

California's Drought and Drought Response

Doug Parker– Ph.D., Director, California Institute for Water Resources, University of California, Agriculture and Natural Resources, Oakland, California, U.S.A.

California is now into its fourth year of record-breaking drought. Water restrictions and a call for mandatory reductions have impacted all users of water in California. These historic conditions have everyone looking for a silver bullet solution to California's drought.

The fact is that in this large and semi-arid state, water is intimately tied to every aspect of life. To understand California's water situation, one must recognize a fundamental paradox: Enough will never be enough. We are a land-rich but water-limited state, and increased supply leads to more demand, which makes answers to California's water challenges complex, involving a combination of policy, technology, and conservation.

Doug Parker is director of the California Institute for Water Resources where he has held that position since 2011. He is also strategic initiative leader for water quality, quality and security at the University of California, Division of Agriculture and Natural Resources in Oakland. Prior to becoming director of the California Institute for Water Resources, Parker was the director of the Mid-Atlantic Water Program at the University of Maryland at College Park and associate professor in Cooperative Extension.

Crossroads in Science

Michael Rogers – Author, Technology Pioneer, and Futurist

The 21st century has brought enormous opportunities to the life sciences: big data, cognitive computing, and increasingly inexpensive tools for genomics. But the challenges have grown also, from the needs and impacts of a still-rising world population to the decrease in public funding for research and development. Add to that a generalized public mistrust of any work that involves "genetic engineering," and you have a complex environment indeed. What kind of careers lay ahead for young scientists, with the rise of peer-to-peer innovations like crowdfunding and open access journals? How do older researchers adapt to disciplines that seem increasingly driven by algorithms? And what is the responsibility of scientists to speak out on global issues that may well threaten life as we know it? Find answers to

(continued)

these questions and more at this thought-provoking and insightful session.

Michael Rogers most recently served as futurist-in-residence for *The New York Times*. He has worked with companies ranging from FedEx, Boeing, and Genentech to Microsoft, Pfizer, and Siemens, focusing on how companies can think about the future in useful ways. He speaks to audiences worldwide and is a regular guest on radio and television.

PLENARY SESSION II

When Generations Connect: Communicating with Four Generations of Employees

Tuesday, August 4, 1:00 – 2:00 p.m.; Civic Auditorium, Convention Center

Scott Zimmer – Generation Expert, BridgeWorks (Bridging the Generational Divide), Minneapolis, Minnesota, U.S.A.

Four distinct generations are working together shoulder to shoulder, each with a unique set of attitudes, values, and work styles. It used to be that older workers were bosses and younger ones took orders. Now, roles are all over the map and rules are being rewritten. Businesses and institutions are feeling the pain of generations and they struggle to manage productivity and morale while maintaining high standards and morale. This program will give you the tools to convert this form of diversity from an obstacle to an opportunity.

Scott Zimmer (Generation Xer) is a writer, market researcher and generational expert with BridgeWorks, a Minneapolis based company that has been dedicated to bridging the generational divide in the workplace and marketplace for more than 16 years. A child of the 80s and 90s, Zimmer has insider knowledge into what makes these generations tick. Sandwiched between the idealistic Boomers and the innovative Millennials, his Xer lens allows him to hone in on the key challenges facing each generation.

BridgeWorks is dedicated solely to the study of generational differences and has two best sellers *When Generations Collide: Who They Are. Why They Clash. How to Solve the Generational Puzzle at Work* and *The M Factor: How the Millennial Generation Is Rocking the Workplace.*

Final Night Celebration—California Dreamin'

Wednesday, August 5, 6:00 – 9:00 p.m.; Outside Plaza, Civic Auditorium, Convention Center

APS takes to the streets during this outdoor celebration that goes into the night and under the stars. Enjoy California fusion cuisine, great conversation, and music by the Lucky Devils 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. Guests' tickets are available for purchase at the Registration Desk.

LEADERSHIP INSTITUTE: EI and IP– Core Tools for Science Leaders

Saturday, August 1, 8:30 a.m. – 4:30 p.m.; Monterey Room, Hilton

Organizers: Janna Beckerman, Purdue University, West Lafayette, IN, U.S.A.; Bill Schneider, USDA ARS, Fort Detrick, MD, U.S.A.
Sponsoring Committee: APS Leadership Institute Committee
Sponsored in-part by: Monsanto

New this year, you'll gain the benefit of a two-part interactive workshop with the morning focused on Emotional Intelligence (EI), a break for lunch with a networking opportunity, and an afternoon concentrating on Influence and Persuasion (IP). This year's workshop features expert facilitators in these core leadership areas from the Center for Nonprofit Management. The workshop is substantially supported by the APS Council as a priority for APS leadership development and also provided, in part, by support from Monsanto. In addition to this support, attendee fees help cover your individual assessment, workshop materials, continental breakfast, coffee breaks, and lunch.

	SUNDAY	MONDAY
8:30– 9:45 a.m.		**TECHNICAL SESSION:** Fungicide Resistance-Session 1 • Ballroom G, CC **TECHNICAL SESSION:** Pathogen Detection Technologies-Session 1 • Ballroom H, CC
8:30 – 11:30 a.m.		**SPECIAL SESSION:** 15th I. E. Melhus Graduate Student Symposium - From Local to Global: New Developments in Disease Risk Prediction and Crop Loss Assessment • Ballroom A, CC **SPECIAL SESSION:** Advances in Gene Silencing • Ballroom B, CC **SPECIAL SESSION:** Engagement in Plant Pathology: You Can't Start Too Early • Ballroom C, CC **SPECIAL SESSION:** Mycotoxins: From Production, Secretion, and Detection to Effects on Plants and Mammals • Ballroom D, CC **SPECIAL SESSION:** Phytobiome-Plant Interactions: Bridging Phytobiome Structure and Function, *(livestreamed)* • Ballroom E, CC
10:15 – 11:30 a.m.		**SPECIAL SESSION:** Plant Pathologists of the Future: Showcasing the Top Graduate Students from APS Division Meetings • Ballroom F, CC *(ends at 11:45 a.m.)* **TECHNICAL SESSION:** Fungal and Fungal-Like Pathogenicity • Ballroom G, CC **TECHNICAL SESSION:** Weather and Disease Models • Ballroom H, CC
LUNCH		
1:00 – 2:15 p.m.	**HOT TOPIC:** An Innovative Classroom: The Rewards of Blending a Plant Pathology Course for Non-Biology Majors • Ballroom B, CC **PHYTOVIEW:** Protecting Seed Health: More than the Eye Beholds • Ballroom C, CC **TECHNICAL SESSION:** Fungal Diversity and Population Genetics • Ballroom F, CC **TECHNICAL SESSION:** Genetic Diversity of Viruses • Ballroom G, CC	
1:00 – 4:00 p.m.	**SPECIAL SESSION:** Impact of Innovative Postharvest Practices on Trade and Food Safety • Ballroom D, CC **SPECIAL SESSION:** Participatory Plant Disease Research: Advancing Sustainable Food Production through Farmer-Researcher Partnerships • Ballroom E, CC **SPECIAL SESSION:** Schroth Faces of the Future: Nematology • Ballroom A, CC	
2:15 –3:30 p.m.		
2:45 – 4:00 p.m.	**SPECIAL SESSION:** Careers in Industry • Ballroom B, CC **TECHNICAL SESSION:** Aflatoxins • Ballroom C, CC **TECHNICAL SESSION:** Oomycete Population Structure • Ballroom F, CC **TECHNICAL SESSION:** Virus Epidemiology • Ballroom G, CC	

TUESDAY	WEDNESDAY
TECHNICAL SESSION: Bacterial Virulence in the Xylem • Ballroom F, CC **TECHNICAL SESSION:** Epidemiology and Disease Management • Ballroom G, CC	**SPECIAL SESSION:** Climate Cycles, Climate Forecasting, and Disease Cycles Spanning Multiple Years *(livestreamed)* • Ballroom E, CC **SPECIAL SESSION:**Physiological Basis and Modeling for Climate-Induced Changes in Forest Pathogens and Their Hosts • Ballroom B, CC **TECHNICAL SESSION:** Agents for Biological Control • Ballroom C, CC **TECHNICAL SESSION:** Emerging Viruses • Ballroom F, CC **TECHNICAL SESSION:** Liberibacter-Session 1 • Ballroom G, CC
SPECIAL SESSION: Emerging Downy Mildew Diseases: Where Have We Been, Where Are We Going? • Ballroom D, CC **SPECIAL SESSION:** Impact of Repeat Elements on Genome Evolution and Pathogen Biology • Ballroom A, CC **SPECIAL SESSION:** Nematology: From Microbiomes to Management *(livestreamed)* • Ballroom E, CC **SPECIAL SESSION:**New Products & Services • Ballroom B, CC **SPECIAL SESSION:** Seed Transmission of Vector-Borne Pathogens: Mysteries, Caveats, and Mechanisms • Ballroom C, CC	**SPECIAL SESSION:** Buzzing the Tower: Unmanned Aerial Vehicles (UAV)/Drones for Applications in Plant Pathology • Ballroom D, CC **SPECIAL SESSION:** Contributions from Population Genomics to Plant Pathology • Ballroom A, CC
TECHNICAL SESSION: Bacterial Pathogenicity • Ballroom F, CC **TECHNICAL SESSION:** Biological Control of Plant Diseases • Ballroom G, CC **TECHNICAL SESSION:** Impact of Cultural Management on Disease • Ballroom H, CC	**SPECIAL SESSION:**Banana Production at the Crossroads: Impact of *Fusarium oxysporum* f.sp. *cubense* TR4 *(ends at 11:45 a.m.)* *(livestreamed)* • Ballroom E, CC **TECHNICAL SESSION:** Biotrophic Virulence Discovery • Ballroom B, CC **TECHNICAL SESSION:** Cultural Management of Plant Diseases • Ballroom C, CC **TECHNICAL SESSION:** Disease Management • Ballroom F, CC **TECHNICAL SESSION:** Pathogen Detection Technologies-Session 2 • Ballroom G, CC
	TECHNICAL SESSION: Bacterial Biology and Host Interactions • Ballroom B, CC **TECHNICAL SESSION:** Etiology of Diseases Caused by Fungi and Oomycetes • Ballroom C, CC **TECHNICAL SESSION:** Fungicide Resistance-Session 2 • Ballroom F, CC **TECHNICAL SESSION:** Host-Pathogen Interactions • Ballroom G, CC
	SPECIAL SESSION: APS-CSPP Joint Symposium on Plant Pathology and Disease Control • Ballroom E, CC **SPECIAL SESSION:** Blocking the Transmission of Vector-Borne Plant Pathogens, Dream or Reality? • Ballroom D, CC **SPECIAL SESSION:** *Phytophthora tentaculata*, A Newly Introduced Nursery Pathogen and How Clean Stock Production Systems Can Limit Disease Spread • Ballroom A, CC
TECHNICAL SESSION: Fungal Pathogen Genetics and Biology • Ballroom A, CC **TECHNICAL SESSION:** Host Resistance • Ballroom F, CC **TECHNICAL SESSION:** Nematodes • Ballroom G, CC **TECHNICAL SESSION:** Virus-Host Interactions • Ballroom H, CC **PHYTOVIEW:** The Phytobiomes Initiative – Something for Everyone • Ballroom E, CC **PLENARY FOLLOW-UP SESSION**: When Generations Connect • Ballroom C, CC **SPECIAL SESSION:** Life Beyond the Plant: Bacterial Wars • Ballroom B, CC	
	TECHNICAL SESSION: Chemical Management of Plant Diseases • Ballroom B, CC **TECHNICAL SESSION:** Fungal Epidemiology • Ballroom C, CC **TECHNICAL SESSION:** Fungal Pathogens • Ballroom F, CC **TECHNICAL SESSION:** Liberibacter-Session 2 • Ballroom G, CC

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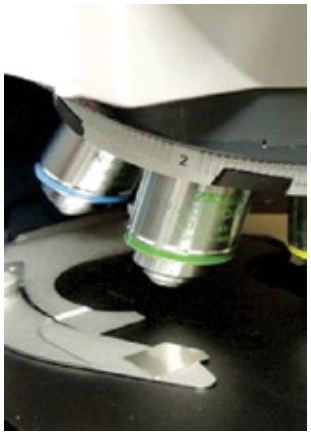

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- Microbial Activity Analysis (Average Well Color Development data)

- Diagnostic tests for virus diseases using ELISA and RT-PCR
- Seed and Plant Health Testing using NSHS, ISTA and AOSA protocols

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Daily Meeting Schedule and Sessions

Meetings take place in the Pasadena Convention Center (CC) or other locations as noted.

FRIDAY, JULY 31 – SATURDAY, AUGUST 1

7:30 a.m. Fri. – 6:00 p.m. Sat.	**Field Trip:** Southern California Agriculture	Offsite

All Field Trips and other bus departures leave from the Pasadena Convention Center, 300 East Green Street, front of building

SATURDAY, AUGUST 1

7:00 a.m. – 4:00 p.m.	**Field Trip:** Tour of Citrus Facilities Near Riverside, CA, and Their Role in Combating Huanglongbing	Offsite
7:00 a.m. – 5:00 p.m.	**Field Trip:** Ornamental Field Trip	Offsite
8:00 a.m. – 5:00 p.m.	**Workshop:** Simulation Modeling in Botanical Epidemiology and Crop Loss Analysis	Room 214, CC
8:30 a.m. – 4:30 p.m.	**Leadership Institute:** EI and IP–Core Tools for Science Leaders	Monterey, Hilton
8:30 a.m. – 5:30 p.m.	**Field Trip:** Southern California Forest Health Issues: Drought, Forest Insects, and Diseases	Offsite
9:00 a.m. – 12:00 p.m.	**Workshop:** Analysis of Population Genetic Data in R	Room 211, CC
9:30 a.m. – 4:30 p.m.	**Workshop:** Sustainability, Genetics, and Future Cultivars	Room 104, CC
10:00 – 11:15 a.m.	PMN Editorial Board Meeting, *by invitation*	San Diego, Hilton
11:30 a.m. – 1:30 p.m.	Office of International Programs (OIP) Board Meeting	Rooms 209/210, CC
11:45 a.m. – 2:30 p.m.	APS PRESS Board Meeting	San Diego, Hilton
12:00 – 6:00 p.m.	Registration	Hall AB Foyer, CC
1:00 – 4:00 p.m.	**Workshop:** Agriculture Counts: Real World Statistics USDA National Agriculture Statistics Survey (NASS)	Room 204, CC
1:00 – 5:00 p.m.	**Workshop:** GDM New ARM Software Tips and Techniques	Room 212, CC
1:00 – 5:00 p.m.	**Workshop:** Design and Analysis of RNA-seq Experiments	Room 208, CC
1:00 – 5:00 p.m.	**Workshop:** Introduction to Multivariate Statistics in R	Room 207, CC
2:45 – 5:00 p.m.	Publications Board Meeting	San Diego, Hilton
3:00 – 4:30 p.m.	Committee Chair/Vice Chair Orientation	Room 107, CC
4:00 – 6:00 p.m.	Microbial Forensics Interest Group	Room 101, CC
4:30 – 5:30 p.m.	First Timers' Orientation	Room 106, CC
5:15 – 6:30 p.m.	*PDMR* Editors' Meeting	San Diego, Hilton
6:30 – 8:00 p.m.	**Committee Meetings**	
	Biological Control Committee	Room 107, CC
	Collections and Germplasm Committee	Rooms 209/210, CC
	Early Career Professionals Committee	Room 207, CC
	Epidemiology Committee	Ballroom A, CC
	Extension Committee	Room 104, CC
	Host Resistance Committee	Room 208, CC
	Industry Committee	Room 204, CC
	Mycotoxicology Committee	Ballroom B, CC
	Regulatory Plant Pathology Committee	Ballroom C, CC
	Seed Pathology Committee	Ballroom F, CC
	Turfgrass Pathology Committee	Ballroom G, CC
	Virology Committee	Room 211, CC
8:00 – 9:30 p.m.	**Committee Meetings**	
	Bacteriology Committee	Room 107, CC
	Chemical Control Committee	Ballroom A, CC
	Crop Loss Assessment and Risk Evaluation (CLARE) Committee	Room 101, CC
	Diseases of Ornamental Plants Committee	Room 207, CC
	Evolutionary Genetics and Genomics Committee	Room 208, CC
	Graduate Student Committee	Room 104, CC
	Molecular and Cellular Phytopathology Committee	Ballroom B, CC
	Mycology Committee	Ballroom C, CC
	Nematology Committee	Ballroom F, CC
	Plant Pathogen and Disease Detection Committee	Room 211, CC
	Teaching Committee	Room 204, CC
	Vector-Pathogen Complexes Committee	Ballroom G, CC

Daily Meeting Schedule and Sessions

Meetings take place in the Pasadena Convention Center (CC) or other locations as noted.

SUNDAY, AUGUST 2

7:00 – 9:00 a.m.	APS Education Center Editorial Board Meeting	Room 204, CC
7:00 – 9:00 a.m.	Vegetable Seed Industry Breakfast, *by invitation*	Room 107, CC
7:00 a.m. – 6:00 p.m.	Registration	Hall AB Foyer, CC
8:00 – 8:30 a.m.	Moderator Orientation	Ballroom D, CC
8:00 – 9:00 a.m.	*Phytopathology* Senior Editors' Meeting	Room 102, CC
8:00 – 9:00 a.m.	*Plant Disease* Senior Editors' Meeting	Room 103, CC
8:00 – 10:00 a.m.	North America Fungicide Resistance Action Committee (FRAC)	Room 212/214, CC
8:00 a.m. – 2:00 p.m.	Exhibit Set-Up	Hall AB, CC
8:30 – 10:00 a.m.	**Committee Meetings**	
	Biotechnology Committee	Room 104, CC
	Committee for Diversity and Equality	Room 211, CC
	Diagnostics Committee	Ballroom C, CC
	Emerging Diseases and Pathogens Committee	Ballroom B, CC
	Forest Pathology Committee	Room 208, CC
	Integrated Plant Disease Management Committee	Room 101, CC
	Pathogen Resistance Committee	Ballroom F, CC
	Phyllosphere Microbiology Committee	Ballroom A, CC
	Postharvest Pathology Committee	Room 105, CC
	Soil Microbiology and Root Diseases Committee	Ballroom G, CC
	Tropical Plant Pathology Committee	Room 207, CC
9:00 – 10:00 a.m.	Leadership Institute Committee Meeting	Rooms 209/210, CC
9:00 – 10:00 a.m.	*Phytopathology* Editorial Board Meeting	Room 102, CC
9:00 – 10:00 a.m.	*Plant Disease* Editorial Board Meeting	Room 103, CC
9:00 – 10:00 a.m.	APS Foundation Award Reception, *by invitation*	Gold Room, Civic Auditorium
10:30 a.m. – 12:00 p.m.	**APS Opening General Session and Awards & Honors Ceremony**	Civic Auditorium, CC
12:00 – 1:00 p.m.	Lunch Break	
12:00 – 2:00 p.m.	Division Officers' Luncheon	Room 101, CC
12:00 – 2:00 p.m.	Poster Set-Up	Hall AB, CC
12:00 – 6:00 p.m.	APS-OIP Silent Auction	Hall AB Foyer, CC
1:00 – 2:00 p.m.	APS/APHIS Widely Prevalent Virus Committee Meeting, *by invitation*	Room 204, CC
1:00 – 2:15 p.m.	**New! Hot Topic:** An Innovative Classroom: The Rewards of Blending a Plant Pathology Course for Non-Biology Majors *(see page 25 for description)*	Ballroom B, CC
1:00 – 2:15 p.m.	**Phytoview:** Protecting Seed Health: More than the Eye Beholds *(see page 17 for description)*	Ballroom C, CC
	Technical Sessions	
1:00 – 2:15 p.m.	• Fungal Diversity and Population Genetics	Ballroom F, CC
1:00 – 2:15 p.m.	• Genetic Diversity of Viruses	Ballroom G, CC
1:00 – 3:00 p.m.	NPDN Town Hall Meeting	Room 107, CC
	Special Sessions	
1:00 – 4:00 p.m.	• Impact of Innovative Postharvest Practices on Trade and Food Safety	Ballroom D, CC
1:00 – 4:00 p.m.	• Participatory Plant Disease Research: Advancing Sustainable Food Production through Farmer-Researcher Partnerships	Ballroom E, CC
1:00 – 4:00 p.m.	• Schroth Faces of the Future: Nematology	Ballroom A, CC
1:00 – 4:30 p.m.	APS Public Policy Board (PPB) Meeting	Room 103, CC
2:30 – 3:30 p.m.	*Plant Health Progress* Editorial Board Meeting, *by invitation*	Room 204, CC
	Special Session	
2:45 – 4:00 p.m.	• Careers in Industry	Ballroom B, CC
	Technical Sessions	
2:45 – 4:00 p.m.	• Aflatoxins	Ballroom C, CC
2:45 – 4:00 p.m.	• Oomycete Population Structure	Ballroom F, CC
2:45 – 4:00 p.m.	• Virus Epidemiology	Ballroom G, CC
4:00 – 6:00 p.m.	APS PRESS Bookstore	Hall AB, CC
4:00 – 6:00 p.m.	**Welcome Reception with Exhibition and Posters**	Hall AB, CC
4:00 – 6:00 p.m.	Poster Viewing	Hall AB, CC

6:00 – 7:00 p.m.	**Alumni Networking Event** • Chesapeake Bay Tributaries • Cornell University • Iowa State University • Louisiana State University • Michigan State University • North Carolina State University • The Ohio State University • Oklahoma State University • Oregon State University • Pennsylvania State University • University of California-Davis • University of California – Riverside • University of Florida • University of Georgia • University of Illinois • University of Minnesota • University of Wisconsin	Exhibit Hall C, CC
7:00 – 10:00 p.m.	Ornamental Virus Discussion Group	Room 102, CC
8:00 – 9:30 p.m.	National Plant Disease Recovery System (NPDRS) Meeting	Room 101, CC

Returning to APS! PhytoViews

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

Protecting Seed Health: More than the Eye Beholds

Sunday, August 2, 1:00 – 2:15 p.m.; Ballroom C, Convention Center

Moderator: Lindsey du Toit, Washington State University

Panelists:

- Gary Munkvold, Iowa State University
- Samantha Thomas, Monsanto Vegetable Seeds
- TBA, USDA APHIS PPQ Seed Specialist

Join us to explore the complexity of seed pathology and seed health testing. Public and private sector seed pathologists will serve on a panel to answer questions and lead a discussion on seed testing methods, robust validation of seed health testing methods, seed certification based on standardized seed assays, testing treated vs. nontreated seeds, differentiating viable vs. nonviable seedborne inoculum, seed lab certification, thresholds for seedborne pathogens, and the impacts of current seed regulations and inspections as well as new initiatives with the seed industry to reduce the risks of seedborne pathogens associated with movement of seed.

The Phytobiomes Initiative: Something for Everyone

Tuesday, August 4, 2:15 – 3:30 p.m.; Ballroom E, Convention Center

Moderator: Kellye Eversole, Eversole Associates

Panelists:

- Melanie Lewis Ivey, Department of Plant Pathology and Crop Physiology, Louisiana State University
- Kirk Broders, Department of Biological Sciences, University of New Hampshire
- Linda Kinkel, Department of Plant Pathology, University of Minnesota

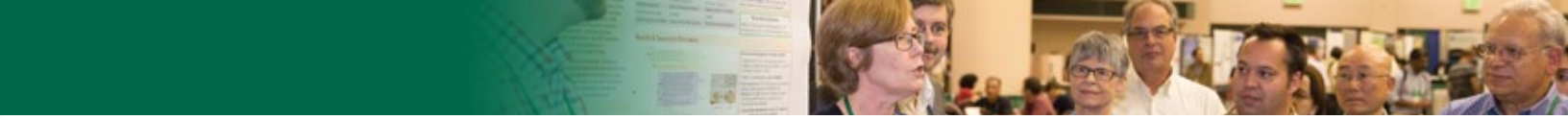
The Phytobiomes Initiative (phytobiomes.org) is a major focus of APS advocacy with government agencies through the Public Policy Board. The initiative promotes funding of research that will lead to an understanding of phytobiomes and how the information gained can be used to improve crop production, quality, and safety. Have you wondered how the Phytobiomes Initiative can help you serve your clientele better with research that directly addresses important plant health issues? Have you wondered if your science is part of the Phytobiomes Initiative? Through interactive exchange with panel members, this PhytoViews session will update participants on opportunities and explore needs for translational research with near-term applications.

Daily Meeting Schedule and Sessions

Meetings take place in the Pasadena Convention Center (CC) or other locations as noted.

MONDAY, AUGUST 3

6:30 – 8:00 a.m.	Extension Plant Pathologists' Breakfast	Room 107, CC
7:00 a.m. – 12:00 p.m.	Foundation Board Meeting, *by invitation*	Room 101, CC
7:00 a.m. – 5:30 p.m.	Registration	Hall AB Foyer, CC
7:30 a.m. – 8:00 p.m.	Poster Viewing	Hall AB, CC
	Technical Sessions	
8:30 – 9:45 a.m.	• Fungicide Resistance – Session 1	Ballroom G, CC
8:30 – 9:45 a.m.	• Pathogen Detection Technologies – Session 1	Ballroom H, CC
	Special Sessions	
8:30 – 11:30 a.m.	• 15th I. E. Melhus Graduate Student Symposium-From Local to Global: New Developments in Disease Risk Prediction and Crop Loss Assessment	Ballroom A, CC
8:30 – 11:30 a.m.	• Advances in Gene Silencing	Ballroom B, CC
8:30 – 11:30 a.m.	• Engagement in Plant Pathology: You Can't Start Too Early	Ballroom C, CC
8:30 – 11:30 a.m.	• Mycotoxins: From Production, Secretion, and Detection to Effects on Plants and Mammals	Ballroom D, CC
8:30 – 11:30 a.m.	• Phytobiome-Plant Interactions: Bridging Phytobiome Structure and Function	Ballroom E, CC
9:00 – 11:00 a.m.	Associated Organizations Meeting	Room 102, CC
10:00 a.m. – 5:00 p.m.	APS PRESS Bookstore	Hall AB, CC
10:00 a.m. – 6:00 p.m.	Exhibits Open	Hall AB, CC
	Technical Sessions	
10:15 – 11:30 a.m.	• Fungal and Fungal-Like Pathogenicity	Ballroom G, CC
10:15 – 11:30 a.m.	• Weather and Disease Models	Ballroom H, CC
	Special Session	
10:15 – 11:45 a.m.	• Plant Pathologists of the Future: Showcasing the Top Graduate Students from APS Division Meetings	Ballroom F, CC
10:30 – 11:30 a.m.	**Idea Cafés** *(see page 20 for listing of topics)*	Hall AB, CC
11:30 a.m. – 1:00 p.m.	Lunch Break	
11:30 a.m. – 1:00 p.m.	Graduate Student & Industry Lunch	Room 107, CC
11:30 a.m. – 1:00 p.m.	Past Presidents' Lunch, *by invitation*	Room 214, CC
11:30 a.m. – 1:00 p.m.	Storkan-Hanes-McCaslin Research Foundation Luncheon, *by invitation*	Room 208, CC
11:30 a.m. – 1:00 p.m.	Widely Prevalent-Plant Pathogenic Fungi Working Group	Room 204, CC
1:00 – 3:00 p.m.	**Plenary Session I – Crossroads in Science** Doug Parker – *California's Drought and Drought Response* Michael Rogers – *Crossroads in Science*	Civic Auditorium, CC
3:30 – 5:00 p.m.	Divisional Forum	Room 204, CC
3:30 – 4:00 p.m.	**Poster Huddles** *Huddle #1* – How do you determine which microbes have the best potential to become a successful biological control agent? *Huddle #2* – How do you develop a screening method to identify disease-resistant plants? *Huddle #3* – What types of research should be prioritized when new diseases are found? *Huddle #4* – How do you decide on a sampling strategy to determine the spatial distribution of a pathogen?	Hall AB, CC
4:00 – 6:00 p.m.	**Poster Viewing with Authors** *4:00 – 5:00 p.m. Posters 1 – 403 (even numbers)* *5:00 – 6:00 p.m. Posters 404 – 807 (even numbers)*	Hall AB, CC
4:30 – 6:00 p.m.	CADRE Meeting for APS Professional Development Resource	Room 101, CC
6:00 – 7:00 p.m.	Early Career Professionals' Social with Employer Networking	Room 107, CC
6:00 – 7:00 p.m.	Graduate Student Social	Room 106, CC
6:00 – 7:00 p.m.	Journals Senior Editors' Reception, *by invitation*	Room 207, CC
6:30 – 9:30 p.m.	Industry & Extension Networking Event *(see page 5 for address; walking distance, transportation is not provided)*	Offsite, Castle Green



TUESDAY, AUGUST 4

7:00 – 8:30 a.m.	Sustaining Associates' Breakfast, *by invitation*	Room 212, CC
7:00 – 9:00 a.m.	Annual Meeting Board Meeting	Room 204, CC
7:00 a.m. – 5:30 p.m.	Registration	Hall AB Foyer, CC
7:30 – 9:30 a.m.	Small Fruit Diseases Workers Discussion	Room 107, CC
7:30 a.m. – 6:00 p.m.	Poster Viewing	Hall AB, CC
8:00 a.m. – 12:00 p.m.	**Take A Walk Session:** Diseases in the Gardens and How They Are Excluded *(buses depart at front of Convention Center, promptly at 8:00 a.m.)*	Offsite, Huntington Gardens
	Technical Sessions	
8:30 – 9:45 a.m.	• Bacterial Virulence in the Xylem	Ballroom F, CC
8:30 – 9:45 a.m.	• Epidemiology and Disease Management	Ballroom G, CC
	Special Sessions	
8:30 – 11:30 a.m.	• Emerging Downy Mildew Diseases: Where Have We Been, Where Are We Going?	Ballroom D, CC
8:30 – 11:30 a.m.	• Impact of Repeat Elements on Genome Evolution and Pathogen Biology	Ballroom A, CC
8:30 – 11:30 a.m.	• Nematology: From Microbiomes to Management	Ballroom E, CC
8:30 – 11:30 a.m.	• New Products & Services	Ballroom B, CC
8:30 – 11:30 a.m.	• Seed Transmission of Vector-Borne Pathogens: Mysteries, Caveats, and Mechanisms	Ballroom C, CC
8:30 a.m. – 12:00 p.m.	Academic Unit Leaders Forum Breakfast and Meeting	Room 211, CC
10:00 a.m. – 5:00 p.m.	APS PRESS Bookstore	Hall AB, CC
10:00 a.m. – 6:00 p.m.	Exhibits Open	Hall AB, CC
	Technical Sessions	
10:15 – 11:30 a.m.	• Bacterial Pathogenicity	Ballroom F, CC
10:15 – 11:30 a.m.	• Biological Control of Plant Diseases	Ballroom G, CC
10:15 – 11:30 a.m.	• Impact of Cultural Management on Disease	Ballroom H, CC
11:30 a.m. – 1:00 p.m.	Lunch Break	
11:30 a.m. – 1:00 p.m.	*Phytopathology News* Advisory Committee Meeting	Restaurant Soleil, Sheraton
12:00 – 1:00 p.m.	APHIS Widely Prevalent Bacteria Committee Meeting, *by invitation*	Room 204, CC
12:00 – 1:00 p.m.	Orange Rust Sugarcane Meeting *(brown bag lunch)*	Room 101, CC
1:00 – 2:00 p.m.	**Plenary Session II – When Generations Connect** Scott Zimmer - *writer, market researcher, and generational expert*	Civic Auditorium, CC
2:15 – 3:00 p.m.	*APS Image Database* Demonstration	Room 107, CC
2:15 – 3:15 p.m.	**Idea Cafes** *(see page 20 for listing of topics)*	Exhibit Hall AB, CC
2:15 – 3:30 p.m.	**PhytoView:** The Phytobiome Initiative: Something for Everyone *(see page 17 for description)*	Ballroom E, CC
2:15 – 3:30 p.m.	NEW **Plenary Follow-Up Session** - When Generations Connect	Ballroom C, CC
	Technical Sessions	
2:15 – 3:30 p.m.	• Fungal Pathogen Genetics and Biology	Ballroom A, CC
2:15 – 3:30 p.m.	• Host Resistance	Ballroom F, CC
2:15 – 3:30 p.m.	• Nematodes	Ballroom G, CC
2:15 – 3:30 p.m.	• Virus-Host Interactions	Ballroom H, CC
	Special Session	
2:15 – 3:30 p.m.	• Life Beyond the Plant: Bacterial Wars	Ballroom B, CC
2:15 – 3:45 p.m.	Pacific Division Meeting	Room 211, CC
2:30 – 4:00 p.m.	Office of Education (OE) Board Meeting	Room 204, CC
2:30 – 4:00 p.m.	Office of Public Relations & Outreach (OPRO) Board Meeting	Room 209/210, CC
3:30 – 4:00 p.m.	**Poster Huddles** *Huddle #5* – What are silver nanoparticles and how do they impact biological and chemical disease control? *Huddle #6* – What are the important concepts needed for population analyses? *Huddle #7* – What are the essential factors needed to evaluate disease risk? *Huddle #8* – Where are we in finding alternatives to antibiotics for the control of bacterial plant diseases?	Hall AB, CC
3:30 – 5:00 p.m.	Presidential Meeting of Plant Pathology Organizations, *by invitation*	Room 214, CC
4:00 – 6:00 p.m.	**Poster Viewing with Authors** *4:00 – 5:00 p.m. Posters 1 – 403 (odd numbers)* *5:00 – 6:00 p.m. Posters 404 – 807 (odd numbers)*	Hall AB, CC

(continued)

TUESDAY, AUGUST 4 *(continued)*

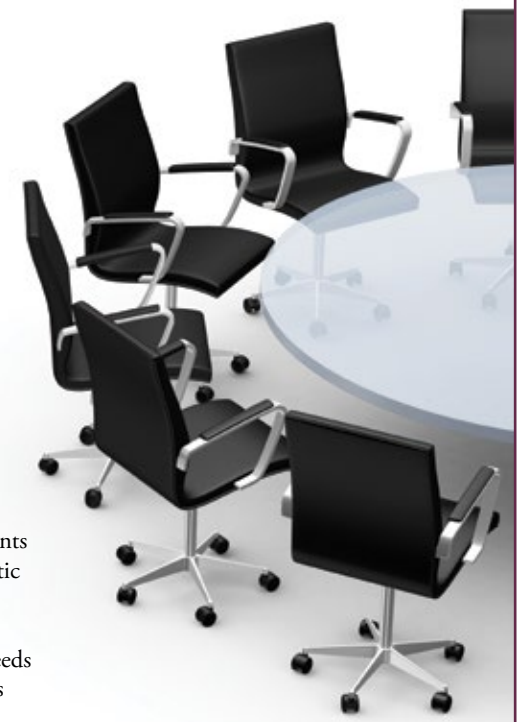
6:00 – 7:30 p.m.	Diagnostic Working Group	Room 207, CC
6:00 – 8:00 p.m.	Exhibit Take-Down	Hall AB, CC
6:00 – 8:00 p.m.	Wheat-Mite-Virus Project	Room 214, CC
6:30 – 8:30 p.m.	Committee for Diversity and Equality presents "Perception vs. Reality: Moving Your Career Forward Despite the Obstacles" Workshop *(see page 5 for address, transportation is not provided)*	Offsite, El Portal

Idea Cafés

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

Monday, August 3
10:30 – 11:30 a.m.

- Balancing a Successful Career and Family
- Effectors, Virulence, and Resistance
- Efficacy and Biological Control Agents
- Graduate School: 101 Ways to Succeed
- Liberibacter: Recent Advances and Implications
- Modeling Plant Disease Epidemics: Hourly vs. Daily Time Steps
- Phytobiome: Forest Health and Management
- Reemergence of *Xylella fastidiosa* and Global Implications



Tuesday, August 4
2:15 – 3:15 p.m.

- Emerging and Reemerging Global Plant Diseases
- Empirical and Mechanistic Models in Botanical Epidemiology
- Fungicide Resistance and Monitoring: Recent Developments
- Identification, Quantification, and Management of Parasitic Nematodes
- Interactions Affecting Cultural Disease Management
- Methods in Pathogen Detection: Advances and Future Needs
- Population Genetics and Fungal and Oomycete Pathogens

Meetings take place in the Pasadena Convention Center (CC) or other locations as noted.

WEDNESDAY, AUGUST 5

7:00 – 9:00 a.m.	Food Safety Interest Group	Room 101, CC
7:30 – 9:30 a.m.	Awards and Honors Committee Meeting, *by invitation*	Rooms 209/210, CC
7:30 a.m. – 1:00 p.m.	Registration	Hall AB Foyer, CC
8:00 – 9:30 a.m.	APS-CSPP Working Group Meeting	Room 204, CC
8:00 – 10:00 a.m.	Office of International Programs (OIP) Board Meeting	Room 103, CC
8:00 – 10:00 a.m.	Poster Take-Down	Hall AB, CC
8:00 – 11:00 a.m.	APS PRESS Bookstore	Hall AB, CC
8:00 a.m. – 12:00 p.m.	**Take A Walk Session:** Plant Diversity and Movement in Southern California *(buses depart at front of Convention Center, promptly at 8:00 a.m.)*	Offsite, Huntington Gardens
	Special Sessions	
8:30 – 9:45 a.m.	• Climate Cycles, Climate Forecasting, and Disease Cycles Spanning Multiple Years	Ballroom E, CC
8:30 – 9:45 a.m.	• Physiological Basis and Modeling for Climate-Induced Changes in Forest Pathogens and Their Hosts	Ballroom B, CC
	Technical Sessions	
8:30 – 9:45 a.m.	• Agents for Biological Control	Ballroom C, CC
8:30 – 9:45 a.m.	• Emerging Viruses	Ballroom F, CC
8:30 – 9:45 a.m.	• Liberibacter – Session 1	Ballroom G, CC
	Special Sessions	
8:30 – 11:30 a.m.	• Buzzing the Tower: Unmanned Aerial Vehicles (UAV)/ Drones for Applications in Plant Pathology	Ballroom D, CC
8:30 – 11:30 a.m.	• Contributions from Population Genomics to Plant Pathology	Ballroom A, CC
9:00 – 11:00 a.m.	Office of Public Sector Relations (OPSR) Board Meeting	Room 102, CC
9:30 – 10:30 a.m.	Financial Advisory Committee Meeting	Room 214, CC
10:00 – 11:30 a.m.	2016 Annual Meeting Program Planning Meeting	Room 211, CC
	Technical Sessions	
10:15 – 11:30 a.m.	• Biotrophic Virulence Discovery	Ballroom B, CC
10:15 – 11:30 a.m.	• Cultural Management of Plant Diseases	Ballroom C, CC
10:15 – 11:30 a.m.	• Disease Management	Ballroom F, CC
10:15 – 11:30 a.m.	• Pathogen Detection Technologies – Session 2	Ballroom G, CC
	Special Session	
10:15 – 11:45 a.m.	• Banana Production at the Crossroads: Impact of *Fusarium oxysporum* f. sp. *cubense* TR4	Ballroom E, CC
10:30 a.m. – 12:00 p.m.	APS Council Meeting	Room 214, CC
11:30 a.m. – 1:00 p.m.	Lunch Break	
12:30 – 5:00 p.m.	Journal Strategy Task Force, *by invitation*	Room 207, CC
	Technical Sessions	
1:00 – 2:15 p.m.	• Bacterial Biology and Host Interactions	Ballroom B, CC
1:00 – 2:15 p.m.	• Etiology of Diseases Caused by Fungi and Oomycetes	Ballroom C, CC
1:00 – 2:15 p.m.	• Fungicide Resistance-Session 2	Ballroom F, CC
1:00 – 2:15 p.m.	• Host-Pathogen Interactions	Ballroom G, CC
	Special Sessions	
1:00 – 4:00 p.m.	• APS-CSPP Joint Symposium on Plant Pathology and Disease Control	Ballroom E, CC
1:00 – 4:00 p.m.	• Blocking the Transmission of Vector-Borne Plant Pathogens, Dream or Reality?	Ballroom D, CC
1:00 – 4:00 p.m.	• *Phytophthora tentaculata*, A Newly Introduced Nursery Pathogen and How Clean Stock Production Systems Can Limit Disease Spread	Ballroom A, CC
	Technical Sessions	
2:45 – 4:00 p.m.	• Chemical Management of Plant Diseases	Ballroom B, CC
2:45 – 4:00 p.m.	• Fungal Epidemiology	Ballroom C, CC
2:45 – 4:00 p.m.	• Fungal Pathogens	Ballroom F, CC
2:45 – 4:00 p.m.	• Liberibacter – Session 2	Ballroom G, CC
6:00 – 9:00 p.m.	**Final Night Celebration-California Dreamin'**	Outdoor Area, Civic Auditorium

FRIDAY, JULY 31 – SATURDAY, AUGUST 1, 2015

Field Trips

Listed in chronological order.

Friday, July 31 – Saturday, August 1

Southern California Agriculture (Two Days)

Depart Friday, 7:30 a.m.; return Saturday, 6:00 p.m.

Organizers: Jim Adaskaveg, UC Riverside, Riverside, CA, U.S.A.; Gerald Holmes, Cal Poly, San Luis Obispo, CA, U.S.A.; Chang-Lin Xiao, USDA-ARS, Parlier, CA, U.S.A.

Sponsoring Committees/Sponsors: Postharvest Pathology, Small Fruit Working Group

Financial Sponsors: Arysta LifeScience, BASF Corporation, Bayer CropScience, Dow AgroSciences, JBT Corporation, Syngenta

This two-day Southern California Agriculture tour will include a stop at NASA's Jet Propulsion Laboratory for a private tour to discuss the search for life on other planets and to discuss potential diseases of plants grown in long-term colonies of the moon, Mars, and space stations. The tour will continue with visits to citrus and avocado orchards and packinghouses, vineyards, and wineries, as well as small fruit farms including strawberries, blueberries, raspberries, and blackberries. The tour concludes with a visit to the world-famous pier and boardwalk in historic Santa Barbara before returning to Pasadena, CA.

Saturday, August 1

Citrus Facilities Near Riverside, California, and Their Role in Combating Huanglongbing

7:00 a.m. – 4:00 p.m.

Organizers: Richard Lee, USDA-ARS-NCGRCD, Riverside, CA, U.S.A.; Manjunath Keremane, USDA-ARS-NCGRCD, Riverside, CA, U.S.A.; Anne Whitefield, Kansas State University, Manhattan, KS, U.S.A.

Sponsoring Committee/Sponsor: Vector-Pathogen Complexes

This is a full-day field trip to the Riverside area to look at citrus facilities and learn of efforts in California to combat Asian citrus psyllid (ACP) and huanglongbing. The field trip will provide an overview of the area-wide management districts, use of biological control for ACP, efforts to produce clean plants, and a tour of the Citrus Research Board diagnostic lab.

Ornamental

7:00 a.m. – 5:00 p.m.

Organizers: Ann Chase, Chase Agricultural Consulting LLC, Cottonwood, AZ, U.S.A.; Jan Hall, Target Specialty Products, CA, U.S.A.

Financial Sponsors: BASF Corporation, Chase Agriculture Consulting LLC

Participants will visit two local nurseries to learn about nursery operations, IPM practices, and diseases of concern and also includes a visit to Cal Poly Pomona Plant Science Department, which has a comprehensive farming operation with fruits, field crops, animal agriculture, research greenhouses, and a hydroponic production unit. Participants will end the day with a visit to Huntington Gardens.

Southern California Forest Health Issues: Drought, Forest Insects, and Diseases

8:30 a.m. – 5:30 p.m.

Organizers: Isabel Munck, USFS, Portsmouth, NH, U.S.A.; Jane Stewart, University of Georgia, Athens, GA, U.S.A.; Akif Eskalen, University of California, Riverside, CA, U.S.A.; Susan Frankel, USDA FS Pacific Southwest Research Station, Albany, CA, U.S.A.; Melody Lardner, Forest Service, U.S.A.

Sponsoring Committee/Sponsors: Forest Pathology; USDA Forest Service, Pacific Southwest Research Station

Southern California provides opportunities to view plants under stress from drought, urban encroachment, and invasive pests. We will visit an arboretum and garden infested with the polyphagous shot hole borer and *Fusarium* and then head to other nearby open areas to view other native and exotic insects and pathogens of various native and landscape trees and shrubs.

Workshops

(listed in chronological order)

Saturday, August 1

Simulation Modeling in Botanical Epidemiology and Crop Loss Analysis

8:00 a.m. – 5:00 p.m.; *Room 214, Convention Center*

Organizers: Laetitia Willocquet and Serge Savary, INRA, France

Sponsoring Committee/Sponsor: Epidemiology

Simulation modeling is a powerful approach to synthesize and integrate quantitative knowledge. It allows identifying key processes governing dynamic systems and exploring "futures" through scenario analyses. This workshop introduces basic concepts of systems analysis and simulation modeling. It then focuses on plant disease epidemics and crop yield losses. Simulation models will be used to explore model structures, their behavior, and the effect of key parameters on system dynamics.

Analysis of Population Genetic Data in R

9:00 a.m. – 12:00 p.m.; *Room 211, Convention Center*

Organizers: Niklaus Grunwald and Zhian Kamvar, USDA-ARS, Corvallis, OR, U.S.A.

Sponsoring Committees/Sponsors: Evolutionary Genetics and Genomics, Epidemiology

Analysis of population genetic data remains challenging. This workshop will focus on the kinds of analyses typically conducted by plant pathologists. It will cover analyses of data from haploid and diploid populations with dominant or codominant marker systems applicable to a range of molecular genotyping techniques. Participants will gain hands-on experience with analysis in R using datasets provided by instructors.

Sustainability, Genetics, and Future Cultivars

9:30 a.m. – 4:30 p.m.; *Room 104, Convention Center*

Organizer: Anne Bridges, AACC International, St. Paul, MN, U.S.A.

Sponsoring Committees/Sponsors: Professionalism/Outreach, Professional Development

Financial Sponsor: Monsanto Company

Join us for a discussion of new technologies and the future food supply. Talk about the latest in food and feed crops and benefits across the entire supply chain. This workshop includes an overview of current plant breeding technologies, new crops and potential food and feed benefits, challenges of yield increases, emerging plant diseases, changes in crops and ingredients, managing new molecular traits in the supply chain, and new approaches in molecular detection technologies to manage authentication in the supply chain. We will also discuss insights to critique popular press and the Internet.

Agriculture Counts: Real World Statistics USDA National Agricultural Statistics Survey (NASS)

1:00 – 4:00 p.m.; *Room 204, Convention Center*

Organizer: Beth Carroll, Retired, Greensboro, NC, U.S.A.

Sponsoring Committees/Sponsors: Public Policy Board,

This workshop provides an opportunity for hands-on experience on how to utilize the extensive USDA National Agricultural Statistics Survey (NASS) databases.

Design and Analysis of RNA-seq Experiments

1:00 – 5:00 p.m.; *Room 208, Convention Center*

Organizer: Li-Jun Ma, University of Massachusetts, Boston, MA, U.S.A.

Sponsoring Committee/Sponsor: Evolutionary Genetics and Genomics

The continuing advance of sequencing technology enables application of RNA-seq in functional studies in almost all aspects of phytopathology. This workshop will help researchers identify potentially confounding sources of variability in differential expression experiments and consider how to improve the focus of their research on their question of interest. After an overview of experimental design, attendees will have the opportunity for hands-on data analysis using the Tuxedo package.

Introduction to Multivariate Statistics in R

1:00 – 5:00 p.m.; *Room 207, Convention Center*

Organizers: Neil McRoberts, University of California-Davis, Davis, CA, U.S.A.; Paul Esker, University de Costa Rica, San Jose, Costa Rica

Sponsoring Committee/Sponsor: Epidemiology

The aim of this workshop is to introduce new users to several useful multivariate analysis methods available in the R statistical computing language. Science is full of such data sets and there are many statistical techniques available for exploring them and teasing out the useful information they contain. The workshop will introduce some of the more commonly used techniques and will focus on application rather than background theory. Some prior experience of R will be useful but not necessary.

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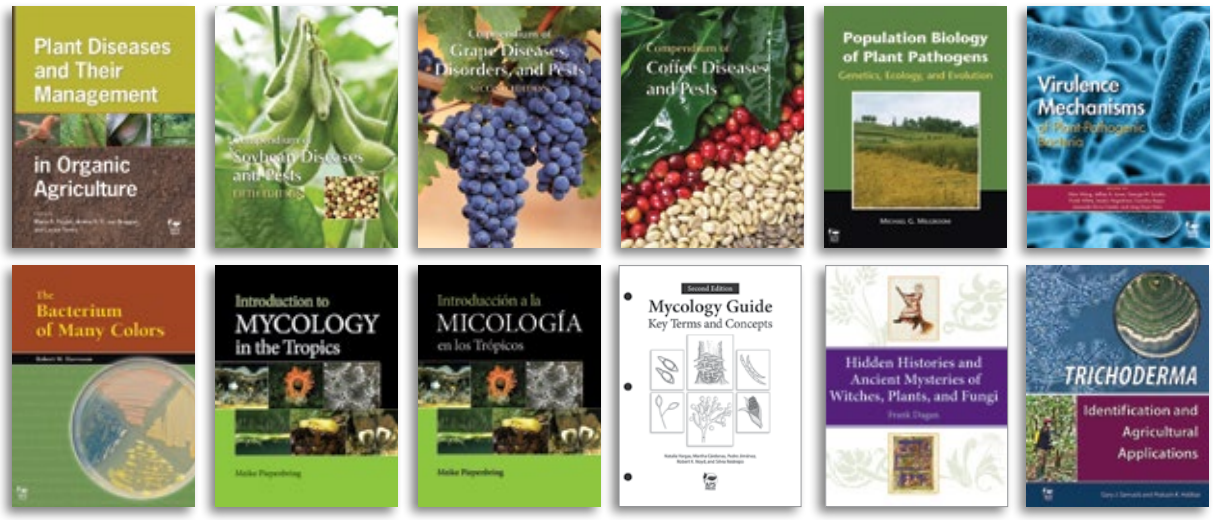

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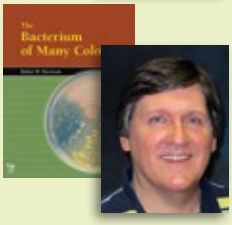
Tuesday, August 4 at 12:15–1:00 p.m. in the APS PRESS Bookstore

Ariena van Bruggen
Editor, *Plant Diseases and Their Management in Organic Agriculture*

Bob M. Harveson
Author, *The Bacterium of Many Colors*



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PUBS1

SUNDAY AFTERNOON, AUGUST 2

Hot Topic listed first followed by Special Sessions, followed by Oral Technical Sessions. Listed alphabetical by session title.
Find complete details on the meeting website www.apsnet.org/MEETINGS/ANNUAL/SCIPROGRAM/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.
Meeting room key: CC = Convention Center

Hot Topic

An Innovative Classroom: The Rewards of Blending a Plant Pathology Course for Non-Biology Majors
1:00 – 2:15 p.m.; Ballroom B, CC
Organizers/Presenters: Aurélie Rakotondrafara and Maya Hayslett, Department of Plant Pathology, University of Wisconsin-Madison, WI, U.S.A.
Tired of the same old lecture format? Looking for a more interactive and active learning classroom environment? Try blending your course! Hear about the successful case of our large plant pathology course "PP123: Plants, Parasites and People" for non-biology majors. Learn how we made student learning more personal, more engaging and more collaborative, making the class more rewarding for both students and instructors.
In our blended learning format, students learn core biological concepts online at their own time and pace. The face-to-face time is no longer about lecturing but expanding, analyzing and applying the learned concepts to historical and current cases. This class format gives unique opportunities for the students to think critically and connect their acquired knowledge in the real world. In this session you will hear about the tools, tips and tricks on how to successfully blend.

Special Sessions

Impact of Innovative Postharvest Practices on Trade and Food Safety
1:00 p.m. - 4:00 p.m.; Ballroom D, CC
Organizers: Richard Kim, Pace International, Wapato, WA, U.S.A.; Kari Peter, Penn State University, Biglerville, PA, U.S.A.
Moderators: Kari Peter, Penn State University, Biglerville, PA, U.S.A.; Richard Kim, Pace International, Wapato, WA, U.S.A.
Section: Disease Control and Pest Management
Sponsoring Committees/Sponsors: Postharvest Pathology; Chemical Control; Food Safety Interest Group
Financial Sponsor: Postharvest Committee

1:00 p.m. • 1-S
Risk management strategies for microbial food safety in apples. K. KILLINGER (1). (1) Washington State University – University of Idaho School of Food Science, Pullman, WA, U.S.A.

1:30 p.m. • 2-S
Systems approach-based mitigation of postharvest diseases to overcome trade barriers for Washington apples. C. L. XIAO (1). (1) USDA-ARS, SJVASC, Parlier, CA, U.S.A.

2:00 p.m. • 3-S
Thermofogging—Innovative technology to control fruit decays without potential food safety concerns. Y. K. KIM (1). (1) Pace International, Wapato, WA, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 4-S
New biopesticide and exempt-from-tolerance postharvest treatments to manage fruit decays in the United States. J. E. ADASKAVEG (1), H. Forster (1). (1) University of California, Riverside, CA, U.S.A.

3:15 p.m. • 5-S
Postharvest processing technologies to improve food safety and quality. B. A. NIEMIRA (1). (1) USDA-ARS Eastern Regional Research Center, Wyndmoor, PA, U.S.A.

3:45 p.m. • Discussion

Participatory Plant Disease Research: Advancing Sustainable Food Production Through Farmer-Researcher Partnerships
1:00 p.m. - 4:00 p.m.; Ballroom E, CC
Organizer/Moderator: Ruth Genger, University of Wisconsin, Madison, WI, U.S.A.
Section: Professionalism/Outreach
Sponsoring Committees/Sponsors: Diversity and Equality; Tropical Plant Pathology; Graduate Student

1:00 p.m. • 6-S
Participatory sweetpotato breeding and germplasm evaluation for resistance to viral and fungal diseases. R. O. MWANGA (1), R. W. Gibson (2), G. N. Ssemakula (3), C. G. Yencho (4). (1) International Potato Center, Kampala, Uganda; (2) Natural Resources Institute, Kent, United Kingdom; (3) National Agricultural Research Organization (NARO), Kampala, Uganda; (4) North Carolina State University, Raleigh, NC, U.S.A.

1:30 p.m. • 7-S
Participatory research with tree crop farmers in the Pacific. D. I. GUEST (1), R. Daniel (1). (1) The University of Sydney, Eveleigh, Australia

2:00 p.m. • 8-S
Participatory plant breeding and the effects of on-farm conservation and selection on diversity and adaptation. J. DAWSON (1). (1) University of Wisconsin-Madison, Madison, WI, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 9-S
A framework for optimizing participatory research. K. GARRETT (1). (1) University of Florida, Gainesville, FL, U.S.A.

3:15 p.m. • 10-S
Improving the health and productivity of organic potato crops through participatory research. R. K. GENGER (1), D. I. Rouse (1), R. Groves (1), A. O. Charkowski (1). (1) University of Wisconsin-Madison, Madison, WI, U.S.A.

3:45 p.m. • Discussion

(continued)

Schroth Faces of the Future: Nematology
1:00 p.m. - 3:45 p.m.; Ballroom A, CC

Organizers: Kimberly Cochran, University of Arkansas, Fayetteville, AR, U.S.A.; Patti Hosack, University of Missouri, Columbia, MO, U.S.A.; Martha Malapi-Wight, USDA-ARS, Beltsville, MD, U.S.A.
Moderators: Kimberly Cochran, University of Arkansas, Fayetteville, AR, U.S.A.; Patti Hosack, University of Missouri, Columbia, MO, U.S.A.
Section: Professionalism/Outreach
Sponsoring Committee/Sponsor: Early Career Professionals

1:00 p.m. • 11-S
Nematode management without methyl bromide in California grape production. J. A. CABRERA (1). (1) Bayer CropScience, Fresno, CA, U.S.A.

1:30 p.m. • 12-S
Exploration of nematode-secreted CLE Effectors for developing tools to accelerate nematode resistance breeding in crop plants. S. CHEN (1), X. Wang (2). (1) Plant Pathology and Plant-Microbe Biology Section, School of Integrative Plant Science, Cornell University, Ithaca, NY, U.S.A.; (2) USDA-ARS, Robert W. Holley Center for Agriculture and Health, Ithaca, NY, U.S.A.

2:00 p.m. • 13-S
Assessment of Fluopyram in the management of nematodes in soybean and cotton. T. R. FASKE (1). (1) Univ of Arkansas, Lonoke, AR, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 14-S
Exploiting the host cell cycle machinery to control the root-knot nematode feeding site development. P. VIEIRA (1). (1) Dept. of Plant Pathology, Physiology, and Weed Science, Virginia Tech and Floral and Nursery Plants Research Unit, USDA, Beltsville, MD, U.S.A.

3:15 p.m. • Discussion

Careers in Industry
2:45 p.m. - 4:00 p.m.; Ballroom B, CC

Organizer: Rubella Goswami, Dupont Crop Protection, Newark, DE, U.S.A.
Moderators: Rubella Goswami, Dupont Crop Protection, Newark, DE, U.S.A.; Dair McDuffee, Valent USA Corporation, Indianapolis, IN, U.S.A.
Section: Professionalism/Outreach
Sponsoring Committees/Sponsors: Industry; Early Career Professionals; Diversity and Equality

2:45 p.m. • 15-S
Exploring some of the myths of working in industry. P. J. KUHN (1). (1) Syngenta Crop Protection, Greensboro, NC, U.S.A.

3:00 p.m. • 16-S
Plant pathology career opportunities in the seed industry. S. A. ROSENBERGER (1). (1) Monsanto, Woodland, CA, U.S.A.

3:15 p.m. • 17-S
A plant pathologist's role in the discovery and development of disease control products. R. BOUNDS (1). (1) Syngenta Crop Protection, Visalia, CA, U.S.A.

3:30 p.m. • 18-S
The role of private practitioners in providing research or support for industry. C. M. BECKER (1). (1) BAAR Scientific LLC, Romulus, NY, U.S.A.

3:45 p.m. • Discussion

1:00 p.m. Techical Sessions

Fungal Diversity and Population Genetics
1:00 p.m. - 2:15 p.m.; Ballroom F, CC

Moderators: Jeffrey Rollins, University of Florida, Gainesville, FL, U.S.A.; Jane Stewart, University of Georgia, Athens, GA, U.S.A.

1:00 p.m. • 1-O
Population genetic analyses of *Fusarium virguliforme* reveal the population structure of *F. virguliforme* isolates from North and South America. J. WANG (1), J. L. Jacobs (1), M. I. Chilvers (1). (1) Michigan State University, East Lansing, MI, U.S.A.

1:15 p.m. • 2-O
Extreme genetic diversity in populations of *Exobasidium maculosum* , an emerging blueberry pathogen. J. STEWART (1), T. Glenn (2), M. T. Brewer (3). (1) Dept of Plant Pathology, University of Georgia, Athens, GA, U.S.A.; (2) Environmental Health Science, University of Georgia, Athens, GA, U.S.A.; (3) Dept. of Plant Pathology, University of Georgia, Athens, GA, U.S.A.

1:30 p.m. • 3-O
Population Diversity of *Gaeumannomyces graminis* var. *graminis* from St. Augustinegrass in Texas. M. Zidek (1), Y. K. JO (1). (1) Texas A&M University, College Station, TX, U.S.A.

1:45 p.m. • 4-O
A population analysis of *Puccinia emaculata* using single spores in Oklahoma and Virginia. J. C. PAVLU (1), G. Orquera (2), O. Arias (3), A. Moya (4), S. M. Marek (5), C. Garzón (5). (1) Oklahoma State University, Perkins, OK, U.S.A.; (2) Oklahoma State University, Stillwater , OK, U.S.A.; (3) Escuela Politécnica del Ejército, Sangolquí, Ecuador; (4) PUCE - Pontificia Universidad Católica del Ecuador, Quito, Ecuador; (5) Oklahoma State University, Stillwater, OK, U.S.A.

2:00 p.m. • 5-O
Lonely peninsula: the mating-type and population of *Phyllosticta citricarpa* in Florida. K. ZHANG (1), N. Y. Wang (2), M. M. Dewdney (2), . A. Rollins (1). (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, Lake Alfred, FL, U.S.A.

Genetic Diversity of Viruses
1:00 p.m. - 2:15 p.m.; Ballroom G, CC

Moderators: Basavaraj Bagewadi, Washington State University, Prosser, WA, U.S.A.; Scott Adkins, USDA ARS USHRL, Fort Pierce, FL, U.S.A.

1:00 p.m. • 6-O
A novel strain of *Potato virus Y* from tomato. M. CHIKH-ALI (1), D. Vander Pol (1), O. V. Nikolaeva (1), M. J. Melzer (2), A. V. Karasev (3). (1) University of Idaho, Moscow, ID, U.S.A.; (2) University of Hawaii, Honolulu, HI, U.S.A.; (3) Univ of Idaho, Moscow, ID, U.S.A.

1:15 p.m. • 7-O
Survey of virus diseases of taro, *Colocasia esculenta*, in American Samoa. N. ATIBALENTJA (1), E. M. Ilaoa (1), S. T. Fiafia (1), I. B. Gurr (1). (1) American Samoa Community College, Division of Community and Natural Resources, Pago Pago, U.S.A.

1:30 p.m. • 8-O
Sequence analysis of *Grapevine leafroll-associated virus 1* from Washington vineyards. B. DONDA (1), N. Rayapati (1). (1) Washington State University, Prosser, WA, U.S.A.

1:45 p.m. • 9-O
Coat protein gene diversity of *Papaya ringspot virus* in Puerto Rico. C. ZAMBRANA-ECHEVARRIA (1), L. De Jesus-Kim (1), R. G. Marquez-Karry (1), D. A. Jenkins (2), D. Siritunga (1). (1)

University of Puerto Rico, Mayaguez campus, Mayaguez, U.S.A.; (2) Tropical Agriculture Research Station, USDA-ARS, Mayaguez, U.S.A.

2:00 p.m. • 10-O
Variability of *Watermelon mosaic virus* isolates collected from cucurbits in Southern United States. A. ALI (1). (1) Univ of Tulsa, Tulsa, OK, U.S.A.

2:45 p.m. Technical Sessions

Aflatoxins
2:45 p.m. - 4:00 p.m.; Ballroom C, CC
Moderators: Josielle Rezende, Louisiana State University, Baton Rouge, LA, U.S.A.; Peter Cotty, USDA ARS, Tucson, AZ, U.S.A.

2:45 p.m. • 11-O
Variable aflatoxin production in 48-well plates: evidence for aflatoxin stimulatory and inhibitory volatile-chemicals produced by *Aspergillus flavus.* R. R. SWEANY (1), K. E. Damann (1). (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.

3:00 p.m. • 12-O
Predisposition of maize and groundnut to aflatoxin contamination in Zambia. P. KACHAPULULA (1), R. Bandyopadhyay (2), J. Akello (3), M. Mukanga (4), P. J. Cotty (5). (1) Univ of Arizona, Tucson, AZ, U.S.A.; (2) International Institute of Tropical Agriculture, Ibadan, Nigeria; (3) International Institute of Tropical Agriculture, Lusaka, Zambia; (4) Zambia Agriculture Research Institute, Lusaka, Zambia; (5) University of Arizona, Tucson, AZ, U.S.A.

3:15 p.m. • 13-O
The fate of aflatoxins associated with contaminated crops in soil. L. R. L. ARONE (1), R. Jaime (2), R. Ranajit Bandyopadhyay (3), P. J. Cotty (4). (1) University of Arizona, Tucson, AZ, U.S.A.; (2) School of Plant Sciences, University of Arizona, Tucson, AZ, U.S.A.; (3) International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria; (4) Agricultural Research Service, USDA / School of Plant Sciences, University of Arizona, Tucson, AZ, U.S.A.

3:30 p.m. • 14-O
Genetic diversity of L-strain isolates of *Aspergillus flavus* of potential use for aflatoxin biocontrol in sub-Saharan Africa. M. S. ISLAM (1), K. A. Callicott (1), J. Atehnkeng (2), J. Augusto (3), S. Bonkoungou (4), D. Agbetiameh (5), P. M. Diedhiou (6), H. Daudi (7), M. Mukanga (8), R. Bandyopadhyay (2), P. J. Cotty (1). (1) USDA ARS, School of Plant Sciences, The University of Arizona, Tucson, AZ, U.S.A.; (2) International Institute of Tropical Agriculture, Ibadan, Nigeria; (3) International Institute of Tropical Agriculture-Mozambique, Nampula, Mozambique; (4) Institut de l'Environnement et de Recherches Agricoles (INERA),, Farako Ba, Burkina faso; (5) Kwame Nkrumah University of Science and Technology, Kumasi, Ghana; (6) Université Gaston Berger, Saint-Louis, Senegal; (7) Agriculture Research Institute, Naliendele, Tanzania; (8) Zambia Agricultural Research Institute, Mount Makulu , Zambia

3:45 p.m. • 15-O
Influences of temperature and host on atoxigenic *Aspergillus flavus* isolates. P. FALKENBERG (1), P. J. Cotty (1). (1) United States Department of Agriculture - ARS, Tucson, AZ, U.S.A.

Oomycete Population Structure
2:45 p.m. - 4:00 p.m.; Ballroom F, CC
Moderators: Gabriel Schierman, University of Hawaii At Manoa, Honolulu, HI, U.S.A.; Denita Hadziabdic-Guerry, University of Tennessee, Knoxville, TN, U.S.A.

2:45 p.m. • 16-O
Evidence for at least two introductions of the sudden oak death pathogen into Oregon forests. Z. N. KAMVAR (1), M. M. Larsen (2), A. M. Kanaskie (3), E. M. Hansen (1), N. J. Grünwald (2). (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA ARS HCRL, Corvallis, OR, U.S.A.; (3) Oregon Department of Forestry, Salem, OR, U.S.A.

3:00 p.m. • 17-O
Genomic signatures of host jumping onto raspberry and strawberry in two *Phytophthora* sister taxa. J. F. TABIMA (1), D. Shen (2), B. Kronmiller (1), B. J. Knaus (3), C. M. Press (3), I. A. Zasada (1), B. M. Tyler (1), N. J. Grünwald (3). (1) Oregon State University, Corvallis, OR, U.S.A.; (2) Nanjing Agricultural University, Nanjing, Chile; (3) USDA ARS, Corvallis, OR, U.S.A.

3:15 p.m. • 18-O
Population Genomics of an Overwintering Bi-Parental *Phytophthora capsici* population. M. O. CARLSON (1), C. D. Smart (1). (1) Cornell University NYSAES, Geneva, NY, U.S.A.

3:30 p.m. • 19-O
Spatiotemporal population structure of *Pseudoperonospora cubensis* isolates in Michigan and Ontario, Canada. R. NAEGELE (1), L. M. Quesada-Ocampo (2), J. Kurjan (3), C. Saude (4), M. K. Hausbeck (3). (1) Michigan State Univ, East Lansing, MI, U.S.A.; (2) North Carolina State University, Raleigh, NC, U.S.A.; (3) Michigan State University, East Lansing, MI, U.S.A.; (4) Canadian Tobacco Research Foundation, Tillonsburg, ON, Canada

3:45 p.m. • 20-O
Population structure of *Pythium ultimum* from greenhouse floral crops in Michigan. J. Del Castillo Munera (1), L. Quesada-Ocampo (2), A. Rojas (3), M. Chilvers (3), M. K. Hausbeck (3), J. DEL CASTILLO MÚNERA (3). (1) Michigan State Univ, East Lansing, MI, U.S.A.; (2) North Carolina State University, Raleigh, NC, U.S.A.; (3) Michigan State University, East Lansing, MI, U.S.A.

Virus Epidemiology
2:45 p.m. - 4:00 p.m.; Ballroom G, CC
Moderators: Sara Thomas-Sharma, University of Wisconsin, Madison, WI, U.S.A.; Bethany Grabow, Kansas State University, Manhattan, KS, U.S.A.

2:45 p.m. • 21-O
Discovery of a novel Grapevine vein clearing virus isolate in wild *Vitis rupestris* vine. M. KOVENS (1), L. Hubbert (1), S. Honesty (1), Q. Guo (1), D. Pap (1), R. Dai (1), L. Kovacs (1), W. Qiu (1). (1) Missouri State University, Springfield, MO, U.S.A.

3:00 p.m. • 22-O
Identification of *Brevipalpus yothersi* Baker, as vector and possible primary host of cytoplasmic citrus leprosis viruses. A. ROY (1), J. S. Hartung (2), J. Shao (2), G. Leon (3), M. J. Melzer (4), J. J. Beard (5), G. Otero-Colina (6), G. R. Bauchan (2), R. Ochoa (2), R. H. Brlansky (7), W. L. Schneider (1). (1) USDA-ARS, Frederick, MD, U.S.A.; (2) USDA-ARS, Beltsville, MD, U.S.A.; (3) Centro de Investigación La Libertad, CORPOICA, Villavicencio, Colombia; (4) University of Hawaii, Honolulu, HI, U.S.A.; (5) Queensland Museum, South Brisbane, Australia; (6) Colegio de Postgraduados, Campus Montecillo, Texcoco, Mexico; (7) Univ of Florida, Lake Alfred, FL, U.S.A.

(continued)

3:15 p.m. • 23-O
Molecular epidemiology of cassava mosaic geminiviruses in Zambia. R. M. MULENGA (1), J. Ndunguru (2), P. C. Chikoti (1), D. W. Miano (3), J. P. Legg (4), O. J. Alabi (5). (1) Zambia Agriculture Research Institute, Mount Makulu Central Research Station, Chilanga, Lusaka, Zambia; (2) Mikocheni Agricultural Research Institute, Dar-Es-Salaam, Tanzania; (3) University of Nairobi, College of Agriculture and Veterinary Sciences, Department of Plant Sciences and Crop Protection, Kangemi, Nairobi, Kenya; (4) International Institute of Tropical Agriculture, Dar es Salaam, Tanzania; (5) Department of Plant Pathology & Microbiology, Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.

3:30 p.m. • 24-O
Association of Grapevine rupestris stem pitting-associated virus in declining Cabernet Sauvignon grapevines grafted on Schwarzmann in California. T. L. LAWLER (1), A. Rowhani (1), J. K. Uyemoto (2), M. R. Sudarshana (2). (1) UC Davis, Davis, CA, U.S.A.; (2) USDA-ARS, Davis, CA, U.S.A.

3:45 p.m. • 25-O
Assessing the benefits of disease management by interpreting an ecological survey of grapevine viruses when contrasted with "planting booms". K. ARNOLD (1), D. Golino (1), M. Cooper (2), R. Smith (3), V. Klaassen (4), N. McRoberts (1). (1) University of California-Davis. Department of Plant Pathology, Davis, CA, U.S.A.; (2) University of California Cooperative Extension, Napa, CA, U.S.A.; (3) University of California Cooperative Extension, Santa Rosa, CA, U.S.A.; (4) University of California-Davis. Foundation Plant Services, Davis, CA, U.S.A.

MONDAY MORNING, AUGUST 3

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/SCIPROGRAM/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.
Meeting room key: CC = Convention Center

Special Sessions

15th I. E. Melhus Graduate Student Symposium - From Local to Global: New Developments in Disease Risk Prediction and Crop Loss Assessment

8:30 a.m. - 11:30 a.m.; Ballroom A, CC
Organizers/ Moderators: Clive Bock, USDA ARS SEFTNRL, Byron, GA, U.S.A.; Peter Ojiambo, North Carolina State University, Raleigh, NC, U.S.A.; Kelsey Andersen, Monsanto Company, Creve Coeur, MO. U.S.A.
Section: Professionalism/Outreach
Sponsoring Committees/Sponsors: Crop Loss Assessment and Risk Evaluation (CLARE) Committee
Financial Sponsors: Monsanto Company, APS Foundation, Crop Loss Assessment and Risk Evaluation (CLARE) Committee

8:30 a.m. • 19-S
Understanding antibiotic resistance in *Erwinia amylovora*: impacts on disease management and epiphytic bacterial populations in apple orchards. K. A. BEKOSCKE (1), K. D. Cox (1). (1) Cornell University, Geneva, NY, U.S.A.

9:00 a.m. • 20-S
Epidemiology and control of spinach downy mildew in coastal California. R. A. CHOUDHURY (1), S. T. Koike (2), A. Fox (3), K. V. Subbarao (4), S. J. Klosterman (5), N. McRoberts (6). (1) Univ of California, Davis, CA, U.S.A.; (2) Cooperative Extension Monterey County, Salinas, CA, U.S.A.; (3) Fox Weather, LLC, Fortuna, CA, U.S.A.; (4) UC Davis, Davis, CA, U.S.A.; (5) USDA ARS, Salinas, CA, U.S.A.; (6) Plant Pathology Department, University of California, Davis, CA, U.S.A.

9:30 a.m. • 21-S
A three-pronged approach to late blight management: Host resistance, diagnostics, and understanding pathogen diversity. Z. R. HANSEN (1), C. D. Smart (2). (1) Cornell University, Ithaca, NY, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 22-S
Epidemiological concepts and methods to predict the effects of plant morphology and partial resistance components on sunflower black stem epidemics. A. A. SCHWANCK (1), S. Savary (1), L. Willocquet (1). (1) Inst National de la Recherche Agronomique, Toulouse, France

10:45 a.m. • 23-S
Characterization and distribution of fungi associated with needle defoliation of eastern white pine (*Pinus strobus*). S. A. WYKA (1), K. D. Broders (2), I. Munck (3). (1) University of New Hampshire, Dover, NH, U.S.A.; (2) University of New Hampshire, Durham, NH, U.S.A.; (3) USDA Forest Service, Durham, NH, U.S.A.

11:15 a.m. • Discussion

Advances in Gene Silencing

8:30 a.m. - 11:30 a.m.; Ballroom B, CC
Organizers/Moderators: Bhanu Priya Donda and Naidu Rayapati, Washington State University, Prosser, WA, U.S.A.
Section: Biology of Pathogens
Sponsoring Committee/Sponsor: Virology
Financial Sponsors: Virology Committee, The Samuel Roberts Noble Foundation

8:30 a.m. • 24-S
Antiviral silencing in plants and animals. S. W. DING (1). (1) University of California, Riverside, CA, U.S.A.

9:00 a.m. • 25-S
Tomato bushy stunt virus as a model system to study antiviral RNA silencing. H. B. SCHOLTHOF (1). (1) Texas A&M University, College Station, TX, U.S.A.

9:30 a.m. • 26-S
Diverse silencing suppressors and RNAi interactions among members of the Closteroviridae. B. FALK (1), W. Qiao (2), C. Rosa (3). (1) Departmetnt of Plant Pathology, University of California, Davis, CA, U.S.A.; (2) Department of Plant Pathology, Univ. of California, Davis, CA, U.S.A.; (3) Department of Plant Pathology, Pennsylvania State University, University Park, PA, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 27-S
A reexamination of the relationship between RNA silencing and cross protection. X. Zhang (1), F. QU (1). (1) The Ohio State University, Wooster, OH, U.S.A.

10:45 a.m. • 28-S
A novel chemopreventive strategy using tumor suppressor microRNAs produced in edible plants. V. VANCE (1), S. Mlotshwa (1), G. J. Pruss (1), J. L. MacArthur (1), C. Davis (1), L. Hofseth (1), M. M. Pena (1). (1) University of South Carolina, Columbia, SC, U.S.A.

11:15 a.m. • Discussion

Engagement in Plant Pathology: You Can't Start Too Early

8:30 a.m. - 11:30 a.m.; Ballroom C, CC

Organizer/Moderator: David Gadoury, Cornell University, Geneva, NY, U.S.A.
Section: Professionalism/Outreach
Sponsoring Committees/Sponsors: D. M. Gadoury, APS internal communications officer; CADRE; Office of Public Relations and Outreach (OPRO); Teaching

8:30 a.m. • 29-S
Kids and plants: The summer science camp for elementary school students. C. SMART (1), S. Reiners (1). (1) Cornell University, Geneva, NY, U.S.A.

9:00 a.m. • 30-S
Planting Science: A mentoring program in plant sciences to capture the interest of middle and high school students. C. T. ADAMS (1). (1) Botanical Society of America, St. Louis, MO, U.S.A.

9:30 a.m. • 31-S
Magical mushrooms and mischievous molds—The gateway to a lifelong fascination with plant pathology. G. HUDLER (1). (1) Cornell University, Ithaca, NY, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 32-S
Recruiting for the profession of plant pathology through internships. D. M. GADOURY (1). (1) Cornell University, Geneva, NY, U.S.A.

10:45 a.m. • 33-S
Reflections on an undergraduate research experience: How I was hooked. W. WELDON (1). (1) Cornell University, Geneva, NY, U.S.A.

11:15 a.m. • Discussion

Mycotoxins: From Production, Secretion, and Detection to Effects on Plants and Mammals

8:30 a.m. - 11:30 a.m.; Ballroom D, CC

Organizers: Rebecca Sweany, Louisiana State University AgCenter, Baton Rouge, LA, U.S.A.; Hillary Mehl, Virginia Tech, Suffolk, VA, U.S.A.; Zhi-Yuan Chen, Louisiana State University AgCenter, Baton Rouge, LA, U.S.A.
Moderators: Rebecca Sweany and Kenneth Damann, Louisiana State University AgCenter, Baton Rouge, LA, U.S.A.
Section: Biology of Pathogens
Sponsoring Committee/Sponsor: Mycotoxicology

8:30 a.m. • 34-S
The Cross-kingdom languages of *Aspergillus flavus*. N. KELLER (1), J. Spraker (1), G. Fischer (1). (1) University of Wisconsin, Madison, WI, U.S.A.

9:00 a.m. • 35-S
Cellular localization of mycotoxin synthesis and mechanisms for export. M. Boenisch (1), B. Yordem (2), K. Broz (2), H. C. KISTLER (2). (1) University of Minnesota, St. Paul, MN, U.S.A.; (2) USDA, University of Minnesota, St. Paul, MN, U.S.A.

9:30 a.m. • 36-S
Using immunology and LC-MS/MS to simultaneously detect multiple mycotoxins in food and feed. P. LI (1), Z. Zhang (1), Q. Zhang (1). (1) Oil Crops Research Institute of CAAS, Wuhan, China

10:00 a.m. • Break

10:15 a.m. • 37-S
Feeding issues in hogs, cattle and poultry from diseased and mycotoxin contaminated grain. B. RICHERT (1). (1) Purdue University, West Lafayette, IN, U.S.A.

10:45 a.m. • 38-S
Human health effects of mycotoxins: Advances and updates. J. S. WANG (1). (1) University of Georgia, Athens, GA, U.S.A.

11:15 a.m. • Discussion

Phytobiome-Plant Interactions: Bridging Phytobiome Structure and Function

8:30 a.m. - 11:30 a.m.; Ballroom E, CC

Organizers: Caroline Roper, University of California, Riverside, CA, U.S.A.; Martin Chilvers, Michigan State University, East Lansing, MI, U.S.A; Linda Kinkel and Laura Felice, University of Minnesota, St. Paul, MN, U.S.A.; Jose Pablo Soto-Arias, University of Wisconsin, Madison, WI, U.S.A.
Moderators: Martin Chilvers, Michigan State University, East Lansing, MI, U.S.A; Caroline Roper, University of California, Riverside, CA, U.S.A.
Section: Ecology and Epidemiology
Sponsoring Committees/Sponsors: Bacteriology; Evolutionary Genetics and Genomics; Soil Microbiology and Root Disease, Public Policy Board
Financial Sponsor: The Samuel Roberts Noble Foundation

8:30 a.m. • 39-S
Plants, living with their phytobiomes. J. TIEDJE (1). (1) Michigan State University, East Lansing, MI, U.S.A.

9:00 a.m. • 40-S
The grape endophytic microbiome and its impact on Pierce's disease development. P. E. ROLSHAUSEN (1), J. I. Yang (2), P. Ruegger (1), J. Borneman (1), C. Roper (1). (1) University of California, Riverside, CA, U.S.A.; (2) National Taiwan University, Taipei, CA, Taiwan

9:30 a.m. • 41-S
Plant determinants of root microbiome composition. S. LEBEIS (1), S. Herrera Paredes (2), D. Lundberg (3), J. Dangl (2). (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) University of North Carolina, Chapel Hill, NC, U.S.A.; (3) Max Planck Institute, Tubebingen, Germany

10:00 a.m. • Break

10:15 a.m. • 42-S
Oomycete community diversity: The soybean root rot complex. A. ROJAS (1), J. L. Jacobs (2), C. A. Bradley (3), D. M. Malvick (4), B. D. Nelson (5), A. Robertson (6), A. U. Tenuta (7), K. A. Wise (8), L. Giesler (9), D. Jardine (10), J. Rupe (11), M. I. Chilvers (2). (1) Michigan State University, East Lansing , MI, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.; (3) University of Illinois, Urbana, IL, U.S.A.; (4) University of Minnesota, St. Paul, MN, U.S.A.; (5) Department of Plant Pathology, North

(continued)

Dakota State University, Fargo, ND, U.S.A.; (6) Iowa State University, Ames, IA, U.S.A.; (7) Ontario Ministry of Agriculture Food and Rural Affairs, Ridgetown, ON, Canada; (8) Purdue University, West Lafayette, IN, U.S.A.; (9) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (10) Kansas State University, Manhattan, KS, U.S.A.; (11) University of Nebraska, Fayetteville, AR, U.S.A.

10:45 a.m. • 43-S
Local and systemic bacterial colonization of germ-free plants with synthetic microbial communities of the Arabidopsis microbiota. Y. BAI (1), G. Srinivas (1), D. B. Mueller (2), J. Vorholt (3), P. Schulze-Lefert (1). (1) Max Planck Inst Zuchtungsforschung, Cologne, Germany; (2) ETH, zurich, Switzerland; (3) ETH, Zurich, Switzerland

11:15 a.m. • Discussion

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

10:15 a.m. - 11:45 a.m.; Ballroom F, CC

Organizer: Jay Pscheidt, Oregon State University, Corvallis, OR, U.S.A.
Moderators: Jay Pscheidt, Oregon State University, Corvallis, OR, U.S.A.; Lawrence Datnoff, Louisiana State University, Baton Rouge, LA, U.S.A.
Section: Professionalism/Outreach
Sponsoring Committees/Sponsors: Division Forum: Jay Pscheidt and David Rosenberger

10:15 a.m. • 44-S
Caribbean Division – An approach for screening *Musa* accessions for resistance to virulent *Mycosphaerella fijiensis* isolates. L. GANAN (1), E. Alvarez (1). (1) CIAT, Palmira, Colombia

10:30 a.m. • 45-S
North Central Division – Overexpression of a modified eIF4E gene confers broad-spectrum resistance to *Potato virus Y* and is dominantly inherited in various potato varieties. E. ARCIBAL (1), M. Jahn (2), J. Jiang (2), A. Rakotondrafara (2). (1) Univ of Wisconsin, Madison, WI, U.S.A.; (2) University of Wisconsin, Madison, WI, U.S.A.

10:45 a.m. • 46-S
Northeastern Division – Establishment of soil and tissue potassium sufficiency ranges for control of anthracnose disease on annual bluegrass turf. C. J. SCHMID (1), J. A. Murphy (1), B. B. Clarke (2). (1) Rutgers Univ, New Brunswick, NJ, U.S.A.; (2) Rutgers University, New Brunswick, NJ, U.S.A.

11:00 a.m. • 47-S
Pacific Division – Endophytic bacteria as biological control for the management of *Fusarium euwallaceae* – a symbiotic fungus of the Polyphagous Shot Hole Borer. F. NA (1), D. H. Wang (1), M. Twizeyimana (1), J. S. Mayorquin (1), K. Sugino (1), J. D. Carrillo (1), A. Eskalen (1). (1) University of California, Riverside, CA, U.S.A.

11:15 a.m. • 48-S
Potomac Division – Evaluation of fungicides for efficacy against pod rot of lima bean caused by *Phytophthora capsici*. A. A. KNESS (1), G. C. Johnson (2), N. M. Donofrio (1), T. A. Evans (1), E. G. Ernest (2), K. L. Everts (3), N. F. Gregory (1), H. N. Baker (2). (1) University of Delaware, Newark, DE, U.S.A.; (2) University of Delaware, Georgetown, DE, U.S.A.; (3) University of Maryland, Salisbury, MD, U.S.A.

11:30 a.m. • 49-S
Southern Division – Pathogenicity evaluations of novel ectotrophic root-infecting fungi on ultradwarf bermudagrass. P. L. VINES (1), M. Tomaso-Peterson (2), T. Allen (2). (1) Mississippi State Univ, Mississippi State, MS, U.S.A.; (2) Mississippi State University, Mississippi State, MS, U.S.A.

8:30 a.m. Technical Sessions

Fungicide Resistance-Session 1

8:30 a.m. - 9:45 a.m.; Ballroom G, CC

Moderators: Bruna Forcelini, University of Florida, Wimauma, FL, U.S.A.; Cruz Avila-Adame, Dow AgroSciences LLC, Indianapolis, IN, U.S.A.

8:30 a.m. • 26-O
Pathogenicity and virulence of *Zymoseptoria tritici* with mutations conferring resistance to multiple fungicide modes of action. C. AVILA-ADAME (1), P. Gandra (2), J. Cao (2), R. Ponnala (2), T. Slanec (2). (1) Dow AgroSciences LLC, Indianapolis, IN, U.S.A.; (2) Dow AgroSciences, Indianapolis, IN, U.S.A.

8:45 a.m. • 27-O
Fungicide resistance profiles of blossom-derived *Botrytis* isolates from strawberry fields. M. J. HU (1), D. Fernández-Ortuño (2), P. K. Bryson (1), G. Schnabel (1). (1) School of Agricultural, Forest & Environmental Sciences, Clemson University, Clemson, SC, U.S.A.; (2) Instituto de Hortofruticultura Subtropical y Mediterránea "La Mayora"-Universidad de Málaga-Consejo Superior de Investigaciones Científicas (IHSM-UMA-CSIC), Dept. de Microbiología, Campus de Teatinos, Málaga, Spain

9:00 a.m. • 28-O
Fitness and Competitive Ability of *Alternaria alternate* Field Isolates with Resistance to SDHI, QoI, and MBC Fungicides. Z. FAN (1), G. Schnabel (2). (1) Clemson Unversity, Central, SC, U.S.A.; (2) Clemson Unversity, Clemson, SC, U.S.A.

9:15 a.m. • 29-O
Quantifying the evolution of fungicide-resistance from seed and foliar treatments: a modeling analysis. J. L. KITCHEN (1), F. van den Berg (1), N. D. Paveley (2), F. van den Bosch (1). (1) Rothamsted Research, Harpenden, United Kingdom; (2) ADAS UK Ltd, Duggleby, Malton, United Kingdom

9:30 a.m. • 31-O
Insight into DMI-resistance – RNA-seq analysis of *Cercospora beticola* DMI-resistant and -sensitive strains in response to tetraconazole. M. BOLTON (1), L. Faino (2), B. Thomma (2), R. De Jonge (3), G. Secor (4). (1) USDA ARS, Fargo, ND, U.S.A.; (2) Wageningen University, Wageningen, Netherlands; (3) Ghent University, Ghent, Belgium; (4) North Dakota State University, Fargo, ND, U.S.A.

Pathogen Detection Technologies-Session 1

8:30 a.m. - 9:45 a.m.; Ballroom H, CC

Moderators: Akhtar Ali, University of Tulsa, Tulsa, OK, U.S.A; Xue Feng, University of Idaho, Moscow, ID, U.S.A.

8:30 a.m. • 31-O
Using next-generation sequencing to develop species-specific molecular diagnostics for cucurbit downy mildew. L. QUESADA-OCAMPO (1), S. Withers (1), E. Gongora-Castillo (2), D. Gent (3), P. Ojiambo (1). (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.; (3) USDA-ARS, Corvallis, OR, U.S.A.

8:45 a.m. • 32-O
Systematic development of species-specific assays for important *Phytophthora* spp. using recombinase polymerase amplification. T. D. MILES (1), F. N. Martin (2). (1) California State University Monterey Bay, Seaside, CA, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.

9:00 a.m. • 33-O
Molecular technology as a useful tool for nematode diagnostics: A case study of root-lesion nematode and cereal cyst nematode. G. P. YAN (1). (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.

9:15 a.m. • 34-O
Development of a novel isothermal AmplifyRP method combining both real-time and endpoint assays in single tubes for rapid detection of plant pathogens. S. ZHANG (1), P. Russell (1), N. McOwen (2), S. Bohannon (2), B. Davenport (2). (1) Agdia, Inc, Elkhart, IN, U.S.A.; (2) Agdia Inc., Elkhart, IN, U.S.A.

9:30 a.m. • 35-O
Comparative Genomics-based Development of a LAMP Detection Assay for Boxwood Blight. M. MALAPI-WIGHT (1), J. Demers (1), D. Veltri (2), J. A. Crouch (1). (1) USDA ARS, Beltsville, MD, U.S.A.; (2) Rutgers University, New Brunswick, NJ, U.S.A.

10:15 a.m. Technical Sessions

Fungal and Fungal-Like Pathogenicity
10:15 a.m. - 11:30 a.m.; Ballroom G, CC
Moderators: Sally Mallowa, Iowa State University, Ames, IA, U.S.A.; Mehdi Kabbage, University of Wisconsin, Madison, WI, U.S.A.

10:15 a.m. • 36-O
Genomics and effector characterization of the novel sugar beet pathogen *Fusarium secorum*. Z. BIAN (1), R. De Jonge (2), G. Secor (1), M. Bolton (3). (1) North Dakota State University, Fargo, ND, U.S.A.; (2) Ghent University, Ghent, Belgium; (3) USDA ARS, Fargo, ND, U.S.A.

10:30 a.m. • 37-O
Identification of a Toxic Protein, FvTox6, Produced by *Fusarium virguliforme* that Causes Foliar Symptoms Typical of Soybean Sudden Death Syndrome. H. X. CHANG (1), L. L. Domier (2), O. Radwan (3), C. Yendrek (4), M. Hudson (3), G. L. Hartman (5). (1) Univ of Illinois, Urbana, IL, U.S.A.; (2) USDA–Agricultural Research Service, University of Illinois, Urbna, IL, U.S.A.; (3) University of Illinois, Urbana, IL, U.S.A.; (4) Institute for Genomic Biology, Urbana, IL, U.S.A.; (5) USDA–Agricultural Research Service, University of Illinois, Urbana, IL, U.S.A.

10:45 a.m. • 38-O
The role of Avr4 in *Cercospora kikuchii* virulence and cercosporin biosynthesis. J. S. REZENDE (1), Z. Y. Chen (1). (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.

11:00 a.m. • 39-O
Adaptation to host resistance genes by *Phytophthora nicotianae*. K. L. MCCORKLE (1), R. S. Lewis (1), H. D. Shew (1). (1) North Carolina State University, Raleigh, NC, U.S.A.

11:15 a.m. • 40-O
Genetic architecture of complex traits of *Phytophthora infestans* determined through genome-wide association mapping. G. DANIES (1), J. A. Romero-Navarro (1), L. N. Gonzalez-Garcia (2), K. Myers (1), E. Bevels (1), M. Bond (3), Y. Wu (1), S. Restrepo (2), W. E. Fry (1). (1) Cornell University, Ithaca, NY, U.S.A.; (2) Universidad de los Andes, Bogotá, Colombia; (3) University of Hawaii at Manoa, Manoa, HI, U.S.A.

Weather and Disease Models
10:15 a.m. - 11:30 a.m.; Ballroom H, CC
Moderators: Alissa Kriss, Syngenta, Greensboro, NC, U.S.A.; Sowmya Ramachandran, Washington State University, Pullman, WA, U.S.A.

10:15 a.m. • 41-O
Chondrostereum purpureum from apple and blueberry: temperatures for spore release and germination, and virulence of mono and dikaryotic mycelia. R. A. FRANCE (1), D. E. Grinbergs (1). (1) Inst de Investigaciones Agropecuarias, Chillan, Chile

10:30 a.m. • 42-O
The effect of relative humidity on colonization of citrus twigs by *Phyllosticta citricarpa*, the citrus black spot pathogen. N. Y. WANG (1), M. M. Dewdney (1). (1) University of Florida, Lake Alfred, FL, U.S.A.

10:45 a.m. • 43-O
Comparison of weather conditions influencing stripe rust epidemics in the Great Plains, Northwestern and Southern United States. B. S. GRABOW (1), E. D. De Wolf (2). (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Kansas State Univ, Manhattan, KS, U.S.A.

11:00 a.m. • 44-O
A new mechanistic model to simulate effects of diurnal temperature oscillations on potato late blight development. A. H. C. VAN BRUGGEN (1), S. K. Shakya (2), H. A. Narouei Khandan (3), J. L. Andrade-Piedra (4), E. M. Goss (3), N. S. Dufault (3). (1) Univ of Florida, Gainesville, FL, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) University of Florida, Gainesville, FL, U.S.A.; (4) CIP, Lima, Peru

11:15 a.m. • 45-O
Development of a predictive model to estimate conditions lethal to soilborne inoculum of *Phytophthora ramorum* and *pini* during soil solarization. F. FUNAHASHI (1), J. Parke (1). (1) Oregon State University, Corvallis, OR, U.S.A.

(continued)

TUESDAY MORNING, AUGUST 4

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/SCIPROGRAM/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.
Meeting room key: CC = Convention Center

Special Sessions

Emerging Downy Mildew Diseases: Where Have We Been, Where Are We Going?

8:30 a.m. - 11:30 a.m.; Ballroom D, CC

Organizers: Jo Anne Crouch, USDA-ARS-SMML, Beltsville, MD, U.S.A.; Cristi Palmer, The IR-4 Project, Princeton, NJ, U.S.A.
Moderators: Cristi Palmer, The IR-4 Project, Princeton, NJ, U.S.A.; Nina Chickoff, USDA-ARS, Fort Detrick, MD, U.S.A.
Section: Diseases of Plants
Sponsoring Committees/Sponsors: Emerging Diseases and Pathogens; Diseases of Ornamental Plants

8:30 a.m. • 50-S
Where have all these emergent downy mildews come from? Using herbarium collections and comparative genomic tools to retrace pathogen populations. J. CROUCH (1). (1) USDA-ARS-SMML, Beltsville, MD, U.S.A.

9:00 a.m. • 51-S
The utility of comparative mitochondrial genomics of downy mildews for development of molecular tools for identification and diagnostics. F. N. MARTIN (1). (1) USDA-ARS, Salinas, CA, U.S.A.

9:30 a.m. • 52-S
How can we minimize our losses? Control strategies in downy mildew systems. M. HAUSBECK (1). (1) Michigan State University, East Lansing, MI, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 53-S
Predicting epidemics: Risk assessment and role of host susceptibility in cucurbit downy mildew outbreaks. P. OJIAMBO (1). (1) North Carolina State University, Raleigh, NC, U.S.A.

10:45 a.m. • 54-S
Comparative genomics of inter- and intra-specific variation in downy mildews. R. MICHELMORE (1), L. Derevnina (1), S. Reyes-Chin-Wo (2), K. Wood (1), J. Wong (1), F. Martin (3), J. Gil (1), C. Tsuchida (1), I. Simmon (1), S. Klosterman (3), C. Magill (4), O. Spring (5), R. Sharma (6), R. Varshney (6), O. Ochoa (1). (1) University of California, Davis, Davis, CA, U.S.A.; (2) Unviersity of California, Davis, Davis, CA, U.S.A.; (3) USDA ARS, Salinas, CA, U.S.A.; (4) Texas A&M, College Station, TX, U.S.A.; (5) University of Hohenheim, Hohenheim, Germany; (6) ICRISAT, Hyderabad, India

11:15 a.m. • Discussion

Impact of Repeat Elements on Genome Evolution and Pathogen Biology

8:30 a.m. - 11:30 a.m.; Ballroom A, CC

Organizers: Steve Klosterman, USDA-ARS, Salinas, CA, U.S.A.; Shuxian Li, USDA-ARS, Stoneville, MS, U.S.A.
Moderator: Steve Klosterman, USDA-ARS, Salinas, CA, U.S.A.
Section: Molecular/Cellular/Plant-Microbe Interactions
Sponsoring Committee/Sponsor: Evolutionary Genetics and Genomics
Financial Sponsor: The Samuel Roberts Noble Foundation

8:30 a.m. • 55-S
Repetitive DNA and effectors in the compartmentalized genomes of *Fusarium oxysporum* species complex. P. Travers (1), Y. Zhang (1), L. J. MA (1). (1) University of Massachusetts Amherst, Amherst, MA, U.S.A.

9:00 a.m. • 56-S
Comparative genome analysis of members of Magnaporthaceae sheds light on pathogenesis. L. H. Okagaki (1), J. K. Salisbury (1), T. John (1), B. Clay (1), Y. Oh (1), R. A. DEAN (1). (1) Center for Integrated Fungal Research, North Carolina State University, Raleigh, NC, U.S.A.

9:30 a.m. • 57-S
Repeats, RIPping and genome evolution in *Mycosphaerella graminicola* (*Zymoseptoria tritici*), the cause of septoria tritici blotch of wheat. S. B. GOODWIN (1). (1) USDA-ARS / Purdue University, West Lafayette, IN, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 58-S
Effector diversification within compartments of the *Leptosphaeria maculans* genome. T. ROUXEL (1), M. H. Balesdent (1), J. Grandaubert (1). (1) INRA, Thiverval-Grignon, France

10:45 a.m. • 59-S
Repetitive elements, architects of genomic variation in *Verticillium*. K. F. DOBINSON (1), S. J. Klosterman (2), A. Anchieta (2), Z. Li (3), S. Amyotte (4), L. J. Ma (5). (1) Dept. of Biology, University of Western Ontario, London, ON, Canada; (2) USDA-ARS, Salinas, CA, U.S.A.; (3) State Key Laboratory of Cotton Biology, Cotton Research Institute, Anyang Henan, , China; (4) Phirelight Security Solutions Inc., Ottawa, ON, Canada; (5) Dept. of Microbiology & Molecular Biology, University of Massachusetts-Amherst, Amherst, MA, U.S.A.

11:15 a.m. • Discussion

Nematology: From Microbiomes to Management

8:30 a.m. - 11:30 a.m.; Ballroom E, CC

Organizers/Moderators: Gregory Tylka, Iowa State University, Ames, IA, U.S.A.; Vergel Concibido, Monsanto Company, Chesterfield, MO, U.S.A.
Section: Biology of Pathogens
Sponsoring Committees/Sponsors: Nematology
Financial Sponsors: Monsanto Company, Bayer CropScience

8:30 a.m. • 60-S
Soil microbiome potential for management of phytoparasitic nematodes. A. CIANCIO (1), M. Colagiero (2), I. Pentimone (2), L. Rosso (2). (1) CNR, Istituto per la Protezione Sostenibile delle Piante - IPSP, Bari, Italy; (2) CNR IPSP, Bari, Italy

9:00 a.m. • 61-S
Comparative nematode neuroanatomy: Wandering through worm wiring. N. SCHROEDER (1), Z. Han (1). (1) University of Illinois Urbana-Champaign, Urbana, IL, U.S.A.

9:30 a.m. • 62-S
Multitrophic interactions and the chemical ecology of nematodes. J. G. ALI (1). (1) Michigan State University, Entomology Department, East Lansing, MI, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 63-S
Breeding for nematode resistance: new phenotypic tools for a new era. S. COOPER (1), A. Coburn (1), M. Easter (2), J. Yates (1). (1) Monsanto Company, Chesterfield, MO, U.S.A.; (2) Monsanto Company, Chestefield, MO, U.S.A.

10:45 a.m. • 64-S
Advances in science to meet real world crop production needs. D. SKLARCZYK (1). (1) Sklarczyk Seed Farm LLC, Johannesburg, MI, U.S.A.

11:15 a.m. • Discussion

New Products & Services

8:30 – 11:30 a.m.; Ballroom B, CC

Organizer/Moderator: Christopher B. Meador, Weatherford, TX, U.S.A.
Section: Disease Control and Pest Management
Sponsoring Committee/Sponsor: Industry

8:30 a.m. • 65-S
Zephyr Pathogen Identifier for plant pathogens. A. R. FLANNERY (1). (1) PathSensors, Inc., Baltimore, MD, U.S.A.

8:40 a.m. • 66-S
New non-fumigant contact nematicide, NIMITZ, registered by EPA. H. YOUNG (1). (1) ADAMA, Raleigh, NC, U.S.A.

8:50 a.m. • 67-S
New Grapevine LR3 Reagent. A. WEI (1). (1) Agri-Analysis LLC, West Sacramento, CA, U.S.A.

9:00 a.m. • 68-S
ARM Trial Management for 2016. S. GYLLING (1). (1) Gylling Data Management, Inc., Brookings, SD, U.S.A.

9:10 a.m. • 69-S
New products and label updates from Syngenta. R. BOUNDS (1). (1) Syngenta Crop Protection, Visalia, CA, U.S.A.

9:20 a.m. • 70-S
Potyvirus ImmunoStrip. H. CHAMBERS (1). (1) Agdia, Inc., Elkhart, IN, U.S.A.

9:30 a.m. • 71-S
Pyriofenone. C. GEE (1). (1) ISK Biosciences, Kearney, MO, U.S.A.

9:40 a.m. • 72-S
Kenja/Isofetamid. C. GEE (1). (1) ISK Biosciences, Kearney, MO, U.S.A.

9:50 a.m. • 73-S
Introduction of Next Generation Sequencing. D. LUO (1). (1) Novogene Bioinformatics Technology, Inc., Beijing, China

10:00 a.m. • Break

10:15 a.m. • 74-S
ILeVO. J. RIGGS (1). (1) Bayer Crop Science, Research Triangle Park, NC, U.S.A.

10:25 a.m. • 75-S
AmyProtec 42 Biofungicide. B. STONEMAN (1). (1) Andermatt Biocontrol AG, McFarland, WI, U.S.A.

10:35 a.m. • 76-S
Oxiphos. V. CHOPPAKATLA (1). (1) Biosafe Systems, East Hartford, CT, U.S.A.

10:45 a.m. • 77-S
Terraclean 5.0. V. CHOPPAKATLA (1). (1) Biosafe Systems, East Hartford, CT, U.S.A.

11:15 a.m. • 78-S
Soil and spray adjuvant contributions from Simplot Grower Solutions. L. FOUGHT (1). (1) Simplot, Madera, CA, U.S.A.

11:25 a.m. • Discussion

Seed Transmission of Vector-Borne Pathogens: Mysteries, Caveats, and Mechanisms

8:30 a.m. - 11:30 a.m.; Ballroom C, CC

Organizers: Phyllis Himmel, Marrone Bio Innovations, Davis, CA, U.S.A.; Ron Wallcott, University of Georgia, Athens, GA, U.S.A.; Judith Brown, The University of Arizona, Tucson, AZ, U.S.A.
Moderators: Ron Wallcott, University of Georgia, Athens, GA, U.S.A.; Phyllis Himmel, Marrone Bio Innovations, Davis, CA, U.S.A.
Section: Ecology and Epidemiology
Sponsoring Committees/Sponsors: Vector-Pathogen Complexes; Seed Pathology

8:30 a.m. • 79-S
The impact of bacterial and viral diseases in hybrid seed production: The human factor. C. J. KUROWSKI (1). (1) Monsanto Company, Woodland, CA, U.S.A.

9:00 a.m. • 80-S
Introduction and overview of viruses seed-transmitted and non-persistently transmitted by aphids. S. A. TOLIN (1). (1) Virginia Polytechnic Institute and State University, Blacksburg, VA, U.S.A.

9:30 a.m. • 81-S
Detection methods for *Candidatus* Liberibacter, and the threat of transmission in true seed and vegetatively propagated plant parts. J. K. BROWN (1). (1) The University of Arizona, Tucson, AZ, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 82-S
Survey of diagnostic tools for detection of viroids and impacts of test results on the seed industry. R. W. HAMMOND (1). (1) USDA ARS NEA MPPL, Beltsville, MD, U.S.A.

10:45 a.m. • 83-S
Role of seed transmission in the spread of maize lethal necrosis in East Africa. M. G. REDINBAUGH (1). (1) USDA, ARS Corn Soybean and Wheat Quality Research and Ohio State University, Wooster, OH, U.S.A.

11:15 a.m. • Discussion

Life Beyond the Plant: Bacterial Wars

2:15 p.m. - 3:30 p.m.; Ballroom B, CC

Organizers: Alejandra I. Huerta, University of Wisconsin, Madison, WI, U.S.A.; Jong Hyun Ham, Louisiana State University Agriculture Center, Baton Rouge, LA, U.S.A.
Moderators: Anna Testen, The Ohio State University OARDC, Wooster, OH, U.S.A.; Ana Cristina Fulladolsam University of Wisconsin, Madison, WI, U.S.A
Section: Biology of Pathogens
Sponsoring Committees/Sponsors: Graduate Student; Bacteriology; Biological Control

2:15 p.m. • 84-S
Biochemical and structural basis of toxicity and immunity in contact-dependent growth inhibition (CDI) systems. D. A. LOW (1), Z. Ruhe (1), C. Hayes (1), S. Koskiniemi (2), C. Goulding (3), S. Poole (1). (1) University of California, Santa Barbara, CA, U.S.A.; (2) Uppsala University, Uppsala, Sweden; (3) University of California, Irvine, CA, U.S.A.

(continued)

2:45 p.m. • 85-S
Molecular mechanisms of the *Agrobacterium* Type VI DNase effector secretion and antibacterial activity during plant colonization. D. Bondge (1), J. S. Lin (1), L. S. Ma (1), E. M. LAI (1). (1) Institute of Plant and Microbial Biology, Academia Sinica, Taipei, Taiwan

3:15 p.m. • 86-S
Identification and characacterization of interstrain chemical weapons in the *Ralstonia solanacearum* species complex. A. I. HUERTA (1), F. Ailloud (2), C. Allen (3). (1) University of Wisconsin - Madison, Madison, WI, U.S.A.; (2) CIRAD, UMR Peuplements Végétaux et Bioagresseurs en Milieu Tropical, CIRAD-Université de la Réunion, Pôle de Protection des Plantes, Saint Pierre, La Réunion, France; 3ANSES Plant Health Laboratory, Saint Pierre, La Réunion, , France; (3) University of Wisconsin-Madison, Madison, WI, U.S.A.

8:30 a.m. Technical Sessions

Bacterial Virulence in the Xylem
8:30 a.m. - 9:45 a.m.; Ballroom F, CC

Moderators: Tiffany Lowe, University of Wisconsin, Madison, WI, U.S.A.; Greta Schuster, Texas A&M University, Kingsville, TX, U.S.A.

8:30 a.m. • 46-O
The importance of cold shock proteins in *xylella fastidiosa* virulence. L. BURBANK (1), D. C. Stenger (1). (1) USDA Agricultural Research Service, Parlier, CA, U.S.A.

8:45 a.m. • 47-O
Characterization the role of a virulence factor PD1311 in *Xylella fastidiosa*. L. HAO (1), P. Mowery (2), L. C. Parent (2), K. Johnson (3), T. Burr (1). (1) Cornell University, Geneva, NY, U.S.A.; (2) Hobart and William Smith Colleges, Geneva, NY, U.S.A.; (3) none, Washington DC, WA, U.S.A.

9:00 a.m. • 48-O
Xylella fastidiosa chemosensory-like PilG protein involvement in Pierce's disease. L. Hao (1), L. Cursino (2), K. Johnson (3), T. J. Burr (3), P. MOWERY (2). (1) Cornell University, Geneva, NY, U.S.A.; (2) Hobart & William Smith Colleges, Geneva, NY, U.S.A.; (3) Cornell University / New York State Agricultural Experiment Station, Geneva, NY, U.S.A.

9:15 a.m. • 49-O
Identification of novel secreted virulence factors from *Xylella fastidiosa* using a TRV expression system. S. A. LEE (1), E. E. Rogers (1). (1) USDA-ARS, SJVASC, Parlier, CA, U.S.A.

9:30 a.m. • 50-O
Systemic movement by *Clavibacter michiganensis* subsp. *michiganensis* in the tomato vasculature. M. A. TANCOS (1), C. D. Smart (2). (1) Cornell Univ, Geneva, NY, U.S.A.; (2) Cornell University NYSAES, Geneva, NY, U.S.A.

Epidemiology and Disease Management
8:30 a.m. - 9:45 a.m.; Ballroom G, CC

Moderators: Shunping Ding, University of Wisconsin, Madison, WI, U.S.A.; Kelly Ivors, California Polytechnic State University, San Luis Obispo, CA, U.S.A.

8:30 a.m. • 51-O
Spatial pattern analysis of the incidence of strawberry angular leaf spot under outdoor growing conditions in California. C. GIGOT (1), N. McRoberts (1), W. Turechek (2). (1) Plant Pathology Department, University of California, Davis, CA, U.S.A.; (2) Horticulture Research Laboratory, USDA-ARS, Fort Pierce, FL, U.S.A.

8:45 a.m. • 52-O
Improved residential citrus host mapping and its potential influence on Asian Citrus Psyllid (ACP) population. W. LUO (1), T. Gottwald (2), G. McCollum (3). (1) USDA ARS, Ft Pierce, FL, U.S.A.; (2) U.S. Horticultural Research Laboratory, USDA ARS, Fort Pierce, FL, U.S.A.; (3) USDA ARS, Fort Pierce, FL, U.S.A.

9:00 a.m. • 53-O
The population dynamics of coexistence between *Cochliobolus sativus* and *Fusarium pseudograminearum* in wheat. E. GUNNINK TROTH (1), J. Johnston (1), A. Dyer (1). (1) Montana State University, Bozeman, MT, U.S.A.

9:15 p.m. • 54-O
Genome-informed diagnostics to discriminate geographically isolated populations of the select agent *Rathayibacter toxicus*. M. ARIF (1), G. Y. Busot (1), R. Mann (2), B. Rodoni (2), S. Liu (3), J. P. Stack (1). (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (2) Department of Primary Industries, La Trobe University, Bundoora, Australia; (3) Department of Plant Pathology, Kansas State University, Manhattan, Australia

9:30 a.m. • 55-O
Epidemiology and management of bacterial spot of almond, caused by *Xanthomonas arboricola* pv. *pruni*. S. HAACK (1), L. Wade (2), H. Forster (1), J. E. Adaskaveg (1). (1) University of California, Riverside, Riverside, CA, U.S.A.; (2) Arysta LifeScience, Cary, NC, U.S.A.

10:15 a.m. Technical Sessions

Bacterial Pathogenicity
10:15 a.m. - 11:30 a.m.; Ballroom F, CC

Moderators: Jonathan Jacobs, IRD, Institut de Recherche pour le Developpement, Montpellier, France; Sarah Light, Oregon State University, Hermiston, OR, U.S.A.

10:15 a.m. • 56-O
Spots on pot: Comparative genomics of two cannabis pathogens reveals insight into the evolution of *Xanthomonas* pathogenicity. J. M. JACOBS (1), C. Pesce (2), P. Lefeuvre (3), R. Koebnik (1). (1) Institut de recherche pour le développement - RPB, Montpellier, France; (2) Inst de Recherche Pour Le Dev - RPB, Montpellier, France; (3) CIRAD, St. Pierre, France

10:30 a.m. • 57-O
Genome-wide binding sites identification of a GntR transcriptional regulator required for virulence in *Xanthomonas citri* subsp. *citri*. X. ZHOU (1), Q. Yan (2), Y. Zhang (3), N. Wang (3). (1) Univ of Florida, Lake Alfred, FL, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) University of Florida, Lake Alfred, FL, U.S.A.

10:45 a.m. • 58-O
The PdeR-TriP interaction mediates a novel c-di-GMP signaling pathway to regulate virulence of *Xanthomonas oryzae* pv. *oryzae*. H. Li (1), F. Tian (1), D. Xue (1), H. Chen (1), X. Yuan (2), C. H. Yang (2), C. HE (1). (1) Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, China; (2) Department of Biological Sciences, University of Wisconsin-Milwaukee, Milwaukee, WI, U.S.A.

11:00 a.m. • 59-O
A Thief in the Blight: What Can *Erwinia amylovora* Bacteria Steal from Their Host? L. RAMOS (1), J. Sinn (1), B. Lehman (2), E. Pfeufer (1), K. Peter (3), T. McNellis (1). (1) The Pennsylvania State University, State College, PA, U.S.A.; (2) Penn State University - Fruit Research Extension Center, Biglerville, PA, U.S.A.; (3) The Pennsylvania State University / Penn State University - Fruit Research Extension Center, State College, PA, U.S.A.

11:15 a.m. • 60-O
Real time imaging of cucurbit infection by *Erwinia tracheiphila*. C. M. VRISMAN (1), G. Rajashekara (1), S. A. Miller (1). (1) Ohio State Univ, Wooster, OH, U.S.A.

Biological Control of Plant Diseases
10:15 a.m. - 11:15 a.m.; Ballroom G, CC

Moderators: Elisha Allan, University of Massachusetts, Amherst, MA, U.S.A.; Patricia Mowery, Hobart and William Smith Colleges, Geneva, NY, U.S.A.

10:15 a.m. • 61-O
Biological Control of Multiple Plant Diseases and Plant Growth Promotion in the Presence of Pathogens by Plant Growth-Promoting Rhizobacteria (PGPR). K. LIU (1), J. W. Kloepper (1), J. A. McInroy (1), C. H. Hu (1). (1) Auburn University, Auburn, AL, U.S.A.

62-O WITHDRAWN

10:30 a.m. • 63-O
Distribution of endophytic bacteria-*Bacillus amyloliquefaciens* SPX1 in tomato tissues and its potential on control of tomato bacterial wilt. H. R. PAN (1), Y. J. Chen (2), W. H. Chung (1). (1) National Chung Hsing University, Taichung, Taiwan; (2) Kaohsiung District Agricultural Research and Extension Station, Pingtung, Taiwan

10:45 a.m. • 64-O
Antifungal and antioomycete properties of California *Collimonas* isolates and their use in synergy-based biocontrol of Fusarium wilt of tomato. H. K. DOAN (1), N. Maharaj (1), E. Miyao (2), R. M. Davis (3), J. H. Leveau (3). (1) Univ of California, Davis, CA, U.S.A.; (2) University of California, Woodland, CA, U.S.A.; (3) University of California, Davis, CA, U.S.A.

11:00 a.m. • 65-O
Suppression of root diseases and enhancement of VA mycorrhizal population in sunflower and tomato by the mycorrhizospheric fluorescent *Pseudomonas*. S. EHTESHAMUL-HAQUE (1), S. S. Bokhari (2), S. A. Ali (3), V. Sultana (4), J. Ara (5). (1) Department of Botany, University of Karachi, Karachi, Pakistan; (2) Department of Botany, University of Karachi, Karachi, Pakistan; (3) HEJ Research Institute of Chemistry, University of Karachi, Karachi, Pakistan; (4) Department of Biochemistry, University of Karachi, Karachi, Pakistan; (5) Department of Food Science & Technology, University of Karachi, Karachi, Pakistan

Impact of Cultural Management on Disease
10:15 a.m. - 11:30 a.m.; Ballroom H, CC

Moderators: Melody Carter, California Polytechnic State University, San Luis Obispo, CA, U.S.A.; Francesca Peduto Hand, The Ohio State University, Columbus, OH, U.S.A.

10:15 a.m. • 66-O
Dead but alive –crop and weed residues aid survival of new pathogenic *Diaporthe/Phomopsis* species on soybean, sunflower, other hosts in Australia. S. M. THOMPSON (1), Y. P. Tan (2), R. G. Shivas (2), S. M. Neate (3), E. A. Aitken (4). (1) University of Southern Queensland, Australia, Toowoomba Qld , Australia; (2) Department of Agriculture, Fisheries and Forestry, Brisbane, Australia; (3) University of Southern Queensland, Toowoomba Qld, Australia; (4) University of Queensland, Brisbane, Australia

10:30 a.m. • 67-O
Impact of cover crop termination methods on diseases of wheat and lentil. N. B. RANABHAT (1), M. E. Burrows (1), Z. J. Miller (1), E. A. Lehnhoff (1), F. D. Menalled (1). (1) Montana State University, Bozeman, MT, U.S.A.

10:45 a.m. • 68-O
Influence of pruning systems on trunk pathogens and other fungi colonizing grapevine wood. R. TRAVADON (1), P. Lecomte (2), B. Diarra (2), D. P. Lawrence (1), J. Vallance (2), H. Ojeda (3), P. Rey (2), K. Baumgartner (4). (1) Univ of California, Davis, CA, U.S.A.; (2) INRA, UMR 1065 SAVE, Université de Bordeaux, ISVV, Villenave d'Ornon, France; (3) INRA, Unité Expérimentale de Pech Rouge, Gruissan, France; (4) USDA-Agricultural Research Service, Davis, CA, U.S.A.

11:00 a.m. • 69-O
Incubation in soil reduces sporulation and risk of epidemic development from leaf disks infested by *Phytophthora ramorum*. E. K. PETERSON (1), J. L. Parke (1), N. J. Grünwald (2). (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS Horticultural Crops Research Laboratory, Corvallis, OR, U.S.A.

11:15 a.m. • 70-O
Influence of planting date, seed treatment, and cultivar on plant establishment, sudden death syndrome, and yield of soybean. Y. R. KANDEL (1), K. A. Wise (2), C. A. Bradley (3), A. U. Tenuta (4), L. F. S. Leandro (1), D. S. Mueller (1). (1) Iowa State University, Ames, IA, U.S.A.; (2) Purdue University, West Lafayette, IN, U.S.A.; (3) University of Illinois, Urbana, IL, U.S.A.; (4) Ontario Ministry of Agriculture Food and Rural Affairs, Ridgetown, ON, Canada

(continued)

TUESDAY AFTERNOON, AUGUST 4

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/SCIPROGRAM/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.
Meeting room key: CC = Convention Center

2:15 p.m. Technical Sessions

Fungal Pathogen Genetics and Biology

2:15 p.m. - 3:30 p.m.; Ballroom A, CC

Moderators: Brijesh Karakkat, University of Wisconsin, Madison, WI, U.S.A.; Eva H. Stukenbrock, Max Planck Institute for Evolutionary Biology, Plön, Schleswig-Holstein, Germany

2:15 p.m. • 71-O
Identification of novel and diverse mycoviruses through metagenomic characterization of the viromes of five fungal pathogens of major crop plants. S. Y. L. MARZANO (1), B. D. Nelson (2), O. O. Ajayi (1), C. A. Bradley (1), T. J. Hughes (3), G. L. Hartman (4), K. N. Lambert (1), L. L. Domier (4). (1) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.; (2) Department of Plant Pathology, North Dakota State University, Fargo, ND, U.S.A.; (3) Monsanto Co, Chesterfield, MO, U.S.A.; (4) USDA–Agricultural Research Services, Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.

2:30 p.m. • 72-O
Protein Signatures from Wild Type and Reduced Genomic Compliments of *Rhizoctonia solani Isolates.* B. Narayanaswamy (1), J. BIRCH (1), S. Bharathan (1), M. Chey (1), R. Connacher (1), B. Michalides (1), A. Long (1), M. Cubeta (2). (1) Indiana Univ of PA, Indiana, PA, U.S.A.; (2) North Carolina State Univ, Raleigh, NC, U.S.A.

2:45 p.m. • 73-O
Red light stimulates apothecial development of *Monilinia vaccinii-corymbosi*. J. FLORENCE (1), J. W. Pscheidt (1). (1) Oregon State University, Corvallis, OR, U.S.A.

3:00 p.m. • 74-O
Validation of transcript SSR markers in *Pseudoperonospora cubensis* from commercial and non-commercial cucurbits. E. C. WALLACE (1), L. M. Quesada-Ocampo (1). (1) North Carolina State University, Raleigh, NC, U.S.A.

3:15 p.m. • 75-O
A high-density genetic map in *Fusarium* constructed with Genotyping-by-Sequencing markers. W. YUE (1), N. M. I. Mohamed Nor (1), J. F. Leslie (1), C. Toomajian (1). (1) Kansas State University, Manhattan, KS, U.S.A.

Host Resistance

2:15 p.m. - 3:30 p.m.; Ballroom F, CC

Moderators: Gayan Kariyawasam, North Dakota State University, Fargo, ND, U.S.A.; M. A. Pastor-Corrales, USDA-ARS, Soybean Genomics and Improvement Laboratory, Beltsville, MD, U.S.A.

2:15 p.m. • 76-O
Effect of *waxy* (low amylose) on fungal infection of sorghum grain. D. L. FUNNELL-HARRIS (1), S. E. Sattler (2), P. M. O'Neill (2), K. M. Eskridge (3). (1) USDA ARS, Lincoln, NE, U.S.A.; (2) USDA-ARS; Grain, Forage and Bioenergy Research Unit, Lincoln, NE, U.S.A.; (3) Department of Statistics; University of Nebraska, Lincoln, NE, U.S.A.

2:30 p.m. • 77-O
Evidence for independent evolution of resistance to AvrPto and AvrPtoB from the wild tomato species *Solanum chmielewskii*. C. M. KRAUS (1), K. R. Munkvold (2), G. B. Martin (3). (1) Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.; (2) Boyce Thompson Institute for Plant Research, Ithaca, NY, U.S.A.; (3) Boyce Thompson Institute for Plant Research, Department of Plant Pathology and Plant-Microbe Biology, Cornell University,, Ithaca, NY, U.S.A.

2:45 p.m. • 78-O
Epistatic interaction among rust resistance genes in common bean. M. PASTOR-CORRALES (1), G. Valentini (2), Q. Song (3), P. Cregan (3). (1) USDA ARS, Beltsville, MD, U.S.A.; (2) Universidade Estadual de Maringá, Maringa, Brazil; (3) USDA/ARS, Beltsville, MD, U.S.A.

3:00 p.m. • 79-O
Identification of genomic variants of rice associated with disease resistance to sheath blight and bacterial panicle blight through NGS sequencing. B. K. Shrestha (1), D. H. Oh (2), M. Dassanayake (3), J. H. HAM (1). (1) Louisiana State Univ Agric Ctr, Baton Rouge, LA, U.S.A.; (2) Louisiana State University, Baton Rouge, LA, U.S.A.; (3) Louisiana State University, Baton Rouge , LA, U.S.A.

3:15 p.m. • 80-O
Effects of the *Lr34* and *Lr46* rust-resistance genes on different diseases of wheat. A. BANSAL (1), J. Brown (1). (1) John Innes Centre, Norwich, United Kingdom

Nematodes

2:15 p.m. - 3:30 p.m.; Ballroom G, CC

Moderators: Renan Kobayashi-Leonel, Iowa State University, Ames, IA, U.S.A.; Becky Westerdahl, University of California, Davis, CA, U.S.A.

2:15 p.m. • 81-O
Conserved nematode signaling molecules elicit plant defenses and disease resistance. M. MANOHAR (1), P. Manosalva (2), S. H. von Reuss (1), S. Chen (3), A. Koch (4), X. Wang (3), K. H. Kogel (4), P. W. Sternberg (5), V. M. Williamson (6), F. C. Schroeder (1), D. F. Klessig (1). (1) Boyce Thompson Institute for Plant Research, Cornell University, Ithaca, NY, U.S.A.; (2) University of California, Riverside, Riverside, CA, U.S.A.; (3) Cornell University, Ithaca, NY, U.S.A.; (4) Justus Liebig University, Giessen, Germany; (5) California Institute of Technology, Pasadena, CA, U.S.A.; (6) University of California, Davis, CA, U.S.A.

2:30 p.m. • 82-O
Determining *Heterodera glycines* HG Types to Improve Soybean Cyst Nematode Management in South Dakota. E. Byamukama (1), K. ACHARYA (1), G. L. Tylka (2). (1) South Dakota State University, Brookings, SD, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.

2:45 p.m. • 83-O
Identification and confirmation of root-knot nematode and Fusarium wilt disease resistance traits in cotton substitution lines. C. WANG (1), M. Ulloa (2), S. Saha (3), D. M. Stelly (4), J. N.

Jenkins (3), P. A. Roberts (5). (1) Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Harbin, China; (2) USDA-ARS, Plant Stress and Germplasm Development Research, Lubbock, TX, U.S.A.; (3) USDA-ARS, Genetics and Precision Agriculture Research, Mississippi State, MS, U.S.A.; (4) Texas A&M University, College Station, TX, U.S.A.; (5) University of California, Riverside, Riverside, CA, U.S.A.

3:00 p.m. • 84-O
Transcriptome analysis of resistant and susceptible alfalfa cultivars infected with root-knot nematode *Meloidogyne incognita*. O. A. Postnikova (1), M. Hult (2), J. Shao (1), A. Skantar (2), L. G. NEMCHINOV (1). (1) USDA ARS MPPL, Beltsville, MD, U.S.A.; (2) USDA ARS Nematology Lab, Beltsville, MD, U.S.A.

3:15 p.m. • 85-O
Interaction of nematicdes and biostimulants for nematode management on cucumbers and carrots. B. WESTERDAHL (1). (1) University of California, Davis, CA, U.S.A.

Virus-Host Interactions
2:15 p.m. - 3:30 p.m.; Ballroom H, CC
Moderators: Herman Scholthof, Texas A&M University, College Station, TX, U.S.A.; Alfredo Diaz Lara, Oregon State University, Corvallis, WA, U.S.A.

2:15 p.m. • 86-O
Differential gene expression in *Peregrinus maidis* after infection with *Maize mosaic virus*. K. M. MARTIN (1), K. Barandoc-Alviar (1), D. Rotenberg (1), A. E. Whitfield (1). (1) Kansas State University, Manhattan, KS, U.S.A.

2:30 p.m. • 87-O
Molecular and functional characterization of the movement protein of *Ourmia melon virus*. P. MARGARIA (1), C. T. Anderson (1), M. Turina (2), C. Rosa (1). (1) The Pennsylvania State University, University Park, PA, U.S.A.; (2) CNR, Torino, Italy

2:45 p.m. • 88-O
Elevated CO_2 increases wheat susceptibility to *Barley yellow dwarf virus*. P. TREBICKI (1), N. Nancarrow (2), A. Freeman (3), N. Bosque-Pérez (4), A. Yen (2), G. Fitzgerald (5). (1) Department of Economic Development, Horsham, , Australia; (2) Department of Economic Development, Bundoora, Australia; (3) Department of Economic Development, Horsham, Australia; (4) University of Idaho, Moscow, ID, U.S.A.; (5) Department of Economic Development, Ballarat, Australia

3:00 p.m. • 89-O
It's good to be green: A link between photosynthesis and polerovirus infection revealed by high-resolution mass spectrometry. S. L. DEBLASIO (1), R. Johnson (2), J. Chavez (2), M. Alexander (3), K. Parks (4), J. Ramsey (4), A. Karasev (5), S. M. Gray (6), J. E. Bruce (2), M. J. MacCoss (2), M. Cilia (7). (1) USDA-Agricultural Research Service; Boyce Thompson Institute for Plant Research, Ithaca, NY, U.S.A.; (2) Department of Genome Sciences, University of Washington, Seattle, WA, U.S.A.; (3) Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.; (4) Boyce Thompson Institute for Plant Research, Ithaca, NY, U.S.A.; (5) University of Idaho, Moscow, ID, U.S.A.; (6) USDA-Agricultural Research Service; Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.; (7) USDA-Agricultural Research Service; Boyce Thompson Institute for Plant Research; Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.

3:15 p.m. • 90-O
Role of *Wheat streak mosaic virus*-encoded proteins in disease development. S. TATINENI (1). (1) USDA ARS, Univ of Nebraska, Lincoln, NE, U.S.A.

WEDNESDAY MORNING, AUGUST 5

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/SCIPROGRAM/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.
Meeting room key: CC = Convention Center

Special Sessions

Buzzing the Tower: Unmanned Aerial Vehicles (UAV)/Drones for Applications in Plant Pathology
8:30 a.m. - 11:30 a.m.; Ballroom D, CC
Organizers/Moderators: Mathews Paret, University of Florida, Quincy, FL, U.S.A.; Jason Woodward, Texas A&M University, Lubbock, TX, U.S.A.
Section: Disease Control and Pest Management
Sponsoring Committees/Sponsors: Integrated Plant Disease Management; Extension

8:30 a.m. • 87-S
Drone-ing for plant pathogens in agricultural ecosystems. D. G. SCHMALE (1). (1) Virginia Tech, Blacksburg, VA, U.S.A.

9:00 a.m. • 88-S
A success story from 20 years of use of UAV (Yamaha RMAX) for crop dusting in Japan and experimentation in California grape production. K. GILES (1). (1) University of California, Davis, CA, U.S.A.

9:30 a.m. • 89-S
Autonomous aerial robots for precision farming. J. DAS (1). (1) GRASP Laboratory, University of Penn., Philadelphia, PA, U.S.A.

10:00 a.m. • Break

10:15 a.m. • 90-S
UAVs for orchard management: Prospects and procedures for aerial monitoring of plant health status in the Northeastern U.S. M. WALLHEAD (1), K. D. Broders (1). (1) University of New Hampshire, Durham, NH, U.S.A.

10:45 a.m. • 91-S
Development of a high-resolution remote sensing system for agricultural applications. D. HOLMAN (1), P. Gowda (2), M. Sridharan (3), D. Porter (4), T. Marek (5), J. Moorhead (2). (1) Texas A&M AgriLife Research, Lubbock, TX, U.S.A.; (2) USDA-ARS, Bushland, TX, U.S.A.; (3) University of Auckland, New Zealand; (4) Texas A&M AgriLife Extension Service, Lubbock, TX, U.S.A.; (5) Texas A&M AgriLife Research, Amarillo, TX, U.S.A.

11:15 a.m. • Discussion

(continued)

Climate Cycles, Climate Forecasting, and Disease Cycles Spanning Multiple Years

8:30 a.m. - 9:45 a.m.; Ballroom E, CC

Organizers: David Gent, USDA-ARS, Corvallis, OR, U.S.A.; Alissa Kriss, Syngenta, Greensboro, NC, U.S.A.
Moderator: David Gent, USDA-ARS, Corvallis, OR, U.S.A.
Section: Ecology and Epidemiology
Sponsoring Committees/Sponsors: Epidemiology; Crop Loss Assessment and Risk Evaluation (CLARE)
Financial Sponsors: Valent USA, Crop Loss Assessment and Risk Evaluation (CLARE) Committee

8:30 a.m. • 92-S
Weather prediction from climatology. G. H. TAYLOR (1). (1) Applied Climate Services, Corvallis, OR, U.S.A.

9:00 a.m. • 93-S
AgroClimate: Climate and weather information for monitoring and predicting strawberry disease risk in Florida. C. FRAISSE (1), N. Peres (1). (1) University of Florida, Gainesville, FL, U.S.A.

9:30 a.m. • 94-S
Use of climate patterns in prediction of *Fusarium* head blight epidemics. A. B. KRISS (1), P. A. Paul (2), L. V. Madden (2). (1) Syngenta, Greensboro, NC, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.

Contributions from Population Genomics to Plant Pathology

8:30 a.m. - 11:30 a.m.; Ballroom A, CC

Organizers: Niklaus Grunwald, USDA ARS, Corvallis, OR, U.S.A.; Richard Hamelin, Natural Resources Canada, Vancouver, BC, Canada
Moderators: Richard Hamelin, Natural Resources Canada, Vancouver, BC, Canada; Niklaus Grunwald, USDA ARS, Corvallis, OR, U.S.A.
Section: Ecology and Epidemiology
Sponsoring Committees/Sponsors: Evolutionary Genetics and Genomics; Molecular and Cellular Phytopathology

8:30 a.m. • 95-S
The changing landscape of sequencing technologies. I. GRIGORIEV (1). (1) US DOE Joint Genome Institute, Walnut Creek, CA, U.S.A.

9:00 a.m. • 96-S
Population genomics of emerging *Fusarium* disease of avocado. J. E. STAJICH (1), C. Fouet (2), E. Holmes (1), F. Na (1), B. White (2), A. Eskalen (1). (1) University of California, Department of Plant Pathology & Microbiology, Riverside, CA, U.S.A.; (2) University of California, Department of Entomology, Riverside, CA, U.S.A.

9:30 a.m. • 97-S
The making of a tree pathogen: Horizontal gene transfers, host jumps and speciation. R. C. HAMELIN (1), N. Feau (2), B. D. Dhillon (2), M. L. Sakalidis (2). (1) Natural Resources Canada, Vancouver, BC, Canada; (2) University of British Columbia, Vancouver, BC, Canada

10:00 a.m. • Break

10:45 a.m. • 98-S
Recombination hot spots in the genome of the wheat pathogen *Zymoseptoria tritici*. E. H. STUKENBROCK (1), J. Grandaubert (1), J. Y. Dutheil (1). (1) Max Planck Institute for Evolutionary Biology, Ploen, Germany

10:15 a.m. • 99-S
Pitfalls and potential of Population genomics. J. F. Tabima (1), B. J. Knaus (1), N. J. GRUNWALD (2). (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.

11:15 a.m. • Discussion

Physiological Basis and Modeling for Climate-Induced Changes in Forest Pathogens and Their Hosts

8:30 a.m. – 9:45 a.m.; Ballroom B, CC

Organizers: Jane Stewart, University of Georgia, Athens, GA, U.S.A.; Isabel Munck, U.S. Forest Service, Portsmouth, NH, U.S.A.
Moderators: Jason Smith, University of Florida, Gainesville, FL, U.S.A.; Jane Stewart, University of Georgia, Athens, GA, U.S.A.
Section: Diseases of Plants
Sponsoring Committees/Sponsors: Forest Pathology; Mycology; Epidemiology; Emerging Diseases and Pathogens

8:30 a.m. • 100-S
Emergence of a new disease, bur oak blight, with recent increases in spring rainfall. T. C. HARRINGTON (1), D. McNew (1). (1) Iowa State University, Ames, IA, U.S.A.

8:45 a.m. • 101-S
Differential fitness in ecotypes of the pitch canker pathogen: implications for climate change and forest health. T. QUESADA (1), J. A. Smith (1). (1) University of Florida, Gainesville, FL, U.S.A.

9:00 a.m. • 102-S
Ecology of Swiss needle cast in Western Oregon Coastal forests: ecophysiology and tree ring analysis correlate intensification to climate warming. D. C. SHAW (1). (1) Dept. of Forest Engineering, Resources, and Management, Oregon State University, Corvallis, OR, U.S.A.

9:15 a.m. • 103-S
Risk of forest diseases given climate change: Case study of *Phytophthora ramorum*. S. J. FRANKEL (1), R. C. Cobb (2). (1) USDA Forest Service, Pacific Southwest Research Station, Albany, CA, U.S.A.; (2) Department of Plant Pathology, UC Davis, Davis, CA, U.S.A.

9:30 a.m. • 104-S
Invasion biology of *P. cinnamomi*: Its impact and spread after its introduction over a century ago. Y. Balci (1), M. MCCONNELL (2). (1) University of Maryland, College Park, MD, U.S.A.; (2) Bartlett Tree Experts, Charlotte, NC, U.S.A.

Banana Production at the Crossroads: Impact of *Fusarium oxysporum* f.sp. *cubense* TR4

10:15 a.m. - 11:45 a.m.; Ballroom E, CC

Organizer/Moderator: Robert Kemerait, University of Georgia, Tifton, GA, U.S.A.
Section: Disease Control and Pest Management
Sponsoring Committees/Sponsors: Tropical Plant Pathology; Emerging Diseases and Pathogens; Diagnostics

10:15 a.m. • 105-S
Detection, identification and the epidemiology of *Fusarium oxysporum* f.sp. *cubense*, tropical race 4. G. H. KEMA (1), N. I. Ordonez (1), M. Salacinas (1), C. Schoen (1), O. Mendes (1), C. Waalwijk (1), M. F. Seidl (1), A. Drenth (2). (1) Wageningen University and Research Center, Wageningen, Netherlands; (2) The University of Queensland, Brisbane, Australia

10:45 a.m. • 106-S
The spread and impact of *Fusarium oxysporum* f.sp. *cubense*, tropical race 4 on global banana production. A. B. MOLINA (1), A. Viljoen (2), F. Dusunceli (3). (1) Bioversity International, Los Banos, Philippines; (2) Stellenbosch University, Stellenbosch,South Africa; (3) Food and Agriculture Organization (FAO) of the United Nations, Rome, Italy

11:15 a.m. • 107-S
Tropical race 4 of Panama disease threatens export and smallholder production of banana. R. C. PLOETZ (1). (1) University of Florida, Homestead, FL, U.S.A.

8:30 a.m. Technical Sessions

Agents for Biological Control

8:30 a.m. - 9:45 a.m.; Ballroom C, CC

Moderators: Ke Liu, Auburn University, Auburn, AL, U.S.A.; Kimberly Webb, USDA ARS NPA SBRU, Fort Collins, CO, U.S.A.

8:30 a.m. • 91-O
Piriformospora indica a possible biological control agent. M. RABIEY (1), M. W. Shaw (1). (1) University of Reading, Reading, United Kingdom

8:45 a.m. • 92-O
Control efficacy of an extract of cultured *Xylogone ganodermophthora* on powdery mildew caused by *Podosphaera xanthii* on watermelon in Korea. H. J. KANG (1), Y. Kim (1), T. Kim (1), C. U. Han (1), T. k. Jeong (1), S. Y. Nam (2). (1) Watermelon Research Institute CBARES, Eumseong-gun Chungcheongbuk-do, Korea; (2) Watermelon Research Institute CBARES, Eumseong-gun Chungcheongbuk-do, South Korea

9:00 a.m. • 93-O
Optimization of *Bacillus amyloliquefaciens* BAC03 Application in Controlling *Streptomyces scabies*. H. JIANG (1), Q. Meng (2), J. Hao (3). (1) Univ of Maine, Orono, ME, U.S.A.; (2) Univ of Maine, Spencer, IA, U.S.A.; (3) Univ of Maine, orono, ME, U.S.A.

9:15 a.m. • 94-O
Bacillus spp. evaluation to control anthracnose infection on Andean lupin seed (*Lupinus mutabilis* Sweet). V. d. R. YÁNEZ-MENDIZÁBAL (1), C. E. Falconí (2), A. C. Grijalva (1). (1) Universidad de las Américas, Quito, Ecuador; (2) Universidad de las Fuerzas Armadas -ESPE, Quito, Ecuador

9:30 a.m. • 95-O
Evaluation of endophytic bacteria against soybean rust fungus *Phakopsora pachyrhizi*. I. HAYATI (1), H. Marwan (1), S. Mulyati (1), M. Riyadi (1). (1) University of Jambi, Jambi, Indonesia

Emerging Viruses

8:30 a.m. - 9:45 a.m.; Ballroom F, CC

Moderators: Ana Cristina Fulladolsa, University of Wisconsin, Madison, U.S.A.; Zhongguo Xiong, University of Arizona, Tucson, AZ, U.S.A.

8:30 a.m. • 96-O
An outbreak of *Tomato chlorotic spot virus*, an emerging tospovirus threatening tomato production in the United States. S. ZHANG (1), D. R. Seal (1), Q. Wang (2), E. McAvoy (3), J. E. Polston (4). (1) TREC - Univ of Florida, Homestead, FL, U.S.A.; (2) UF/IFAS Miami-Dade County Extension, Homestead, FL, U.S.A.; (3) UF/IFAS Hendry County Extension, LaBelle, FL, U.S.A.; (4) Department of Plant Pathology, Univ of Florida, Gainesville, FL, U.S.A.

8:45 a.m. • 97-O
A new virus isolated from wild raspberry exhibiting leaf curl symptoms. A. DIAZ-LARA (1), J. Dittrich (2), K. E. Keller (2), R. R. Martin (3). (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS Horticultural Crops Research Unit, Corvallis, OR, U.S.A.; (3) USDA ARS, Corvallis, OR, U.S.A.

9:00 a.m. • 98-O
Emerging tomato viruses in Florida. I. E. Badillo-Vargas (1), C. A. Baker (2), G. Frantz (3), H. C. Mellinger (3), J. E. Funderburk (1), S. ADKINS (4). (1) UF-NFREC, Quincy, FL, U.S.A.; (2) FDACS-DPI, Gainesville, FL, U.S.A.; (3) Glades Crop Care, Inc., Jupiter, FL, U.S.A.; (4) USDA ARS USHRL, Fort Pierce, FL, U.S.A.

9:15 a.m. • 99-O
Detection of a New Luteovirus in Imported Nectarine Trees: A Case Study to Propose Adoption of Metagenomics in Post-entry Quarantine. S. BAG (1), M. Al Rwahnih (1), A. Li (2), A. Gonzalez (2), A. Rowhani (1), J. K. Uyemoto (2), M. R. Sudarshana (2). (1) University of California-Davis, Davis, CA, U.S.A.; (2) USDA-ARS, Davis, CA, U.S.A.

9:30 a.m. • 100-O
Detection and characterization of viruses in strawberry plants showing decline symptoms from eastern Canada. Y. XIANG (1), M. Bernardy (1), B. Bhagwat (1), R. DeYoung (1), M. Bouthillier (1). (1) Agriculture and Agri-Food Canada, Pacific Agri-Food Research Centre, Summerland, BC, Canada

Liberibacter-Session 1

8:30 a.m. - 9:45 a.m.; Ballroom G, CC

Moderators: Manisha Rath, USDA & UGA, Athens, GA, U.S.A.; Jianchi Chen, USDA ARS PWA, Parlier, CA, U.S.A.

8:30 a.m. • 101-O
Report of *Candidatus* Liberibacter caribbeanus, a new citrus- and psyllid-associated Liberibacter from Colombia, South America. M. L. KEREMANE (1), C. Ramadugu (2), A. Castaneda (3), J. E. Diaz (3), E. A. Peñaranda (3), J. Chen (4), Y. P. Duan (5), S. E. Halbert (6), R. F. Lee (7). (1) USDA ARS - Citrus Germplasm Repository, Riverside, CA, U.S.A.; (2) University of California Riverside, Riverside, CA, U.S.A.; (3) Instituto Colombiano Agropecuario, Bogota, Colombia; (4) USDA ARS, Parlier, CA, U.S.A.; (5) United States Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.; (6) Division of Plant Industry, Gainesville, FL, U.S.A.; (7) USDA ARS National Clonal Germplasm Repository for Citrus and Dates, Riverside, CA, U.S.A.

8:45 a.m. • 102-O
Differential response of citrus rootstock breeding lines to Huanglongbing-induced root loss. E. G. JOHNSON (1), J. H. Graham (1), J. W. Grosser (1). (1) University of Florida, Lake Alfred, FL, U.S.A.

9:00 a.m. • 103-O
The potential global climate suitability of Huanglongbing (HLB) and its vector (Asian citrus psyllid) using two correlative models. H. A. NAROUEI KHANDAN (1), S. Halbert (2), A. van Bruggen (1). (1) University of Florida, Gainesville, FL, U.S.A.; (2) Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL, U.S.A.

9:15 a.m. • 104-O
Induction of systemic acquired resistance against citrus Huanglongbing by exogenous application of functional analogs of salicylic acid. J. LI (1), P. Trivedi (1), N. Wang (1). (1) University of Florida, Lake Alfred, FL, U.S.A.

9:30 a.m. • 105-O
SC2 prophage encoded peroxidase (SC2_gp095) in *Candidatus* Liberibacter asiaticus is secreted and a likely virulence effector. M. JAIN (1), L. A. Fleites (1), D. W. Gabriel (1). (1) University of Florida, Gainesville, FL, U.S.A.

10:15 a.m. Technical Sessions

Biotrophic Virulence Discovery
10:15 a.m. - 11:30 a.m.; Ballroom B, CC

Moderators: Hannah Rivedal, Oregon State University, Corvallis, OR, U.S.A.; Jagdeep Kaur, Donald Danforth Plant Science Center, St. Louis , MO, U.S.A.

10:15 a.m. • 106-O
New approaches to phenotyping early time points of wheat stem rust infection process on barley. J. D. ZURN (1), S. Dugyala (1), P. Borowicz (1), R. Brueggeman (1), M. Acevedo (1). (1) North Dakota State University, Fargo, ND, U.S.A.

10:30 a.m. • 107-O
Apoplastic targeting of plant defensin MtDef4 confers strong resistance to leaf rust pathogen *Puccinia triticina* in transgenic wheat. J. KAUR (1), J. Fellers (2), T. Clemente (3), D. Shah (1). (1) Donald Danforth Plant Science Center, Saint Louis, MO, U.S.A.; (2) Dept. of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (3) Center for Biotechnology, University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

10:45 a.m. • 108-O
Discovery of effectors in the hop downy mildew pathogen *Pseudoperonospora humuli*. L. M. CANO (1), S. Withers (1), D. Gent (2), N. Noel (1), L. M. Quesada-Ocampo (1). (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.

11:00 a.m. • 109-O
Development of SP-SNP markers and use them to characterize populations of the stripe rust pathogen and identify markers associated to avirulence genes. C. XIA (1), M. Wang (1), A. Wan (1), X. Chen (2). (1) Washington State University, Pullman, WA, U.S.A.; (2) Washington State University; USDA-ARS, Wheat Genetics, Quality, Physiology, and Disease Research Unit, Pullman, WA, U.S.A.

11:15 a.m. • 110-O
Characterization of effector proteins of the soybean rust pathogen, *Phakopsora pachyrhizi*, that suppress plant immunity. M. QI (1), T. I. Link (2), R. T. Voegele (2), T. J. Baum (1), S. A. Whitham (1). (1) Iowa State University, Ames, IA, U.S.A.; (2) Institut für Phytomedizin, Universität Hohenheim, Stuttgart, Germany

Cultural Management of Plant Diseases
10:15 – 11:30 a.m.; Ballroom C, CC

Moderators: Claudio Vrisman, Ohio State University, Wooster, OH, U.S.A.; Ozgur Batuman, University of California, Davis, CA, U.S.A.

10:15 a.m. • 111-O
Anaerobic soil disinfestation disease control performance in strawberry as influenced by environmental variables. S. S. HEWAVITHARANA (1), C. Shennan (2), J. Muramoto (2), M. Mazzola (3). (1) Washington State University, Wenatchee, WA, U.S.A.; (2) University of California-Santa Cruz, Santa Cruz, CA, U.S.A.; (3) USDA ARS, Wenatchee, WA, U.S.A.

10:30 a.m. • 112-O
Postharvest quarantine treatments for *Diaphorina citri* on infested curry leaves. D. ANCO (1), G. Poole (2), T. Gottwald (3). (1) NCSU/USDA ARS, Fort Pierce, FL, U.S.A.; (2) UF, Fort Pierce, FL, U.S.A.; (3) USDA ARS, Fort Pierce, FL, U.S.A.

10:45 a.m. • 113-O
Gamma irradiation for management of post-harvest fruit rot of papaya caused by *Phytophthora palmivora*. M. A. DRAGICH (1), J. Uchida (1), L. Wong (2), C. Kadooka (1), K. Kamiya (3). (1) University of Hawaii at Manoa, Honolulu, HI, U.S.A.; (2) Pa'ina Hawaii LLC, Kunia, HI, U.S.A.; (3) Kamiya Gold Inc., Laie, HI, U.S.A.

11:00 a.m. • 114-O
Development of a sanitizing agent for use on field equipment to reduce the spread of olive knot in mechanized olive production in California. K. NGUYEN (1), H. Forster (1), J. Adaskaveg (1). (1) Department of Plant Pathology and Microbiology, University of California Riverside, Riverside, CA, U.S.A.

11:15 a.m. • 115-O
Application of anaerobic soil disinfestation in Florida; a brief review. E. N. ROSSKOPF (1), C. Shennan (2), N. Kokalis-Burelle (3), D. M. Butler (4), P. Serrano-Perez (5), M. d. Rodríguez-Molina (5), J. C. Hong (6). (1) USDA ARS, Ft Pierce, FL, U.S.A.; (2) University of California-Santa Cruz, Santa Cruz, CA, U.S.A.; (3) USDA, ARS, Fort Pierce, FL, U.S.A.; (4) University of Tennessee, Knoxville, TN, U.S.A.; (5) Centro de Investigaciones Científicas y Tecnológicas de Extremadura (CICYTEX), Badajoz, Spain; (6) USDA ARS, Fort Pierce, FL, U.S.A.

Disease Management
10:15 a.m. - 11:30 a.m.; Ballroom F, CC

Moderators: Zhen Fan, Clemson University, Clemson, SC, U.S.A.; Hamed Abbas, USDA ARS BCPRU, Stoneville, MS, U.S.A.

10:15 a.m. • 116-O
Application of bioplastic materials in the biocontrol of agricultural pests. H. K. ABBAS (1), C. Accinelli (2). (1) USDA ARS BCPRU, Stoneville, MS, U.S.A.; (2) University of Bologna, Dept of Agriculutural Sciences, Bologna, Italy

10:30 a.m. • 117-O
Effects of Clariva seed treatment on soybean cyst nematode (*Heterodera glycines)* population densities and soybean yields in Iowa in 2014. G. L. TYLKA (1), C. C. Marett (1), A. E. Robertson (1), M. Serrano (1), T. A. Mueller (2). (1) Iowa State University, Ames, IA, U.S.A.; (2) Iowa Soybean Association, Ankeny, IA, U.S.A.

10:45 a.m. • 118-O
A smartphone app for plant disease and fungicide resistance management. G. SCHNABEL (1), M. J. Hu (1), G. Edison (1), R. Pargas (1). (1) Clemson University, Clemson, SC, U.S.A.

11:00 a.m. • 119-O
The role of pest control advisors in managing grapevine trunk diseases: a survey of perceptions of practice efficacy and trends in recommendations. K. BAUMGARTNER (1), D. Doll (2), V. Hillis (3), J. Kaplan (4), M. Lubell (3). (1) USDA-Agricultural Research Service, Davis, CA, U.S.A.; (2) University of California Cooperative Extension, Merced, CA, U.S.A.; (3) Department of Environmental Science and Policy, University of California, Davis, CA, U.S.A.; (4) Department of Economics, California State University, Sacramento, CA, U.S.A.

11:15 a.m. • 120-O
Optimizing late blight forecasts for improved late blight management. I. M. SMALL (1), L. Joseph (1), Y. Wu (1), W. E. Fry (1). (1) Cornell University, Ithaca, NY, U.S.A.

Pathogen Detection Technologies-Session 2
10:15 – 11:15 a.m.; Ballroom G, CC

Moderator: Hung Doan, University of California, Davis, CA, U.S.A.

10:15 a.m. • 121-O
Early detection of Huanglongbing using mass spectrometry-based proteomics and machine learning. J. MOHR (1), J. Chavez (2), J. Ramsey (3), J. Mahoney (4), T. Thannhauser (5), K. Howe (5),

M. Alexander (1), K. Godfrey (6), E. Chin (6), C. Slupsky (6), J. Bruce (2), M. Cilia (5). (1) Cornell University, Ithaca, NY, U.S.A.; (2) University of Washington, Seattle, WA, U.S.A.; (3) Boyce Thompson Institute, Ithaca, NY, U.S.A.; (4) Boyce Thompson Institute, Ihtaca, NY, U.S.A.; (5) USDA-ARS, Ithaca, NY, U.S.A.; (6) UC Davis, Davis, CA, U.S.A.

122-O WITHDRAWN

10:30 a.m. • 123-O
Next Generation Sequencing for the optimal detection of viral pathogens in Grapevine. M. AL RWAHNIH (1), S. Daubert (2), D. Golino (1), A. Rowhani (1). (1) University of California-Davis. Department of Plant Pathology, Davis, CA, U.S.A.; (2) University of California, Department of Plant Pathology, Davis, CA, U.S.A.

10:45 a.m. • 124-O
Introducing molecular diagnostic technologies for detecting viruses in potato quarantine testing. H. XU (1), S. Cody (2), D. L. Hammill (2), X. Li (2). (1) Canadian Food Inspection Agency, Charlottetown Laboratory, Charlettetown, PE, Canada; (2) Canadian Food Inspection Agency, Charlottetown Laboratory, Charlottetown, PE, Canada

11:00 a.m. • 125-O
Developing a molecular diagnostic for *Fusarium oxysporum* f.sp. *cubense* tropical race 4 through Diversity Array Technology genotyping. N. I. ORDONEZ ROMAN (1), M. Salacinas (1), C. Schoen (1), O. Mendes (1), A. Kilian (2), G. Kema (1). (1) Wageningen University and Research, Wageningen, Netherlands; (2) Diversity Arrays Technology Pty Ltd, Canberra, Australia

WEDNESDAY AFTERNOON, AUGUST 5

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/SCIPROGRAM/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.
Meeting room key: CC = Convention Center

Special Sessions

APS-CSPP Joint Symposium on Plant Pathology and Disease Control

1:00 p.m. - 4:00 p.m.; Ballroom E, CC

Organizers/Moderators: Yulin Jia, USDA, Stuttgart, AR, U.S.A.; Guo-Liang Wang, The Ohio State University, Columbus, OH, U.S.A.
Section: Molecular/Cellular/Plant-Microbe Interactions
Sponsoring Committees/Sponsors: APS-CSPP Working Group; Virology

1:00 p.m. • 108-S
Engineered nucleases to combat virus infections. S. P. DINESH-KUMAR (1), . Fondong (2), D. Segal (3), B. Chan (1), E. Park (1). (1) University of California, Department of Plant Biology and The Genome Center, College of Biological Sciences, Davis, CA, U.S.A.; (2) Delaware State University, Department of Biological Sciences, Dover, DE, U.S.A.; (3) University of California, Deparmtment of Biochemistry and Molecular Medicine and The Genome Center, Davis, CA, U.S.A.

1:30 p.m. • 109-S
The resistance mechanisms of *Fusarium* graminearum to fungicides. Z. MA (1). (1) Zhejiang University, Hangzhou, China

2:00 p.m. • 110-S
The plant Mediator co-activator complex as an integrative hub for transcriptional regulation of jasmonate-signaled plant immunity. C. LI (1). (1) Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, Beijing, China

2:30 p.m. • Break

2:45 p.m. • 111-S
Aflatoxin production and environmental oxidative stress in *Aspergillus flavus*: Implications for host resistance. J. C. FOUNTAIN (1), L. Yang (1), P. Khera (2), R. C. Kemerait (1), R. D. Lee (1), B. T. Scully (3), R. K. Varshney (2), B. Guo (4). (1) University of Georgia, Tifton, GA, U.S.A.; (2) International Crop Research Institute for the Semi Arid Tropics, Hyderabad, India; (3) USDA-ARS, Fort Pierce, FL, U.S.A.; (4) USDA-ARS, Tifton, GA, U.S.A.

3:00 p.m. • 112-S
Identification of disease resistance genes for enhancement of existing potato cultivars. D. HALTERMAN (1). (1) USDA/ARS Vegetable Crops Research Unit, Madison, WI, U.S.A.

3:15 p.m. • 113-S
Progresses on pathogenesis and control of the rice false smut pathogen *Ustilaginoidea virens*. W. SUN (1), A. Fang (1), Y. Han (1), K. Zhang (1), Y. Zhang (1), N. Zhang (1), M. Wang (1). (1) China Agricultural University, Beijing, China

3:30 p.m. • 114-S
A novel tobacco RING E3 ligase NtRFP1 attenuates symptoms induced by a geminivirus-encoded ßC1 via mediating the ubiquitination and degradation of ßC1. Q. Shen (1), M. Bao (1), L. Cao (1), T. Hu (1), H. Zhang (2), C. Huang (1), X. Yang (3), F. Song (1), Q. Xie (2), X. ZHOU (3). (1) State Key Laboratory of Rice Biology, Institute of Biotechnology, Zhejiang University, Hangzhou, China; (2) State Key Laboratory of Plant Genomics, National Center for Plant Gene Research, Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, Beijing, China; (3) State Key Laboratory of Rice Biology, Institute of Biotechnology, Zhejiang University; State Key Laboratory for Biology of Plant Diseases and Insect Pests, Institute of Plant Protection, Chinese Academy of Agricultural Sciences, Beijing, China

Blocking the Transmission of Vector-Borne Plant Pathogens, Dream or Reality?

1:00 p.m. - 4:00 p.m.; Ballroom D, CC

Organizers: Rodrigo Almeida, University of California, Berkeley, CA, U.S.A.; Anna Whitfield, Kansas State University, Manhattan, KS, U.S.A.
Moderator: Rodrigo Almeida, University of California, Berkeley, CA, U.S.A.
Section: Ecology and Epidemiology
Sponsoring Committees/Sponsors: Vector-Pathogen Complexes; Virology

(continued)

1:00 p.m. • 115-S
Insights on virion retention (and inoculation): implications for reducing the whitefly transmission of foregut-borne criniviruses. J. NG (1). (1) University of California, Riverside, Riverside, CA, U.S.A.

1:30 p.m. • 118-S
Disrupting circulative virus transmission by blocking virus-vector interactions. A. E. WHITFIELD (1). (1) Kansas State University, Manhattan, KS, U.S.A.

2:00 p.m. • 117-S
The acrostyle in aphid stylets:an Achille's heel for virus transmission? M. UZEST (1). (1) National Institute for Agronomic Research (INRA), Montpellier, France

2:30 p.m. • Break

2:45 p.m. • 116-S
RNAi strategies targeting hemipteran vectors of plant pathogens. B. FALK (1), T. Pitman (1), Y. W. Kuo (1), S. Nouri (1), H. Wuriyanghan (2), C. Rosa (3), J. Warren (1). (1) University of California, Davis, CA, U.S.A.; (2) Inner Mongolia University, Hohot, China; (3) Pennsylvania State University, University Park, PA, U.S.A.

3:15 p.m. • 119-S
Blocking the vector transmission of non-circulative bacteria. R. ALMEIDA (1), N. Killiny (2), F. Labroussa (1). (1) Univ of California, Berkeley, CA, U.S.A.; (2) U Florida, Lake Alfred, FL, U.S.A.

3:45 p.m. • Discussion

Phytophthora tentaculata, A Newly Introduced Nursery Pathogen and How Clean Stock Production Systems Can Limit Disease Spread

1:00 p.m. - 4:00 p.m.; Ballroom A, CC

Organizer: Kathleen Kosta, California Dept. of Food and Agriculture, Sacramento, CA, U.S.A.
Moderators: Kathleen Kosta and Cheryl Blomquist, California Dept. of Food and Agriculture, Sacramento, CA, U.S.A.; David Rizzo, University of California at Davis, Davis, CA USA;
Section: Biology of Pathogens
Sponsoring Committees/Sponsors: Regulatory; Emerging Diseases and Pathogens; Diagnostics; Diseases of Ornamental Plants; Forest Pathology

1:00 p.m. • 120-S
Phytophthora tentaculata, a new *Phytophthora* species in the United States affecting California native plants, grown in nurseries. S. ROONEY-LATHAM (1), C. L. Blomquist (1), Y. Y. Guo (1), M. C. Soriano (1), K. L. Kosta (2), T. J. Swiecki (3), E. A. Bernhardt (3), S. J. Frankel (4). (1) California Department of Food and Agriculture, Sacramento, CA, U.S.A.; (2) California Dept of Food and Agriculture, Sacramento, CA, U.S.A.; (3) Phytosphere Research, Vacaville, CA, U.S.A.; (4) USDA Forest Service, Pacific Southwest Research Station, Albany, CA, U.S.A.

1:30 p.m. • 121-S
Phytophthora tentaculata and other *Phytophthora* species introduced into California native habitats via nursery stock. T. J. SWIECKI (1), E. Bernhardt (1), S. Rooney Latham (2), C. Blomquist (2), S. J. Frankel (3), K. Kosta (4). (1) Phytosphere Research, Vacaville, CA, U.S.A.; (2) California Department of Food and Agriculture, Sacramento, CA, U.S.A.; (3) USDA Forest Service, Pacific Southwest Research Station, Albany, CA, U.S.A.; (4) California Department of Food & Agriculture, Sacramento, CA, U.S.A.

1:45 p.m. • 122-S
Phytophthora tentaculata prioritized host range study for restoration nursery producers: CA native plants and woody perennials. K. SUSLOW (1), W. Schweigkofler (2), K. Kosta (3), T. Pastalka (2), S. Sharma (2). (1) National Ornamental Research Site @ Dominican University Program Manager, San Rafael, CA, U.S.A.; (2) NORS-DUC, San Rafael, CA, U.S.A.; (3) CDFA, Sacramento, CA, U.S.A.

2:00 p.m. • 123-S
New advances in molecular diagnostics for *Phytophthora tentaculata*. T. D. MILES (1), F. N. Martin (2). (1) California State University Monterey Bay, Seaside, CA, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.

2:15 p.m. • 124-S
Studies in the use of heat to control *Phytophthora tentaculata*. W. SCHWEIGKOFLER (1), K. Kosta (2), S. Sharma (1), A. Santiago (1), S. Ditta (1), V. Huffman (1), K. Suslow (1). (1) Dominican Univ of California, San Rafael, CA, U.S.A.; (2) California Department of Food & Agriculture, Sacramento, CA, U.S.A.

2:30 p.m. • Break

2:45 p.m. • 125-S
Implementing a systems approach of best management practices in native plant nurseries. K. L. KOSTA (1). (1) California Dept of Food and Agriculture, Sacramento, CA, U.S.A.

3:00 p.m. • 126-S
Evaluating the efficacy of the systems approach at mitigating five common pests in Oregon nurseries. N. K. OSTERBAUER (1), M. Lujan (1), G. McAninch (1), S. Lane (1), A. Trippe (2). (1) Oregon Department of Agriculture, Salem, OR, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.

3:15 p.m. • 127-S
A systems approach to nursery and greenhouse phytosanitary certification (SANC) for plant production facilities in the U.S. R. WELLIVER (1). (1) Pennsylvania Department of Agriculture, Harrisburg, PA, U.S.A.

3:30 p.m. • 128-S
P. *ramorum*: Successes, failures and lessons learned that can be applied to P. *tentaculata*. R. BULLUCK (1). (1) USDA APHIS PPQ CPHST, Raleigh, NC, U.S.A.
3:45 p.m. • Panel Discussion: How can we best stop the introduction and spread of new invasive pathogens in the nursery system? K. L. KOSTA (1). (1) California Dept. of Food and Agriculture, Sacramento, CA, U.S.A.

1:00 p.m. Technical Sessions

Bacterial Biology and Host Interactions

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

Moderator: Jingyu Peng, Louisiana State University, Baton Rouge, LA, U.S.A.

1:00 p.m. • 126-O
Contribution of type III-secreted effectors to virulence and host preferential association of *Acidovorax citrulli*. N. Eckshtain-Levi (1), M. Gershovits (2), B. Zhao (3), G. Welbaum (3), T. Pupko (2), R. Walcott (4), S. BURDMAN (1). (1) Hebrew University of Jerusalem, Rehovot, Israel; (2) Tel Aviv University, Tel Aviv, Israel; (3) Virginia Tech, Blacksburg, VA, U.S.A.; (4) University of Georgia, Athens, GA, U.S.A.

1:15 p.m. • 127-O
Untargeted metabolomic analysis reveals that the plant pathogenic bacterium *Ralstonia solanacearum* alters the composition of host

plant xylem fluid. T. M. LOWE (1), A. L. Jancewicz (1), B. L. Dalsing (1), P. H. Masson (1), C. Allen (1). (1) University of Wisconsin, Madison, WI, U.S.A.

1:30 p.m. • 128-O
Comparative transcriptomic analysis of *Burkholderia glumae* reveals the important role of *tepR* gene in regulating a multitude of cellular processes. J. PENG (1), J. H. Ham (1), S. Osti (1), I. K. Barphagha (1). (1) Louisiana State University, Baton Rouge, LA, U.S.A.

1:45 p.m. • 129-O
Protein expression profiling of *Rathayibacter toxicus* using mass spectrometry. C. M. FENNESSEY (1), J. Blanc (1), A. E. Sechler (1), J. G. King (1), M. McMahon (1), W. Garrett (2), D. G. Luster (1), W. L. Schneider (1). (1) USDA ARS, Frederick, MD, U.S.A.; (2) USDA ARS, Beltsville, MD, U.S.A.

2:00 p.m. • 130-O
Transcriptomic analyses of the interaction between *Rathayibacter toxicus* and phage CS14F. J. G. KING (1), A. Sechler (2), C. M. Fennessey (1), B. Atha (1), W. L. Schneider (1). (1) USDA ARS FDWSRU, Fort Detrick, MD, U.S.A.; (2) USDA ARS FDWSRU, Frederick, MD, U.S.A.

Etiology of Diseases Caused by Fungi and Oomycetes
1:00 p.m. - 2:15 p.m.; Ballroom C, CC
Moderator: Teresa Jardini, Washington State University, Pullman, WA, U.S.A.

1:00 p.m. • 131-O
Identifying and characterizing fungal pathogens causing seedling diseases on soybean through a multi-state survey. A. J. WARNER (1), E. Graves (1), T. Pojoski (1), J. Bond (1), A. Fakhoury (1). (1) Southern Illinois Univ, Carbondale, IL, U.S.A.

1:15 p.m. • 132-O
The interesting case of soybean seedborne *Fusarium* spp.: from identity to pathogenicity. R. Pedrozo (1), J. J. Fenoglio (1), C. R. Little (1), R. PEDROZO (1). (1) Kansas State University, Manhattan, KS, U.S.A.

1:30 p.m. • 133-O
Investigating *Alternaria* species composition and role in the potato early blight complex in Wisconsin. S. DING (1), K. Meinholz (1), A. J. Gevens (1). (1) UW-Madison, Madison, WI, U.S.A.

1:45 p.m. • 134-O
A survey of *Phytophthora* species causing root rot on *Abies* in U.S. Christmas tree farms. K. MCKEEVER (1), G. Chastagner (1). (1) Washington State University, Puyallup, WA, U.S.A.

2:00 p.m. • 135-O
Distribution and frequency of *Phytophthora* species causing brown rot of citrus in the Central Valley of California. W. HAO (1), T. D. Miles (2), F. N. Martin (2), H. Förster (1), J. E. Adaskaveg (1). (1) University of California, Riverside, CA, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.

Fungicide Resistance-Session 2
1:00 p.m. - 2:00 p.m.; Ballroom F, CC
Moderator: Stacey Haack, University of California, Riverside, CA, U.S.A.

1:00 p.m. • 136-O
Resistance in Strawberry Isolates of *Colletotrichum acutatum* from Florida to Quinone-outside Inhibitor Fungicides. B. B. FORCELINI (1), N. A. Peres (2), A. Amiri (2), T. E. Seijo (2). (1) Univ of Florida, Wimauma, FL, U.S.A.; (2) University of Florida, Wimauma, FL, U.S.A.

1:15 p.m. • 137-O
Baseline sensitivities of new fungicides against *Phytophthora* spp. causing brown rot and root rot of citrus. M. A. GRAY (1), W. Hao (2), H. Forster (3), J. E. Adaskaveg (2). (1) Univeristy of California, Riverside, Chatsworth, CA, U.S.A.; (2) University of California, Riverside, Riverside, CA, U.S.A.; (3) Univeristy of California, Riverside, Riverside, CA, U.S.A.

1:30 p.m. • 138-O
Fitness of tetraconazole-resistant isolates of *Cercospora beticola* after exposure to different temperature regimes. M. F. R. KHAN (1), S. Arabiat (2). (1) North Dakota State Univ & Univ of MN, Fargo, ND, U.S.A.; (2) North Dakota State University, Fargo, ND, U.S.A.

1:45 p.m. • 139-O
Baseline Sensitivity to Fluopyram and Fungicide Resistance Phenotypes of *Botrytis cinerea* Populations from Table Grapes in California. S. SAITO (1), M. J. Themis (2), C. L. Xiao (3). (1) USDA ARS, Parlier, CA, U.S.A.; (2) University of California-Davis, Kearney Agricultural Center, Parlier, CA, U.S.A.; (3) USDA Agricultural Research Service, Parlier, CA, U.S.A.

Host-Pathogen Interactions
1:00 p.m. - 2:15 p.m.; Ballroom G, CC
Moderator: Jose Pablo Dundore-Arias, University of Wisconsin, Madison, WI, U.S.A.

1:00 p.m. • 140-O
A *Fusarium fujikuroi* population isolated from grapes reveals the need to re-evaluate the species' fumonisin production potential. S. L. BOLTON (1), P. M. Brannen (1), A. E. Glenn (2). (1) Univ of Georgia, Athens, GA, U.S.A.; (2) USDA - ARS -TMRU, Athens, GA, U.S.A.

(continued)

1:15 p.m. • 141-O
Presence of *Salmonella enterica* in the alimentary canal of *Macrosteles quadrilineatus*, and role of *prgH* in persistence of the ingested bacteria. J. P. DUNDORE-ARIAS (1), R. L. Groves (2), J. D. Barak (2). (1) Univ of Wisconsin, Minneapolis, MN, U.S.A.; (2) Univ of Wisconsin, Madison, WI, U.S.A.

1:30 p.m. • 142-O
Variability in virulence as determined by honeydew production by strains of *Claviceps purpurea* (Fr.) Tul. on eight genotypes of wheat. 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

1:45 p.m. • 143-O
Endophyte community composition is associated with dieback occurrence in an invasive tree. T. V. STEINRUCKEN (1), A. Bissett (2), J. R. Powell (1), A. K. H. Raghavendra (3), R. D. van Klinken (3). (1) Hawkesbury Institute for the Environment, University of Western Sydney, Penrith NSW, Australia; (2) CSIRO Agriculture Flagship, Canberra, Australia; (3) CSIRO Biosecurity Flagship, Brisbane, Australia

2:00 p.m. • 144-O
Red Chili Pepper: Flavorant or health risk. P. SINGH (1), M. S. Islam (2), P. J. Cotty (1). (1) University of Arizona, Tucson, AZ, U.S.A.; (2) ARS, USDA, Tucson, AZ, U.S.A.

2:45 p.m. Technical Sessions

Chemical Management of Plant Diseases
2:45 p.m. – 4:00 p.m.; Ballroom B, CC
Moderators: Eduardo Chagas Silva, Louisiana State University, Baton Rouge, LA, U.S.A.; Norman Lalancette, Rutgers University, Bridgeton, NJ, U.S.A.

2:45 p.m. • 145-O
Control of the wheat curl mite, vector to *Wheat streak mosaic virus*, with pesticide applications on spring wheat. C. POL (1), M. Burrows (1), Z. Miller (2). (1) Montana State University, Bozeman, MT, U.S.A.; (2) Western Agricultural Research Center, Corvallis, MT, U.S.A.

3:00 p.m. • 146-O
Dormant treatments with chlorothalonil-oil delay the production of primary inoculum of almond scab caused by *Fusicladium carpophilum*. J. Adaskaveg (1), H. FORSTER (1). (1) University of California, Riverside, CA, U.S.A.

3:15 p.m. • 147-O
Contribution of mid-season cover sprays to management of peach brown rot at harvest. N. LALANCETTE (1), J. Gager (1), K. A. McFarland (1). (1) Rutgers University, Bridgeton, NJ, U.S.A.

3:30 p.m. • 148-O
The effect of adjuvants on apple disease management. C. P. ABBOTT (1), J. L. Beckerman (1). (1) Purdue University, West Lafayette, IN, U.S.A.

3:45 p.m. • 149-O
Trivapro: A new fungicide combining three different modes of action for disease control on corn, soybeans, and wheat. E. C. TEDFORD (1), A. Tally (2), A. Fisher (2). (1) Syngenta Crop Protection, Greensboro, NC, U.S.A.; (2) Syngenta Crop Protection, LLC, Greensboro, NC, U.S.A.

Fungal Epidemiology
2:45 p.m. – 4:00 p.m.; Ballroom C, CC
Moderator: Leilani Sumabat, University of Georgia, Athens, GA, U.S.A.

2:45 p.m. • 150-O
Three clonal lineages of the cocoa pathogen *Phytophthora megakarya* in Nigeria. O. O. Kolawole (1), E. M. GOSS (2). (1) University of Ibadan and Cocoa Research Institute of Nigeria, Ibadan, Nigeria; (2) University of Florida, Gainesville, FL, U.S.A.

3:00 p.m. • 151-O
Emergence of a new population of the select agent *Rathayibacter toxicus*. J. P. STACK (1), M. Arif (1), G. Y. Busot (1), R. Mann (2), B. Rodoni (2), S. Liu (1). (1) Kansas State Univ, Manhattan, KS, U.S.A.; (2) Victoria Department of Environment and Primary Industries, Bundoora, Australia

3:15 p.m. • 152-O
Host range and phylogenetic diversity of *Corynespora cassiicola*, cause of target spot of cotton in the southeastern USA. L. SUMABAT (1), R. Kemerait (2), M. T. Brewer (1). (1) University of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Tifton, GA, U.S.A.

3:30 p.m. • 153-O
Epidemiological Conditions Promoting Rhizopus Soft Rot and Fusarium Root Rot of Sweetpotato. A. C. SCRUGGS (1), L. M. Quesada-Ocampo (1). (1) North Carolina State University, Raleigh, NC, U.S.A.

3:45 p.m. • 154-O
Fusarium graminearum mycotoxin accumulation in wheat straw after anthesis in wheat cultivars ranging in susceptibility to Fusarium Head Blight. K. M. BISSONNETTE (1), K. A. Ames (1), Y. Dong (2), F. L. Kolb (1), C. A. Bradley (3). (1) University of Illinois, Urbana, IL, U.S.A.; (2) University of Minnesota, St. Paul, MN, U.S.A.; (3) Univ of Illinois, Urbana, IL, U.S.A.

Fungal Pathogens
2:45 p.m. – 4:00 p.m.; Ballroom F, CC
Moderators: Sebastian Albu, Louisiana State University, Baton Rouge, LA, U.S.A.; Randy Ploetz, University of Florida, Homestead, FL, U.S.A.

2:45 p.m. • 155-O
Screening avocado germplasm for resistance to laurel wilt. C. PISANI (1), M. A. Ritenour (2), E. Stover (3), R. C. Ploetz (4), D. N. Kuhn (5), O. A. Gutierrez (6). (1) Univ of Florida-Indian River Research Education Center, Fort Pierce, FL, U.S.A.; (2) University of Florida-Indian River Research Education Center, Fort Pierce, FL, U.S.A.; (3) USDA Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.; (4) University of Florida-Tropical Research Education Center, Homestead, FL, U.S.A.; (5) USDA- Subtropical Horticulture Research Station, Miami, FL, U.S.A.; (6) USDA-Subtropical Horticulture Research Station, Miami, FL, U.S.A.

3:00 p.m. • 156-O
Infection process of *Villosiclava virens* on rice. J. H. Song (1), C. LUO (1). (1) Huazhong Agricultural University, Wuhan, China

3:15 p.m. • 157-O
Not just *Botrytis*: multiple fungal pathogens cause leaf spots on peony in the United States. A. R. GARFINKEL (1), G. A. Chastagner (1). (1) Washington State University, Puyallup, WA, U.S.A.

3:30 p.m. • 158-O
Botrytis cinerea grows symptomlessly in host plants: How? C. J. EMMANUEL (1), J. A. van Kan (2), M. W. Shaw (3). (1) Department of Botany, University of Jaffna, Jaffna, Sri Lanka; (2) Laboratory of Phytopathology, Wageningen University, Wageningen, Netherlands; (3) School of Agriculture, Policy and Development, University of Reading, Reading, United Kingdom

3:45 p.m. • 159-O
Phylogenetically identified *Fusarium fujikuroi* associated with fusariosis of pineapple in peninsular Malaysia. L. ZAKARIA (1), N. F. Ibrahim (2), M. Mohd (2), N. M. Mohamed Nor (2). (1) Universiti Sains Malaysia, Minden, Penang, Malaysia; (2) Universiti Sains Malaysia, Minden, Malaysia

Liberibacter-Session 2
2:45 p.m. – 4:00 p.m.; Ballroom G, CC
Moderators: Kathleen McKeever, Washington State University, Puyallup, WA, U.S.A.; Manjunath Keremane, USDA ARS, Riverside, CA, U.S.A.

2:45 p.m. • 160-O
Citrus Huanglongbing tolerance in Australian Citrus Relatives, *Microcitrus* and *Eremocitrus*. C. RAMADUGU (1), M. L. Keremane (2), S. E. Halbert (3), E. Stover (4), D. G. Hall (5), G. T. McCollum (5), M. L. Roose (6), R. F. Lee (2). (1) Univ of California, Riverside, CA, U.S.A.; (2) USDA ARS National Clonal Germplasm Repository for Citrus and Dates, Riverside, CA, U.S.A.; (3) Division of Plant Industry, Gainesville, FL, U.S.A.; (4) United States Hortucultural Research Laboratory, Fort Pierce, FL, U.S.A.; (5) United States Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.; (6) University of California Riverside, Riverside, CA, U.S.A.

3:00 p.m. • 161-O
Characterization of Sec-translocon dependent extracytoplasmic proteins and essential signal peptidase I of *Candidatus* Liberibacter asiaticus. S. PRASAD (1), S. Prasad (1), N. Wang (1). (1) University of Florida, Lake Alfred, FL, U.S.A.

3:15 p.m. • 162-O
Candidatus Liberibacter asiaticus effector proteins localize in chloroplasts or mitochondria when expressed in plant cells. M. PITINO (1). (1) USDA ARS, Fort Pierce, FL, U.S.A.

3:30 p.m. • 163-O
Citrus root morphological changes caused by *Phytophthora spp.* and *Candidatus* Liberibacter spp. J. WU (1), E. G. Johnson (1), D. Bright (1), K. Gerberich (1), J. H. Graham (1). (1) University of Florida, Lake Alfred, FL, U.S.A.

3:45 p.m. • 164-O
Genetic diversity and pathogenesis of *Candidatus* Liberibacter asiaticus isolates. Y. DUAN (1), Y. Duan (1), B. WU (2), L. Zhou (2), E. Stover (2), R. Shatters (1). (1) USDA ARS USHRL, Fort Pierce, FL, U.S.A.; (2) USDA-ARS-USHRL, Fort Pierce, FL, U.S.A.

Scientific Posters

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POSTER VIEWING HOURS

Sunday, August 2

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

Monday, August 3

7:30 a.m. – 8:00 p.m. Poster Viewing
3:30 – 4:00 p.m. Poster Huddles*
- *HUDDLE #1* – How Do You Determine Which Microbes Have the Best Potential to Become a Successful Biological Control Agent?
  Moderator: Kimberly Webb
- *HUDDLE #2* – How Do You Develop a Screening Method to Identify Disease-Resistant Plants?
  Moderator: Emma Lookabaugh
- *HUDDLE #3* – What Types of Research Should be Prioritized When New Diseases Are Found?
  Moderator: Margaret McGrath
- *HUDDLE #4* – How Do You Decide on a Sampling Strategy to Determine the Spatial Distribution of a Pathogen?
  Moderator: Kim Zitnick-Anderson

4:00 – 6:00 p.m. Poster Viewing with Authors Present
If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.
4:00 – 5:00 p.m. Posters 1 – 403 *(even-numbered posters)*
5:00 – 6:00 p.m. Posters 404 – 807 *(even-numbered posters)*

Tuesday, August 4

7:30 a.m. – 6:00 p.m. Poster Viewing
3:30 – 4:00 p.m. Poster Huddles*
- *HUDDLE #5* – What are Nanoparticles and How Do They Impact Biological and Chemical Disease Control?
  Moderator: Richard Guenther
- *HUDDLE #6* – What are the Important Concepts Needed for Population Analyses?
  Moderator: Sydney Everhart
- *HUDDLE #7* – What are the Essential Factors Needed to Evaluate Disease Risk?
  Moderator: Ned Klopfenstein
- *HUDDLE #8* – Where are We in Finding Alternatives to Antibiotics for the Control of Bacterial Plant Diseases?
  Moderator: Kari Peter

4:00 – 6:00 p.m. Poster Viewing with Authors Present
If you are presenting two posters and they are scheduled during the same time period, please leave a note to indicate the other poster number where you can be found.
4:00 – 5:00 p.m. Posters 1 – 403 *(odd-numbered posters)*
5:00 – 6:00 p.m. Posters 404 – 807 *(odd-numbered posters)*

Wednesday, August 5

8:00 – 10:00 a.m. Poster Take-Down

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

POSTER CATEGORIES

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

Poster Categories	Poster Numbers
Bacteriology	1–26
Mycology	27-88
Nematology	89-103
Oomycetes	104-115
Virology	116-143
Postharvest Pathology and Mycotoxins	144-155
Biological Control	157-219
Chemical Control	220-294
Cultural Control	295-309
Genetics of Resistance	311-371
Integrated Pest Management	372-402
Regulatory Plant Pathology	403-406
Crop Loss Assessment	407-409
Disease Detection and Diagnosis	410-517
New and Emerging Diseases	518-572
Plant Stress and Abiotic Disorders	573-578
Analytical and Theoretical Plant Pathology	579-582
Cropping Systems/Sustainability	583-587
Pathogen Dispersal and Spatial/ Temporal Distribution	588-602
Pathogen-Vector Interactions	603-610
Population Biology	611-638
Rhizosphere	639-643
Risk Assessment	644-662
Systematics/Evolution	663-667
Biochemistry and Cell Biology	668-679
Molecular Aspects of Effectors and Their Host Targets	681-690
Molecular Plant-Microbe Interactions	691-736
Plant Defense Responses	737-756
Proteomics/Metabolomics/Genomics	757-793
Networking	794-795
Outreach and Engagement	796-801
Professional Development	802
Teaching and Learning	803-807

2015 APS Annual Meeting
August 1–5
Pasadena, California

Bacteriology

1-P Root infection of corn by *Clavibacter michiganensis* subsp. *nebraskensis.*

G. Mbofung (1), J. Sernett (2), A. E. ROBERTSON (3); (1) Iowa State University, Ames, IA, U.S.A.; (2) Monsanto, Huxley, IA, U.S.A.; (3) Iowa State Univ, Ames, IA, U.S.A.

2-P Identifying *Xanthomonas oryzae* pv. *oryzae* strains and adapted sources of resistance among rice breeding lines in Mali.

C. Tekete (1), H. Doucoure (2), M. Dembele (3), M. Doumbia (1), S. Dao (1), K. Dagno (4), S. Sarra (5), S. Cunnac (2), O. Koita (1), V. VERDIER (6); (1) Laboratoire de Biologie Moléculaire Appliquée, Université des Sciences Techniques et Technologiques de Bamako, Bamako, Mali; (2) IRD, UMR Interactions Plantes Microorganismes Environnement, IRD-Cirad-Université de Montpellier, Montpellier, France; (3) Institut d'Economie Rurale de Niono, Niono, Mali; (4) Institut d'Economie Rurale, Programme Sorgho-CRRA de Sotuba, Bamako, Mali; (5) Institut d'Economie Rurale de Niono,, Niono, Mali; (6) IRD, UMR Interactions Plantes Microorganismes Environnement, IRD-Cirad-Université de Montpellier, 34394 Montpellier Cedex 5, France

3-P Complete genome of the select agent *Rathayibacter toxicus* isolate SA03-04 from South Australia.

A. MOHAMMAD (1), G. Y. Busot (1), R. Mann (2), B. Rodoni (2), S. Liu (1), J. P. Stack (1); (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (2) Department of Primary Industries, La Trobe University, Bundoora, Australia

4-P Identification and functional characterization of bacterial community of tropical forage grasses *Brachiaria spp.* grown in their natural habitat.

S. GHIMIRE (1), C. Mutai (1), J. Njuguna (1), M. Ahonsi (1); (1) International Livestock Research Institute, Nairobi, Kenya

5-P *Phytophthora nicotianae* and huanglongbing cause different nutritional imbalances in grapefruit trees.

S. CHAUDHARY (1), M. Setamou (1), O. J. Alabi (2), J. L. Jifon (2), M. Kunta (1), K. Crosby (3), J. V. DaGraca (1), V. Ancona (1); (1) Texas A&M University-Kingsville Citrus Center, Weslaco, TX, U.S.A.; (2) Texas A&M University, Weslaco, TX, U.S.A.; (3) Texas A&M University, College Station, TX, U.S.A.

6-P Unraveling the citrus phytobiome: profiling endophytic microbes with potential to improve tolerance to plant diseases.

N. A. GINNAN (1), T. Dang (1), P. Ruegger (1), J. Borneman (1), P. E. Rolshausen (1), G. Vidalakis (1), C. Roper (1); (1) University of California, Riverside, Riverside, CA, U.S.A.

7-P Characterization of the structure and function of the microbiome in citrus rhizosphere.

U. HANDIQUE (1), Y. Zhang (2), N. Wang (2), J. W. Grosser (2); (1) university of florida, Lake Alfred, FL, U.S.A.; (2) University of Florida, Lake Alfred, FL, U.S.A.

8-P Fatty acid profiling to characterize California strains of *Xylella fastidiosa.*

C. WALLIS (1), J. Chen (1); (1) USDA ARS PWA, Parlier, CA, U.S.A.

9-P Whole genome sequencing and analyses of *Xylella fastidiosa* subsp. *fastidiosa* Strain GV156 causing Pierce's disease of grapevine in Taiwan.

C. C. Su (1), W. L. Deng (2), H. T. Shih (1), F. J. Jan (2), C. J. Chang (3), J. CHEN (4); (1) Taiwan Agricultural Chemicals and Toxic Substances Research Institute, Taichung, Taiwan; (2) Department of Plant Pathology, National Chung Hsing University, Taichung, Taiwan; (3) Department of Plant Pathology, University of Georgia, Griffin, GA, U.S.A.; (4) USDA ARS PWA, Parlier, CA, U.S.A.

10-P Effect of necrosis and crown gall caused by *Agrobacterium vitis* on graft take and root development of grapevines.

D. CANIK OREL (1), T. J. Burr (2); (1) Ankara University, Ankara, , Turkey; (2) Cornell University NYSAES, Geneva, NY, U.S.A.

11-P Diverse *Pseudomonas syringae* associated with foliar diseases of watermelon, cantaloupe, and squash.

E. A. NEWBERRY (1), M. L. Paret (2), C. T. Bull (3), J. B. Jones (4), B. Babu (5), E. M. Goss (4), I. Rubio (6), T. Jardini (7), P. Roberts (8); (1) University of Florida, Gainesville, FL, U.S.A.; (2) Department of Plant Pathology, North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.; (3) USDA ARS, Salinas, CA, U.S.A.; (4) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (5) Department of Pant Pathology, North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.; (6) California State University, Monterey Bay, CA, U.S.A.; (7) UC Davis, Davis, CA, U.S.A.; (8) Department of Plant Pathology, Southwest Florida Research and Education Center, University of Florida, Immokalee, FL, U.S.A.

12-P Genetic diversity of *Acidovorax citrulli* in Brazil.

G. M. SILVA (1), R. R. Walcott (2), R. M. Souza (1), F. H. Medeiros (1); (1) Federal University of Lavras, Lavras, Brazil; (2) The University of Georgia, Athens , GA, U.S.A.

13-P Oxytetracycline sensitivity in *Xanthomonas arboricola* pv. *pruni,* the causal agent of bacterial spot of stone fruit.

S. BARDSLEY (1), M. d. Jiménez-Gasco (2); (1) Penn State Univ, University Park, PA, U.S.A.; (2) Penn State University, University Park, PA, U.S.A.

14-P Characterization of *Pseudomonas syringae* from blueberry fields in Oregon and Washington.

V. STOCKWELL (1), B. T. Shaffer (2), R. Bennett (1), J. Lee (1), J. Loper (3); (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS, Corvallis, OR, U.S.A.; (3) USDA-ARS, Horticultural Crops Research Unit, Corvallis, OR, U.S.A.

15-P Phylogenetic analysis of the genus *Xanthomonas* by comparison of partial 23S ribosomal RNA gene sequences.

I. S. MYUNG (1), M. J. Yoon (1), J. Y. Lee (2), Y. K. Lee (2), H. Shim (2); (1) National Academy of Agricultrual Science, Wanju, South Korea; (2) NAAS, Wanju, South Korea

16-P Civitas affects in planta populations of bacterial endophytes, some of which can induce systemic resistance.

P. GOODWIN (1), W. Gao (2); (1) Univ of Guelph, Guelph, ON, Canada; (2) university of Guelph, Guelph, ON, Canada

17-P Changes in microbial communities associated with anaerobic soil disinfestation.

J. C. HONG (1), K. Martin (2), N. Kokalis-Burelle (3), D. Butler (4), P. Serrano-Perez (5), E. Rosskopf (3); (1) USDA ARS, Fort Pierce, FL, U.S.A.; (2) William Paterson University,, Wayne, NJ, U.S.A.; (3) USDA, ARS, Fort Pierce, FL, U.S.A.; (4) University of Tennessee, Knoxville, TN, U.S.A.; (5) Centro de Investigaciones Científicas y Tecnológicas de Extremadura (CICYTEX), Badajoz, Spain

18-P Draft genome sequence of a *Pantoea ananatis* strain associated with cotton bud/boll blight.

E. G. MEDRANO (1), w. mantooth (2), A. A. Bell (3); (1) USDA ARS CPRU, College Station, TX, U.S.A.; (2) usda.ars, college station, TX, U.S.A.; (3) USDA-ARS, College Station, TX, U.S.A.

19-P Inhibitory effects of D-Amino acids on Banana bacterial soft rot pathogen *Dickeya zeae* biofilm development.

B. Lin (1), J. ZHANG (1), N. Huang (1), H. Shen (1), X. Pu (1), D. Sun (1); (1) Key Laboratory of New Technique for Plant Protection in Guangdong, Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, Guangzhou, China

20-P Comparative genomics of 15 *Acidovorax* pathogens provide insights into the emergence of a new turfgrass disease and the host specificity of *Acidovorax*.

Q. ZENG (1), J. Wang (2), P. R. Giordano (3), F. Bertels (4), J. M. Vargas (2), G. W. Sundin (2), M. Chilvers (2), J. Jacobs (2), N. Dykema (2); (1) The Connecticut Agricultural Experiment Station, New Haven, CT, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.; (3) Bayer Corporation, Guelph, ON, Canada; (4) University of Basel, Zurich, Switzerland

21-P Effects of secondary contamination of pepper seeds by *Xanthomonas euvesicatoria* on pathogen distribution, incubation period and seedling transmission.

B. DUTTA (1), R. Gitaitis (2), S. Smith (2), D. Langston (3); (1) University of Georgia, Tifton, GA, U.S.A.; (2) University of Georgia, tifton, GA, U.S.A.; (3) Virginia Tech, Suffolk, VA, U.S.A.

(continued)

22-P Characterization of *Xanthomonas* spp. that cause bacterial spot of peppers in Oklahoma.
F. Cevallos (1), J. DAMICONE (2), C. Diaz (2); (1) Universidad de las Fuerzas Armadas, Sangolqui, Ecuador; (2) Oklahoma State University, Stillwater, OK, U.S.A.

23-P Characterization of potato pathogenic *Streptomyces* species present in Uruguay: emerging pathogens?
M. I. Lapaz (1), E. Verdier (2), M. I. Siri (1), J. Huguet-Tapia (3), R. Loria (3), M. J. PIANZZOLA (1); (1) Facultad de Química, Universidad de la República, Montevideo, Uruguay; (2) Ministerio de Agricultura y Pesca, Montevideo, Uruguay; (3) Plant Pathology Department, University of Florida, Gainesville, FL, U.S.A.

24-P Interaction of *Ralstonia solanacearum* and root-knot nematode on potato.
A. M. TOHAMY (1), M. A. Bekhiet (2), A. M. Kella (2); (1) Plant Pathology Research Insitute,, Giza, Egypt; (2) Plant Pathology Research Institute, Giza, Egypt

25-P Colonization of wild potato plants by *Streptomyces scabies*.
C. ALLEN (1), S. H. Jansky (2), A. O. Charkowski (3); (1) Univ of Wisconsin, Madison, WI, U.S.A.; (2) University of Wisconsin-Madison/USDA-ARS, Madison, WI, U.S.A.; (3) University of Wisconsin-Madison, Madison, WI, U.S.A.

26-P Investigation of the genes involved in the viable but nonculturable state in *Clavibacter michiganensis* subsp. *michiganensis*.
N. JIANG (1), S. Han (2), Q. Lv (2), R. Walcott (3), J. Li (2), L. Luo (2); (1) China Agricultural University, Athens, GA, U.S.A.; (2) China Agricultural University, Beijing, China; (3) The University of Georgia, Athens, GA, U.S.A.

Mycology

27-P Ploidy shift under high temperature and its effect on *Aspergillus flavus* ecology.
F. RUNA (1), I. Carbone (2), B. W. Horn (3), D. Bhatnagar (4), G. A. Payne (2); (1) California State University, Northridge, Northridge, CA, U.S.A.; (2) Department of Plant Pathology, North Carolina State University, Raleigh, NC, U.S.A.; (3) National Peanut Research Laboratory, USDA, ARS, Dawson, GA, U.S.A.; (4) Food and Feed Safety Research, Southern Regional Research Center, USDA, ARS, New Orleans, LA, U.S.A.

28-P A histological study of *Aspergillus flavus* colonization of wound inoculated corn kernels.
G. L. WINDHAM (1), W. P. Williams (1); (1) USDA ARS, Mississippi State, MS, U.S.A.

29-P Interspecific competition for colonization of maize host between *Fusarium proliferatum* and *Fusarium verticillioides*.
A. REYES GAIGE (1), J. P. Stack (1); (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.

30-P Molecular diversity of *Farium verticilloides* isolated from maize in three agro ecological zones of southwest Nigeria using AFLP marker.
O. m. OLOWE (1), A. C. Odebode (1), O. J. Olawuyi (1); (1) University of Ibadan, Ibadan, Nigeria

31-P Interactions between *Fusarium virguliforme* and other common fungal pathogens in soybean root rot complexes.
C. M. Floyd (1), D. M. MALVICK (2); (1) University of Minnesota, St Paul, MN, U.S.A.; (2) University of Minnesota, St. Paul, MN, U.S.A.

32-P Characterization and pathogenicity of *Rhizoctonia* spp. associated with soybean in Illinois.
O. O. AJAYI (1), C. A. Bradley (2); (1) Department of Crop Sciences, University of Illinois, Urbana, IL, U.S.A.; (2) Univ of Illinois, Urbana, IL, U.S.A.

33-P Association of genotype with phenotype in *Fusarium solani* from soybean.
P. CHITRAMPALAM (1), B. Nelson (2); (1) North Dakota State Univ., Fargo, ND, U.S.A.; (2) North Dakota State Univ, Fargo, ND, U.S.A.

34-P Pathogenicity of *Diaporthe* species infecting soybeans (*Glycine max* L.) in South Dakota.
P. Okello (1), A. Gebreil (1), T. Olson (1), B. Kontz (1), A. Micijevic (1), F. MATHEW (2); (1) South Dakota State University, Brookings, SD, U.S.A.; (2) South Dakota State Univ, Brookings, SD, U.S.A.

35-P Cercosporin concentration and fungal biomass suggest two modes of pathogenesis for *Cercospora kikuchii* in soybean.
E. C. SILVA (1), T. G. Garcia (2), A. V. Lygin (3), A. K. Chanda (4), C. L. Robertson (2), B. M. Ward (2), R. W. Scneider (2); (1) Louisiana State Univ, Agricultural Center, Baton Rouge, LA, U.S.A.; (2) Agcenter, Louisiana State University, Baton Rouge, LA, U.S.A.; (3) University of Illinois, Urbana, IL, U.S.A.; (4) University of Minnesota, Northwest Research and Outreach Center, Crookston, MN, U.S.A.

36-P Evaluation of cover crop susceptibility to *Fusarium virguliforme*, the causal agent of sudden death syndrome of soybean.
R. KOBAYASHI-LEONEL (1), D. S. Mueller (1), L. F. S. Leandro (1); (1) Iowa State University, Ames, IA, U.S.A.

37-P Effect of temperature and water potential on the hyphal growth rate of *Fusarium* and *Rhizoctonia* pathogens of wheat.
I. S. AUJLA (1), T. C. Paulitz (2); (1) Washington State University, Pullman, WA, U.S.A.; (2) USDA ARS, Pullman, WA, U.S.A.

38-P Studying aeciospores and survival of teliospores revealed no sexual reproduction of *Puccinia striiformis* f. sp. *tritici* in the Pacific Northwest.
M. WANG (1), A. Wan (1), X. Chen (2); (1) Washington State University, Pullman, WA, U.S.A.; (2) USDA ARS, Pullman, WA, U.S.A.

39-P An ecological study of endophytes from Mahonia aquafolium.
P. HATCH (1), B. Geary (1), C. R. Sweeney (1), T. Smart (1); (1) Brigham Young University, Provo, UT, U.S.A.

40-P Characterization of root associated and foliar fungal endophytes of winter wheat grass.
D. BOKATI (1), k. Craven (1), B. Prithiviraj (1), M. H. Chi (1); (1) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.

41-P Unexpected diversity of rust fungi on *Panicum*: identification of four species infecting switchgrass.
J. DEMERS (1), L. Castlebury (2); (1) USDA ARS, Beltsville, MD, U.S.A.; (2) USDA-ARS, Beltsville, MD, U.S.A.

42-P Etiology and management of *Fusarium spp.* causing cryptic cankers in cold-stored, bare-root propagated almond seedlings.
J. SEIDLE (1), T. R. Gordon (2), R. M. Bostock (2); (1) University of California, Davis, Sacramento, CA, U.S.A.; (2) University of California, Davis, Davis, CA, U.S.A.

43-P WITHDRAWN

44-P Diversity of endophytic fungi from *Cirsium kawakamii* and the risk assessment.
C. HUI-JUAN (1), C. Wen-Hsin (1); (1) Dept. of Plant Pathology, National Chung Hsing University, Taichung, Taiwan

45-P WITHDRAWN

46-P Potentially-toxigenic and spoilage postharvest fungi from pome and stone fruits.
V. H. TOURNAS (1), J. S. Kohn (2), E. J. Katsoudas (2); (1) Center for Food Safety and Applied Nutrition/FDA, College Park, MD, U.S.A.; (2) Northeast Regional Lab/ORA/FDA, Jamaica, NY, U.S.A.

47-P Etiological and genetic characteristics of fruit spot disease in apple caused by *Colletotrichum gloeosporioides* based on morphology and pathogenicity.
W. CHEON (1), Y. Jeon (1); (1) Andong National University, Andong, South Korea

48-P Findings on the life cycle and biology of *Botrytis cinerea* causing cane botrytis on red raspberries in the Pacific Northwest.
L. A. JONES (1), J. W. Pscheidt (1); (1) Oregon State University, Corvallis, OR, U.S.A.

49-P Germination parameters and qPCR quantification of pycnidiospores of *Phyllosticta citricarpa, the* causal agent of citrus black spot.
M. KELLERMAN (1), G. Van Zyl (1), M. M. Dewdney (2), A. McLeod (3), P. H. Fourie (4); (1) Citrus Research International/Stellenbosch University, Stellenbosch, South Africa; (2) Univ of Florida, Lake Alfred, FL, U.S.A.; (3) Stellenbosch University, Stellenbosch, South Africa; (4) Citrus Research International/Stellenbosch University, Nelspruit, South Africa

50-P Wood-decay abilities of grapevine trunk pathogens *Diaporthe ampelina, Diplodia seriata*, *Eutypa lata*, and *Neofusicoccum parvum*.
E. GALARNEAU (1), C. Wallis (2), A. Morales-Cruz (3), D. Cantu (3), K. Baumgartner (4); (1) USDA ARS CPGRU, Davis, CA, U.S.A.; (2) USDA ARS, Parlier, CA, U.S.A.; (3) University of California Davis, Davis, CA, U.S.A.; (4) USDA-Agricultural Research Service, Davis, CA, U.S.A.

51-P Xylem vessels diameter affects resistance to the vascular fungal pathogen *Phaeomoniella chlamydospora* in grapevine.
J. POUZOULET (1), E. Scudiero (1), P. E. Rolshausen (1); (1) University of California Riverside, Riverside, CA, U.S.A.

52-P Frequency of pathogenic fungi isolated from symptomatic grapevines in California.
J. Monis (1), L. A. MILIES (2), M. Vernon (1); (1) Eurofins/STA Laboratories Inc, Gilroy, CA, U.S.A.; (2) Eurofins STA Laboratories, Gilroy, CA, U.S.A.

53-P Etiology and management strategies for sour rot on grapes.
M. E. HALL (1), G. M. Loeb (2), W. F. Wilcox (2); (1) Cornell Univ, Geneva, NY, U.S.A.; (2) Cornell University, Geneva, NY, U.S.A.

54-P Population structure and host preference of *Macrophomina phaseolina* on strawberry.
F. N. MARTIN (1), S. T. Koike (2), R. Arias (3), M. L. Ramon (4); (1) USDA ARS, Salinas, CA, U.S.A.; (2) Cooperative Extension Monterey County, Salinas, CA, U.S.A.; (3) USDA-ARS, Dawson, GA, U.S.A.; (4) USDA_ARS, Salinas, CA, U.S.A.

55-P Laurel wilt of avocado: Epidemiology and management of a recalcitrant disease of an important crop.
R. PLOETZ (1), D. Carrillo (2); (1) Univ of Florida, Homestead, FL, U.S.A.; (2) Univ Florida, Homestead, FL, U.S.A.

56-P Factors affecting cotyledon inoculation on lima bean stem nlight caused by *Botryodiplodia theobromae.*
C. H. KUO (1), W. H. Hsieh (2); (1) National Chiayi University, Chiayi, Taiwan; (2) National Chung-Hsing University, Taichung, Taiwan

57-P Characterization of the ITS region of isolates of race 65 of *Colletotrichum lindemuthianum* collected in different states of Brazil.
M. C. Gonçalves-Vidigal (1), M. Coelho (2), R. F. AZEVEDO (1), L. L. Sousa (1), M. Z. Galván (3), M. c. Gonçalves-Vidigal (1); (1) Universidade Estadual de Maringá, Maringá, Brazil; (2) Universidade Estadual de Maringá, Maringa, Brazil; (3) CONICET, Biotecnología, INTA EEA Salta, Salta, Argentina

58-P WITHDRAWN

59-P Association of *Phomopsis longicolla* and *Macrophomina phaseolina* with zone lines in soybean roots at maturity.
M. L. ZACCARON (1), R. T. Holland (1), T. J. Hughes (2), C. R. Grau (3), J. C. Rupe (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) Monsanto Co, Chesterfield , MO, U.S.A.; (3) University of Wisconsin, Madison, WI, U.S.A.

60-P Association of fungal effectors with pathogenicity of *Fusarium oxysporum* isolates on soybean.
M. L. ELLIS (1), A. Lanubile (2), C. Garcia (1), G. P. Munkvold (3); (1) California State University, Fresno, Fresno, CA, U.S.A.; (2) Università Cattolica del Sacro Cuore, Piacenza, Italy; (3) Iowa State Univ, Ames, IA, U.S.A.

61-P Limited host range of *Sclerotiorum trifoliorum* relative to *S. sclerotiorum* examined using comparative pathogenicity tests and transcriptomics.
T. M. JARDINI (1), D. Qiu (1), W. Chen (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.

62-P Identification and management alternatives of powdery mildew in rosebushes (*Rosa* sp.).
R. GARCÍA-VELASCO (1), D. Dominguez-Serrano (1), M. E. Mora-Herrera (1), J. G. Gonzalez-Diaz (1), M. L. Salgado-Siclan (2), D. Nieto-Angel (3); (1) Autonomous University of the State of Mexico, Tenancingo, Mexico; (2) Autonomous University of the State of Mexico, Toluca, Mexico; (3) Postgraduate College, Texcoco, Mexico

63-P Mining the *Uromyces transversalis* genome for molecular markers to investigate genetic diversity of the quarantine significant *Gladiolus* rust fungus.
J. DELONG (1), J. Buck (2), K. Pedley (3), J. Stewart (1), M. Brewer (1); (1) University of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Griffin, GA, U.S.A.; (3) United States Department of Agriculture, Fort Detrick, MD, U.S.A.

64-P Host range testing and molecular analysis of *Puccinia psidii* in Hawaii.
J. UCHIDA (1), C. kadooka (1); (1) Univ of Hawaii At Manoa, Honolulu, HI, U.S.A.

65-P Assessment of *Calonectria pseudonaviculata* microsclerotia survival in compost over varying times and temperatures.
R. HARVEY (1), J. Pecchia (2), D. Davis (2); (1) Penn State University, State College, PA, U.S.A.; (2) Penn State University, University Park, PA, U.S.A.

66-P Effects of inoculum concentration, temperature, and interrupted wetness periods on infection of boxwood by *Calonectria pseudonaviculata.*
H. F. AVENOT (1), T. P. Edwards (1), A. Baudoin (1), C. Hong (2); (1) Virginia Tech, Blacksburg, VA, U.S.A.; (2) Virginia Polytechnic Institute and State University, Virginia Beach, VA, U.S.A.

67-P *Fusarium* species reduce plant stand and biomass yield of switchgrass.
S. B. COLLINS (1), M. M. Dee (1), K. D. Gwinn (1), B. H. Ownley (1); (1) University of Tennessee, Knoxville, TN, U.S.A.

68-P Host specificity of *Corynespora cassiicola* causing target spot on blueberry and tomato in Florida.
R. B. ONOFRE (1), G. Vallad (2), N. A. Peres (2); (1) University of Florida - Gulf Cost REC, Wimauma, FL, U.S.A.; (2) University of Florida, Wimauma, FL, U.S.A.

69-P Detached leaf culture technique for the study of switchgrass rust.
G. ORQUERA (1), C. Garzón (1), S. Marek (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.

70-P Susceptibility of weed hosts and crops to host-adapted pathotypes of *Verticillium dahlia.*
Z. FREDERICK (1), T. Cummings (1), D. Johnson (1); (1) Washington State University, Pullman, WA, U.S.A.

71-P Defining the host range of the switchgrass rust fungus, *Puccinia emaculata*.
B. Johnson (1), G. ORQUERA (1), C. Garzón (1), S. Marek (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.

72-P Cryptic sex in the laurel wilt pathogen, *Raffaelea lauricola,* and sexual states in three other closely related ambrosia beetle symbionts.
C. E. WUEST (1), T. C. Harrington (2), D. L. McNew (1), S. W. Fraedrich (3); (1) Iowa State University, Ames, IA, U.S.A.; (2) Department of Plant

(continued)

Pathology and Microbiology, Ames, IA, U.S.A.; (3) USDA Forest Service, Athens, GA, U.S.A.

73-P Quantification and determination of inoculum threshold levels of *Fusarium commune* in Douglas-fir nurseries.
A. L. Leon (1), K. P. Coats (2), G. A. CHASTAGNER (2); (1) Weyerhaeuser, Federal Way, WA, U.S.A.; (2) Washington State University, Puyallup, WA, U.S.A.

74-P *Phomopsis* associated with spruce decline: Virulence studies on six spruce species.
C. K. MCTAVISH (1), D. W. Fulbright (1), A. M. Jarosz (1); (1) Michigan State University, East Lansing, MI, U.S.A.

75-P Characterization of *Phomopsis* isolated from spruce exhibiting spruce decline symptoms.
C. K. MCTAVISH (1), D. W. Fulbright (1), A. M. Jarosz (1); (1) Michigan State University, East Lansing, MI, U.S.A.

76-P Cacao black pod and wilt control research.
G. SCHIERMAN (1), J. Uchida (2), C. Y. Kadooka (2); (1) PEPS, Honolulu, HI, U.S.A.; (2) University of Hawaii at Manoa, Honolulu, HI, U.S.A.

77-P Virulence and secondary metabolite profiles of vascular competent and vascular incompetent pathotypes of *Fusarium oxysporum* f. sp. *Vasinfectum*.
J. LIU (1), A. A. Bell (1), R. L. Nichols (2); (1) USDA ARS, College Station, TX, U.S.A.; (2) Cotton Incorporated, Cary, NC, U.S.A.

78-P Assessment of endophyte recovery in rubber trees: Culture vs. metagenomics approaches.
D. SKALTSAS (1), L. A. Castlebury (2), P. Chaverri (1); (1) University of Maryland, College Park, MD, U.S.A.; (2) USDA ARS Systematic Mycology & Microbiology Lab, Beltsville, MD, U.S.A.

79-P Diversity of *Sclerotinia sclerotiorum* isolates collected from Bangladesh and Ohio, USA.
M. M. ISLAM (1), S. A. Miller (2); (1) The Ohio State Univ, Wooster, OH, U.S.A.; (2) The Ohio State University OARDC, Wooster, OH, U.S.A.

80-P Virulence assessment of representative isolates of the *Phytophthora cinnamomi* population in California on different avocado rootstock selections.
B. McKee (1), M. Crowley (1), J. Mayorquin (1), G. Douhan (1), M. L. Arpaia (1), A. Eskalen (1), P. MANOSALVA (1); (1) University of California Riverside, Riverside, CA, U.S.A.

81-P Detached-leaf assay for assessing variation in pathogenicity of the sugarcane orange rust pathogen (*Puccinia kuehnii*) in Florida.
M. HINCAPIE (1), C. Lopez Ramos (2), A. Jameson (1), R. N. Raid (1), S. Sood (3), J. C. Comstock (3), P. Rott (1); (1) University of Florida, Belle Glade, FL, U.S.A.; (2) Escuela agricola panamericana Zamorano, Tegucigalpa, Honduras; (3) United States Department of Agriculture, Agricultural Research Service, Canal Point, FL, U.S.A.

82-P Pathogenicity and phylogenetics of the celery anthracnose pathogen, *Colletotrichum fioriniae* (= *C. acutatum sensu lato*).
J. PAVEL (1), B. Liu (1), C. Feng (1), J. C. Correll (1), S. R. May (2), B. K. Gugino (2), M. del Mar Jimenez-Gasco (2), M. K. Hausbeck (3), R. N. Raid (4), S. T. Koike (5); (1) Dept. Plant Pathology, University of Arkansas, Fayetteville, AR, U.S.A.; (2) Dept. of Plant Pathology and Environmental Microbiology, Pennsylvania State University, State College, PA, U.S.A.; (3) Dept. of Plant, Soil, and Microbial Sciences, Michigan State University, East Lansing, MI, U.S.A.; (4) Dept. of Plant Pathology, University of Florida, Belle Glade, FL, U.S.A.; (5) University of California Cooperative Extension, Salinas, CA, U.S.A.

83-P Analysis of a MULE-cyanide hydratase gene fusion in *Verticillium dahlia*.
Z. LI (1), A. Anchieta (2), S. J. Klosterman (3); (1) Cotton Research Institute, Anyang, China; (2) USDA-ARS, Salinas, CA, U.S.A.; (3) USDA ARS, Salinas, CA, U.S.A.

84-P Is there local adaptation to temperature in *Phytophthora infestans*?
N. MARIETTE (1), A. Androdias (1), R. Mabon (1), R. Corbière (1), J. Montarry (1), D. Andrivon (1); (1) INRA IGEPP, Le Rheu, France

85-P Morphological, cultural, pathogenic and genetic characteristics of *Macrophomina phaseolina*, causer of sugar beet charcoal root rot.
D. BUDAKOV (1), N. Nagl (2), V. Stojšin (1), K. Taški-Ajdukovic (2), F. Bagi (1), O. T. Neher (3); (1) University of Novi Sad, Faculty of Agriculture, Department for environmental and plant protection, Novi Sad, Serbia; (2) Institute for field and vegetable crops, Novi Sad, Serbia; (3) The Amalgamated Sugar Company LLC, Boise, ID, U.S.A.

86-P Pathogenicity, vegetative compatibility, and genetic diversity in *Verticillium dahliae* from sugar beet and historical strains.
C. A. STRAUSBAUGH (1), I. A. Eujayl (2), F. N. Martin (3); (1) USDA ARS NWISRL, Kimberly, ID, U.S.A.; (2) USDA-ARS NWISRL, Kimberly, ID, U.S.A.; (3) USDA-ARS, Salinas, CA, U.S.A.

87-P Ultraviolet action spectrum against *Oidium neolycopersici*, the cause of powdery mildew in tomato.
S. ARUPPILLAI (1), S. Arne (2), S. A. Knut (3), G. R. Hans (1); (1) Department of Plant Sciences, Norwegian University of Life Sciences, Aas, Norway; (2) Bioforsk, Norwegian Institute for Agricultural and Environmental Research, Aas, Norway; (3) Department of Ecology and Natural Resource Management, Norwegian University of Life Sciences, Aas, Norway

88-P Cultural, morphological and molecular diversity among *Stemphylium lycopersici* isolates causing tomato gray leaf spot in Argentina.
M. E. Franco (1), J. Vera Bahima (2), B. L. Ronco (2), M. C. Saparrat (3), P. BALATTI (4); (1) Centro de Investigaciones de Fitopatología Facultad de Ciencias Agrarias y Forestales Universidad Nacional de La Plata, LaPlata, Argentina; (2) Centro de Investigaciones de Fitopatología Facultad de Ciencias Agrarias y Forestales Universidad Nacional de La Plata, La Plata, Argentina; (3) Instituto Carlos Spegazzini, Facultad de Ciencias Naturales y Museo. La Plata, Buenos Aires, Argentina, La Plata, Argentina; (4) Univ Nacl de la Plata, La Plata, Argentina

Nematology

89-P Yield response and cotton root knot nematode control with seed treatment and granular nematicides on corn.
A. K. HAGAN (1), L. Campbell (2); (1) Auburn Univ, Auburn, AL, U.S.A.; (2) Auburn University, Auburn, AL, U.S.A.

90-P The profile of GHF5 and GHF45 cellulases in 14 *Aphelenchoides besseyi* isolates orginated from different hosts.
G. WU (1), P. J. Chen (1); (1) Natl Chung Hsing Univ, Taichung, Taiwan

91-P Effects of ILeVO and VOTiVO seed treatments on hatching, motility and root penetration of the soybean cyst nematode.
A. BEEMAN (1), G. L. Tylka (1); (1) Iowa State University, Ames, IA, U.S.A.

92-P Management of blueberry, *Vaccinium* spp. replant disease with pine bark soil amendment and pre-plant fumigation.
J. P. Noe (1), G. B. JAGDALE (2), W. T. Holladay (1), P. M. Brannen (1); (1) University of Georgia, Athens, GA, U.S.A.; (2) Univ of Georgia, Athens, GA, U.S.A.

93-P Improving crop rotation efficiency for soybean cyst nematode management.
R. MEDINA (1), C. G. Taylor (1); (1) Ohio State University, OARDC, Wooster, OH, U.S.A.

94-P Optimizing extraction to detect plant pathogenic and non-pathogenic nematodes of regulated palm weevils.
L. CARTA (1), S. Li (2); (1) USDA ARS, Beltsville, MD, U.S.A.; (2) USDA-ARS Nematology Laboratory, Beltsville, MD, U.S.A.

95-P Evaluation of plant hormones and starter fertilizers on plant development in the presence of *M. incognita* or *R. reniformis*.
J. A. LUANGKHOT (1), K. S. Lawrence (2), A. L. Smith (2); (1) Auburn Univ, Auburn, AL, U.S.A.; (2) Auburn University, Auburn, AL, U.S.A.

96-P Reproduction of *Meloidogyne incognita* and *Rotylenchulus reniformis* on select cotton cultivars.
J. E. WOODWARD (1), T. A. Wheeler (2); (1) Texas A&M AgriLife Extension Service, Lubbock, TX, U.S.A.; (2) Texas A&M AgriLife Research, lubbock, TX, U.S.A.

97-P Differential effects on nematode development of two QTLs for resistance to *Meloidogyne incognita* in cotton.
M. BATISTA DA SILVA (1), P. Kumar (1), P. Ji (1), P. W. Chee (1), R. Davis (2); (1) University of Georgia, Tifton, GA, U.S.A.; (2) USDA-ARS, Tifton, GA, U.S.A.

98-P Efficacy of seed-applied nematicides on the management of the reniform nematode (*Rotylenchulus reniformis*) in cotton.
S. KAKAIRE (1), T. W. Allen (2), B. R. Golden (1); (1) Mississippi State University, Stoneville, MS, U.S.A.; (2) Mississippi State Univ, Stoneville, MS, U.S.A.

99-P Manipulation of amino acid gradients reduces root-knot nematode penetration of roots.
T. S. FREY (1), K. Navarro (2), G. Valero (3), C. G. Taylor (2); (1) Ohio State Univ, Wooster, OH, U.S.A.; (2) Ohio State University, Wooster, OH, U.S.A.; (3) University of Puerto Rico, Mayaguez, Mayaguez, U.S.A.

100-P Barriers to movement and spread of *Radopholus similis* in Anthurium.
B. SIPES (1), R. Myers (2), J. Lichty (3), K. Sewake (3); (1) Univ of Hawaii At Manoa, Honolulu, HI, U.S.A.; (2) USDA ARS PBARC, Hilo, HI, U.S.A.; (3) Univ of Hawaii At Manoa, Hilo, HI, U.S.A.

101-P Spring and fall structure and dynamics of nematode trophic groups among organically and conventionally managed golf courses.
E. ALLAN (1), D. Manter (2), G. Jung (3); (1) Univ 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.

102-P Investigation of the potential disease complex concerning *Pythium aphanidermatum* and *Meloidogyne incognita* on cucumber.
K. A. MORRIS (1); (1) University of Georgia, Tifton, GA, U.S.A.

103-P Transmission of root-knot nematodes, *Meloidogyne hapla* and *Meloidogyne incognita*, to tomato by *Helix aspersa*.
K. R. SANCHEZ (1), E. P. Caswell-Chen (2); (1) Univ of California, Davis, CA, U.S.A.; (2) University of California, Davis, CA, U.S.A.

Oomycetes

104-P *Pythium* species from Minnesota soybean fields, their relative pathogenicity to soybeans and corn, and their sensitivity to seed treatment fungicides.
L. RADMER (1), G. Anderson (1), D. M. Malvick (1), J. E. Kurle (1); (1) University of Minnesota, St. Paul, MN, U.S.A.

105-P Pathogenicity of *Pythium* species from the North Central region on soybean and corn screened at two temperatures.
R. MATTHIESEN (1), M. Chilvers (2), A. Robertson (1); (1) Iowa State University, Ames, IA, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.

106-P Management of root rot caused by *Phytopythium helicoides* on pistachio rootstock.
E. J. Fichtner (1), G. T. Browne (2), C. L. BLOMQUIST (3); (1) Univ of California Coop Ext, Visalia, CA, U.S.A.; (2) USDA ARS, Davis, CA, U.S.A.; (3) Plant Pest Diagnostics Center, California Department of Food and Agriculture, Sacramento, CA, U.S.A.

107-P Chilling injury during imbibition of soybean seed increases incidence of damping-off caused by *Pythium torulosum*.
M. SERRANO (1), A. Robertson (1); (1) Iowa State University, Ames, IA, U.S.A.

108-P Chemotaxis and Pathogenicity Tests of *Phytophthora sojae* in *Lupinus* spp.
G. U. BELIGALA (1), V. Phuntumart (1); (1) Bowling Green State University, Bowling Green, OH, U.S.A.

109-P *Phytophthora* species recovered from irrigation reservoirs in Mississippi and Alabama nurseries and pathogenicity of three new species.
W. COPES (1), X. Yang (2), C. Hong (2); (1) USDA ARS, Poplarville, MS, U.S.A.; (2) Virginia Polytechnic Institute and State University, Virginia Beach, VA, U.S.A.

110-P Expression of glucan-active genes during production, conversion and germination of oospores in *Pythium ultimum*.
E. Giroux (1), T. L. Rintoul (1), K. Dadej (1), C. A. LEVESQUE (2); (1) Agriculture & Agri-Food Canada, Ottawa, ON, Canada; (2) Agric & Agri-Food Canada, Ottawa, ON, Canada

111-P *Phytophthora* species infesting Californian forest soil during a three year drought.
T. B. BOURRET (1), H. K. Mehl (1), D. M. Rizzo (1); (1) University of California, Davis, Davis, CA, U.S.A.

112-P Insights of the genome of spinach downy mildew pathogen *Peronospora farinosa* f. sp. *Spinaciae*.
C. FENG (1), B. Bluhm (2), K. Lamour (3), J. Correll (2); (1) Univ of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Arkansas, Fayetteville, AR, U.S.A.; (3) University of Tennessee, Knoxville, TN, U.S.A.

113-P Population biology of *Pseudoperonospora cubensis*, the causal agent of cucurbit downy mildew.
A. THOMAS (1), I. Carbone (1), P. Ojiambo (1); (1) North Carolina State University, Raleigh, NC, U.S.A.

114-P Factors affecting sporangial germination of *Peronospora belbahrii*, a causal organism of basil downy mildew.
J. S. PATEL (1), S. Zhang (2), M. I. Costa de Novaes (3); (1) Univ of Florida IFAS, Homestead, FL, U.S.A.; (2) TREC - Univ of Florida, Homestead, FL, U.S.A.; (3) Sponsored by CNPq, University of Florida, Homestead, FL, U.S.A.

115-P Use of scanning electron microscopy to visualize how oxathiapiprolin affects the initial infection process of potato leaves by *Phytophthora infestans*.
S. E. SALAS (1), C. P. Shepherd (2), N. M. Donofrio (3), D. H. Powell (4); (1) DuPont Crop Protection / University of Delaware, Newark, DE, U.S.A.; (2) DuPont Crop Protection, Newark, DE, U.S.A.; (3) College of Agriculture and Natural Resources, Plant and Soil Sciences, University of Delaware, Newark, DE, U.S.A.; (4) DBI BioImaging Center, University of Delaware, Newark, DE, U.S.A.

Virology

116-P A newly developed GFP-expressing *Barley stripe mosaic virus* infectious clone used to investigate seed transmission in barley in South Korea.
H. J. LIM (1), E. Y. Seo (2), J. Kim (2), J. S. Gong (1), H. K. Ju (3), C. H. Park (1), D. Li (4), N. Kim (5), C. Jang (5), I. Hwang (5), J. Hammond (6), H. S. Lim (1); (1) Chungnam National University, Deajeon, South Korea; (2) Chungnam National University, Daejeon, South Korea; (3) Chungnam National Universitiy, Deajeon, South Korea; (4) China Agricultural University, Beijing, China; (5) Central Research Institute of Kyung Nong Corporation, Gyeongju, South Korea; (6) United States Department of Agriculture-Agrocultural Research Service, Beltsville, MD, U.S.A.

117-P Effect of temperature on *Wheat streak mosaic virus* replication and movement in resistant and susceptible winter wheat varieties.
E. N. WOSULA (1), S. Tatineni (2), S. N. Wegulo (1), G. L. Hein (1); (1) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (2) United States Department of Agriculture-Agricultural Research Service and University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

118-P Full genome sequence of a novel candidate in the Mitovirus genus isolated from *Rhizoctonia cerealis*.
W. LI (1), T. Zhang (1), H. Chen (1), H. Yu (2); (1) Institute of Plant Protection, Jiangsu Academy of Agricultural Sciences, Nanjing, Jiangsu 210014, P.R. China, Nanjing, China; (2) College of life Sciences, Nanjing Agricultural University, Nanjing, Jiangsu 210095, P.R. China, Nanjing, China

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119-P Investigation of host gene expression modulation by *Triticum Mosaic Virus*.

N. MIHELICH (1), R. Roberts (1), K. S. Browning (2), A. M. Rakotondrafara (1); (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) University of Texas - Austin, Austin, TX, U.S.A.

120-P Evaluation of *Soil-borne wheat mosaic virus* as a viral vector for monocots.

S. JARUGULA (1), S. R. Charlesworth (2), F. Qu (3), L. R. Stewart (4); (1) Center for Applied Plant Sciences, Ohio State University, Wooster, OH, U.S.A.; (2) Queensland University of Technology, Brisbane, Australia; (3) Department of Plant Pathology, Ohio Agricultural Research and Development Center, Ohio State University, Wooster, OH, U.S.A.; (4) USDA/ARS, Ohio Agricultural Research and Development Center, Ohio State University, Wooster, OH, U.S.A.

121-P Complete genome sequence of the *Alfalfa latent virus*.

L. G. NEMCHINOV (1); (1) USDA ARS MPPL, Beltsville, MD, U.S.A.

122-P Nucleotide heterogeneity at the genomic 5'- and 3'-termini of California (CA) isolates of *Citrus tristeza virus* (CTV).

A. Y. CHEN (1), S. Watanabe (1), R. K. Yokomi (2), J. C. Ng (1); (1) Department of Plant Pathology and Microbiology, University of California, Riverside, Riverside, CA, U.S.A.; (2) United States Department of Agriculture–Agricultural Research Service, Parlier, CA, U.S.A.

123-P Evidence for the horizontal spread of Grapevine red-blotch associated virus in California vineyards.

M. R. SUDARSHANA (1), T. L. Lawler (2), B. W. Bahder (2), S. Bag (3), A. Li (2), M. M. Anderson (2), J. K. Uyemoto (4); (1) USDA ARS, Davis, CA, U.S.A.; (2) UC Davis, Davis, CA, U.S.A.; (3) University of California-Davis, Davis, CA, U.S.A.; (4) USDA-ARS, Davis, CA, U.S.A.

124-P Genetic diversity of *Grapevine vein clearing virus* ORF II indicates a complex viral population in wild and cultivated grapevines.

S. BEACH (1); (1) Missouri State University, Springfield, MO, U.S.A.

125-P Preliminary insights into the epidemiology of *Blueberry shock virus* in cranberry.

S. THOMAS-SHARMA (1), L. Wells (1), V. Kartanos (1), E. Saalau-Rojas (2), P. McManus (1); (1) University of Wisconsin, Madison, WI, U.S.A.; (2) UMass Cranberry Station, E.Wareham, MA, U.S.A.

126-P Genetic variation and population structure of CChMVd using deep sequencing.

J. Y. YOON (1), S. K. Choi (2), M. Park (3), G. S. Choi (2), P. Palukaitis (3); (1) Natonal Institute of Horticultural and Herbal Science, RDA, Jeon-Ju, South Korea; (2) National Institute of Horticultural and Herbal Science, RDA, Jeonju, South Korea; (3) Seoul Women's University, Seoul, South Korea

127-P An Argonaute sequence within the Iranian *Beet black scorch virus* satellite RNA.

M. MAHILLON (1), C. Bragard (2), M. Mehrvar (3); (1) Applied microbiology, Earth & Life Institute, Université catholique de Louvain, Croix du Sud, 2 bte L7.05.03. 1348 Louvain-la-Neuve, Belgium, Louvain-la-Neuve, , Belgium; (2) Applied microbiology, Earth & Life Institute, Université catholique de Louvain, Croix du Sud, 2 bte L7.05.03. 1348 Louvain-la-Neuve, Belgium, Louvain-la-Neuve, Belgium; (3) Department of Plant Protection, School of Agriculture, Ferdowsi University of Mashhad, Mashhad, Iran, Mashad, Iran

128-P Intimate interactions between two fungal RNA viruses: A capsidless ssRNA virophage hosted by an unrelated novel dsRNA virus.

R. Zhang (1), S. Hisano (1), A. Tani (1), H. Kondo (1), S. Kanematsu (2), N. SUZUKI (1); (1) IPSR, Okayama University, Kurashiki, Japan; (2) NARO Institute of Fruit Tree Science, Morioka, Japan

129-P Identification of visual phenotypes by *Tobacco rattle virus* VIGS expression of a *Nicotiana benthamiana* cDNA library.

E. y. SEO (1), J. K. Kim (1), S. Lim (2), S. H. Yu (1), J. Hammond (3), H. S. Lim (1); (1) Chungnam National University, Daejeon, South Korea; (2) Korea Research Institute of Bioscience and Biotechnology and University of Science and Technology, Daejeon, South Korea; (3) United States Department of Agriculture - Agricultural Research Service, Beltsville, MD, U.S.A.

130-P Next generation sequencing for identifying known and novel viruses in the Asian citrus psyllid, the vector of *C.* Liberibacter asiaticus.

S. NOURI (1), N. Salem (2), B. Falk (1); (1) University of California, Davis, CA, U.S.A.; (2) University of Jordan, Amman, Jordan

131-P Diversity and recombination of DNA-U3 of *Banana bunchy top virus*.

N. Yu (1), P. Zhou (1), J. Wang (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.

132-P Two amino acids of cassava novel cap-binding proteins critical for their interaction with *Cassava brown streak virus* VPg.

S. SHI (1), M. A. Mandel (1), Z. Xiong (1); (1) University of Arizona, Tucson, AZ, U.S.A.

133-P Isolates of *Turnip mosaic virus* collected in Korea showed differences in biological function of certain ORFs.

J. HAN (1), J. Chung (1), J. Kim (1), N. Kim (2), C. Jang (2), I. hwang (2), J. Hammond (3), H. S. Lim (1); (1) Chungnam National University, Daejeon, South Korea; (2) Central Research Institute of Kyung Nong Corporation, Gyeongju, South Korea; (3) United States Department of Agriculture-Agricultural Research Service, Beltsville, MD, U.S.A.

134-P Effect of soil potassium levels on *Iris yellow spot virus* in onion.

C. NISCHWITZ (1), H. Schwartz (2), E. Petrizzo (3), M. McCullough (3), B. Rhoads (4); (1) Utah State Univ, Logan, UT, U.S.A.; (2) Colorado State University, Fort Collins, CO, U.S.A.; (3) Utah State University, Logan, UT, U.S.A.; (4) Utha State University, Logan, UT, U.S.A.

135-P Prevalence of *Pepper mild mottle virus* in a nationwide survey in South Korea, and production of an infectious clone of the major isolate of PMMoV.

J. S. PARK (1), J. S. Gong (2), J. K. Kim (2), E. Y. Seo (2), N. g. Kim (3), C. Jang (3), I. Hwang (3), J. Hammond (4), H. G. Kim (2), H. S. Lim (2); (1) Chungnam National University, DaeJeon, South Korea; (2) Chungnam National University, Daejeon, South Korea; (3) Central Research Institute of Kyung Nong Corporation, Gyeongju, South Korea; (4) United States Department of Agriculture-Agrocultural Research Service, Beltsville, MD, U.S.A.

136-P Identification and characterization of an *Alfalfa mosaic virus* isolate associated with tuber necrosis in a potato variety.

X. NIE (1), D. De Koeyer (2), Z. Liang (2), V. Dickison (2), M. Singh (3), G. Hawkins (4); (1) Agric & Agri-Food Canada, Fredericton, NB, Canada; (2) Potato Research Centre, AAFC, Fredericton, NB, Canada; (3) Agri Certification Services, Fredericton, NB, Canada; (4) McCain Produce, Florenceville, NB, Canada

137-P Molecular characterization of recombinant strains of *Potato virus Y* from Saudi Arabia.

M. CHIKH-ALI (1), H. Alruwaili (1), D. Vander Pol (1), A. V. Karasev (2); (1) University of Idaho, Moscow, ID, U.S.A.; (2) Univ of Idaho, Moscow, ID, U.S.A.

138-P Genome characterization and genetic diversity of Sweet potato symptomless virus 1: a mastrevirus with an unusual nonanucleotide.

M. CAO (1), P. Lan (2), J. Abad (3), F. Li (4), C. Zhou (5), R. Li (6); (1) USDA-ARS, Beltsville, MD, U.S.A.; (2) Yunnan Agricultural University, Kunming, China; (3) USDA-APHIS, Beltsville, MD, U.S.A.; (4) Yunnan Agricultural University, Kunming, U.S.A.; (5) Southwest University, Chongqing, China; (6) USDA ARS, Beltsville, MD, U.S.A.

139-P Profiling virus infection using small RNA sequencing data: A case study of virome from a small-holder farm.

B. Cui (1), Y. Zheng (1), B. Xiang (1), Z. XIONG (2); (1) Shihezi University, Shihezi, China; (2) University of Arizona, Tucson, AZ, U.S.A.

140-P Transmission of Tomato spotted wilt virus by two thrips populations and evidence that adult thrips emerging from soil are an inoculum source.
L. F. CHEN (1), D. C. Mackie (1), B. A. Bazor (1), O. Batuman (1), D. E. Ullman (1), R. L. Gilbertson (1); (1) Univ of California, Davis, CA, U.S.A.

141-P WITHDRAWN

142-P *Tobacco mosaic virus*/*Tomato mosaic virus* contamination of tomato seed and transmission to transplants.
M. McCullough (1), C. NISCHWITZ (2), B. Rhoads (3), A. Klomp (1); (1) Utah State University, Logan, UT, U.S.A.; (2) Utah State Univ, Logan, UT, U.S.A.; (3) Utha State University, Logan, UT, U.S.A.

143-P Searching for synchrony: Seeking the early events in SW-5 Resistance.
N. A. ORDAZ (1), C. A. Stafford-Banks (1), S. P. Dinesh-Kumar (2), D. E. Ullman (3); (1) University of California, Davis, Oakley, CA, U.S.A.; (2) University of California, Department of Plant Biology and The Genome Center, College of Biological Sciences, Davis, CA, U.S.A.; (3) University of California, Davis, Davis, CA, U.S.A.

Postharvest Pathology & Mycotoxins

144-P Molecular Exploration of Beta-Lactamases in *Fusarium verticillioides*.
M. GAO (1), A. E. Glenn (2), S. E. Gold (2); (1) The University of Georgia, Athens, GA, U.S.A.; (2) USDA ARS, Richard B. Russell Res Center, Toxicology & Mycotoxin Res Unit, Athens, GA, U.S.A.

145-P Simple devices for determining grain moisture.
T. TUBBS (1), C. Woloshuk (1); (1) Purdue University, West Lafayette, IN, U.S.A.

146-P Stored mRNA and protein profiling to identify constitutive aflatoxin-resistance factors in mature maize seed.
M. Luo (1), R. L. BROWN (2), Z. Y. Chen (3), A. Menkir (4), C. Grimm (5), D. Bhatnagar (5); (1) LSU New Orleans School of Medicine, New Orleans, LA, U.S.A.; (2) USDA ARS SRRC, New Orleans, LA, U.S.A.; (3) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.; (4) International Institute of Tropical Agriculture, Ibadan, Nigeria; (5) USDA-ARS-SRRC, New Orleans, LA, U.S.A.

147-P Profile of Aspergilli in fields under continuous maize and groundnut cultivation and aflatoxin accumulation along the crop value chains in Mozambique.
J. AUGUSTO (1), J. Atehnkeng (2), J. Akello (3), P. J. Cotty (4), R. Bandyopadhyay (2); (1) Intl Inst of Tropical Agriculture, Nampula, Mozambique; (2) International Institute of Tropical Agriculture, Ibadan, Nigeria; (3) International Institute of Tropical Agriculture, Lusaka, Zambia; (4) USDA ARS, School of Plant Sciences, The University of Arizona, Tucson, AZ, U.S.A.

148-P Potential quail consumption of aflatoxin through contaminated deer corn.
G. SCHUSTER (1), B. Newman (2), S. Henke (2), A. Fedynich (2); (1) Texas A&M University - Kingsville, Texas A&M AgriLife Extension, Kingsville, TX, U.S.A.; (2) Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville, Kingsville, TX, U.S.A.

149-P *Aspergillus flavus* biomass in inoculated corn kernels as a function of mating type.
K. DAMANN (1), S. Chalivendra (2), C. DeRobertis (2); (1) Louisiana State Univ, Baton Rouge, LA, U.S.A.; (2) LSU AgCenter, Baton Rouge, LA, U.S.A.

150-P Mycotoxins detection on malting barley grains in the high lands of México.
L. M. VASQUEZ-SILLER (1), M. R. Zamora-Díaz (2), R. Gómez-Mercado (2), E. M. Rodríguez-Campos (1), K. C. Ordóñez-Morales (1); (1) Universidad Autónoma Agraria Antonio Narro (UAAAN), Saltillo, Mexico; (2) Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias (INIFAP), Texcoco, Mexico

151-P *Penicillium expansum* and *Penicillium griseofulvum* are agents of blue mould and produce patulin on pome and stone fruit.
M. L. GULLINO (1), D. Spadaro (2), A. Garibaldi (3), M. L. Gullino (4); (1) University of Torino, Agroinnova, DISAFA, Grugliasco Torino, Italy; (2) University of Torino, DISAFA, Agroinnova, Grugliasco, Italy; (3) University of Torino, Agroinnova, Grugliasco, Italy; (4) University of Torino, Agroinnova, DISAFA, Grugliasco, Italy

152-P Impact of postharvest practices on avocado contamination by *Listeria monocytogenes*.
D. MACARISIN (1), P. Evans (2), Y. Chen (2); (1) U.S. Food and Drug Administration, College Park, MD, U.S.A.; (2) Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administratio, College Park, MD, U.S.A.

153-P Managing quarantine-significant post harvest diseases in Pacific Northwest apple orchards.
P. Sikdar (1), M. MAZZOLA (2); (1) Washington State University, Wenatchee, WA, U.S.A.; (2) USDA-ARS, Wenatchee, WA, U.S.A.

154-P Control of two decays of grape and strawberry during cold storage by continuous treatment with reactive oxygen species.
M. T. Elkahky (1), J. A. BARTZ (2), M. Elsheshtawi (3), S. Elafifi (3), M. Elmazaty (3); (1) University of Florida, Gainesville, FL, U.S.A.; (2) Univ of Florida, Gainesville, FL, U.S.A.; (3) Mansoura University, Mansoura, Egypt

155-P Osmoprotectants and carriers for formulating co-cultures of Gram-negative biocontrol agents active against potato dry rot in storage.
D. SCHISLER (1), P. Slininger (1), N. Olsen (2), L. Woodell (2); (1) USDA ARS MWA NCAUR, Peoria, IL, U.S.A.; (2) University of Idaho, Kimberly, ID, U.S.A.

156-P WITHDRAWN

Biological Control

157-P Assessment of an antimicrobial peptide source to control *Pseudomonas* plant pathogens.
E. A. MOYA-ELIZONDO (1), T. P. Quezada (2), M. Reyes Salinas (3), M. A. Reyes Navarro (3); (1) Universidad de Concepcion, Chillán, Chile; (2) Universidad de Concepción, Chillán, Chile; (3) AVANCE BIOTECHNOLOGIES CHILE S.A., Santiago, Chile

158-P Concentrated ethanol-derived switchgrass extractives inhibit plant and foodborne pathogens.
A. BRUCE (1), H. B. Korotkin (1), B. H. Ownley (1), J. Tao (1), L. M. Kline (1), N. Labbe (1), K. D. Gwinn (1), D. H. 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.

159-P Screening of plant extracts for antibacterial activity against *Xanthomonas campestris* pv. *vitians* and *Pseudomonas cichorii*.
M. Delisle-Houde (1), V. Toussaint (2), A. Gosselin (1), R. TWEDDELL (1); (1) Centre de recherche en horticulture, Université Laval, Quebec, QC, Canada; (2) Agriculture and Agri-Food Canada, Saint-Jean-sur-Richelieu, QC, Canada

160-P Evaluation of native and non-native phytoalexins in suppressing *in vitro*, *in vivo*, and *in planta* growth of *Sclerotinia sclerotiorum*.
M. L. PAWLOWSKI (1), C. B. Hill (1), A. V. Lygin (1), O. V. Zernova (2), J. M. Widholm (1), V. V. Lozovaya (1), G. L. Hartman (1); (1) University of Illinois, Urbana, IL, U.S.A.; (2) University of Illinois, Champaign, IL, U.S.A.

161-P Development of non-pesticide cultivated technique to control *Colletotrichum* spp. associate with anthracnose on coffee plants in Taiwan.
Z. B. WU (1), F. L. Chi (2), J. S. Tsay (1); (1) Department of Horticulture, National Taitung Jr. College, Taitung County, Taiwan; (2) Department of Horticulture, National Chung Hsing University, Taichung County, Taiwan

162-P Impact of antimicrobial lipopeptides iturin and surfactin for *Fusarium* wilt of lettuce.
S. Fujita (1), K. YOKOTA (1); (1) Tokyo Univ of Agriculture, Tokyo, Japan

(continued)

163-P The effect of DominusTM and chitin treatments on actinomycete soil populations.

N. CHALASANI (1), J. Hong (2), N. Kokalis-Burelle (3), E. N. Rosskopf (4); (1) St. Edward's School, Vero Beach, FL, U.S.A.; (2) USDA ARS, Fort Pierce, FL, U.S.A.; (3) USDA, ARS, Fort Pierce, FL, U.S.A.; (4) USDA ARS, Ft Pierce, FL, U.S.A.

164-P Nematicidal activity in extracts of chenopods.

T. Kouser (1), D. I. Yates (2), K. D. GWINN (3); (1) Webb School of Knoxville, Knoxville, TN, U.S.A.; (2) University of Tennessee and David Crockett High School, Knoxville, TN, U.S.A.; (3) Univ of Tennessee, Knoxville, TN, U.S.A.

165-P WITHDRAWN

166-P Reduction in the population of *Phytophthora capsici* and disease severity in chile pepper by extracts from pecan shell and husk tissues.

S. SANOGO (1), P. Lujan (1), J. Idowu (2); (1) New Mexico State Univ, Las Cruces, NM, U.S.A.; (2) New Mexico State University, Las Cruces, NM, U.S.A.

167-P Influence of native plasmids to fitness of *Pantoea vagans* strain C9-1.

J. M. KLEIN (1), V. Stockwell (1), J. Loper (2); (1) Department of Botany and Plant Pathology, Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS, Horticultural Crops Research Unit, Corvallis, OR, U.S.A.

168-P *Xylella fastidiosa* PD1311 deleted strain as promising Pierce's disease biological control.

L. Hao (1), K. Johnson (1), L. Cursino (2), T. J. Burr (1), P. MOWERY (2); (1) Cornell University / New York State Agricultural Experiment Station, Geneva, NY, U.S.A.; (2) Hobart & William Smith Colleges, Geneva, NY, U.S.A.

169-P Antagonistic and symbiotic activity of fluorescent *Pseudomonas* and rhizobia associated with root nodules of *Vigna radiata* and *Leucaena leucocephala.*

R. Noreen (1), J. ARA (2), V. Sultana (3), S. Ehteshamul-Haque (1); (1) Department of Botany, University of Karachi, Karachi, Pakistan; (2) Department of Food Science & Technology, University of Karachi, Karachi, Pakistan; (3) Department of Biochemistry, University of Karachi, Karachi, Karachi, Pakistan

170-P Bioactivity of an endophytic bacterium in *Betula occidentalis.*

T. SMART (1), M. Sullivan (2), M. Roberts (2); (1) Brigham Young Univ, Provo, UT, U.S.A.; (2) Brigham Young University, Provo, UT, U.S.A.

171-P Sensitivity of various genotypes of *Xanthomonas campestris* pv. *vitians* to bacteriophages isolated from soil and water in lettuce production fields.

G. J. RAMOS (1), I. Rubio (2), A. Wright (3), R. J. Hayes (4), C. T. Bull (5); (1) Science and Math Institute, Hartnell College, Salinas, CA, U.S.A.; (2) Department of Plant Pathology, University of Wisconsin, Madison, WI, U.S.A.; (3) Hartnell College, Salinas, CA, U.S.A.; (4) USDA, ARS, Salinas, CA, U.S.A.; (5) USDA ARS, Salinas, CA, U.S.A.

172-P Characterization of *Bacillus amyloliquefaciens* strain BAC03 for plant growth promotion.

Q. Meng (1), H. JIANG (2), J. Hao (3); (1) Univ of Maine, Spencer, IA, U.S.A.; (2) Univ of Maine, Orono, ME, U.S.A.; (3) Univ of Maine, orono, ME, U.S.A.

173-P Profiling and functional characterization of the secondary metabolites produced by plant-growth-promoting *Bacillus pumilus* PMB102.

J. J. Wu (1), W. L. DENG (2), J. Y. Tzeng (2), J. W. Huang (2); (1) National Chung Hsing University and Academia Sinica, Ph.D. Program in Microbial Genomics, Taichung, Taiwan; (2) National Chung Hsing University, Department of Plant Pathology, Taichung, Taiwan

174-P Screening of probiotics for livestock feeding rye silage.

H. S. KIM (1), S. Kim (2), J. Kim (1), Y. S. Kwak (1); (1) Gyeongsang National University, Jinju, Korea; (2) Gyeongsang National University, Jinu, Korea

175-P Suppression of *Gibberella fujikuroi* in rice by rice-associated antagonistic bacteria.

D. B. SHIN (1), E. J. Jung (1), I. J. Kang (1), J. Goh (1), H. k. Shim (1), J. Roh (1); (1) National Institute of Crop Science, Suwon, South Korea

176-P In vitro antagonism of *Trichoderma* species against *Fusarium tucumaniae* and *Fusarium virguliforme.*

M. M. SCANDIANI (1), A. I. Faura (2), W. Vargas (3), A. Luque (4), G. Gonzalez Anta (2); (1) Rizobacter Argentina S.A., Pergamino, Argentina; (2) Rizobacter, Pergamino, Argentina; (3) Centro de Estudios Fotosintéticos y Bioquimicos, Rosario, Argentina; (4) Centro de Referencia de Micología, Rosario, Argentina

177-P Relationships between fungal communities of the crown and genotypes of 2,4-DAPG and phenazine-producing *Pseudomonas* bacteria in Chilean wheat crops.

E. A. MOYA-ELIZONDO (1), H. A. Doussoulin (2), N. L. Arismendi (1); (1) Universidad de Concepción, Chillán, Chile; (2) Universidad Austral de Chile, Valdivia, Chile

178-P The use of endophytes to reduce growth of the soybean pathogen *Sclerotinia sclerotiorum.*

A. JOHNSON (1), A. Impullitti (1); (1) Augsburg College, Minneapolis, MN, U.S.A.

179-P Control of *Penicillium expansum* with yeasts recovered from various plant materials

V. H. TOURNAS (1), E. J. Katsoudas (2); (1) Center for Food Safety and Applied Nutrition/FDA, College Park, MD, U.S.A.; (2) Office of Regulatory Affairs/FDA, Jamaica, NY, U.S.A.

180-P WITHDRAWN

181-P Biocontrol efficacies of *Paenibacillus polymyxa* against ginseng root rot caused by *Cylindrocarpon destructans.*

Y. S. KIM (1), Y. Jeon (2); (1) Andong Natl Univ, Andong, Korea; (2) Andong National University, Andong, South Korea

182-P Antagonistic activity of potential biocontrol agents screened against *Pythium* spp. that cause seedling disease.

R. Matthiesen (1), M. MORGAN (2), A. Fakhoury (3), A. Robertson (2); (1) Iowa State Univ, Ames, IA, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.; (3) Southern Illinois University, Carbondale, IL, U.S.A.

183-P Screening and assessment of bacterial bio-agents from soils to control papaya root rot caused by *Pythium* sp. in Taiwan.

T. Y. CHEN (1), Y. H. Chang (1), H. P. Chou (1), M. N. Tseng (1), T. C. Huang (1); (1) Kaohsiung District Agricultural Research and Extension Station, Pingtung, Taiwan

184-P Management of powdery mildew on wild mint within protected lands.

G. T. SCHIERMAN (1), C. Y. Kadooka (2), J. Uchida (2), C. Smith (2); (1) PEPS, Honolulu, HI, U.S.A.; (2) University of Hawaii at Manoa, Honolulu, HI, U.S.A.

185-P Screening and application of the nonpathogenic *Fusarium oxysporum* in Taiwan.

W. H. CHUNG (1), C. J. Wang (1); (1) Natl Chung Hsing Univ, Taichung, Taiwan

186-P WITHDRAWN

187-P Identification of unknown sterile fungi as *Rhizoctonia zeae* and potential for biological control for fungal root diseases of sugar beet.

K. M. WEBB (1), R. M. Harveson (2); (1) USDA ARS, SBRU, Fort Collins, CO, U.S.A.; (2) University of Nebraska, Panhandle Research and Extension Center, Scottsbluff, NE, U.S.A.

188-P Compound(s) produced by *Clonostachys rosea* are deleterious to *Botrytis cinerea.*

A. V. BORGES (1), R. M. Saraiva (2), F. C. Borel (3), L. A. Maffia (3); (1) Univ Federal De Vicosa, Vicosa, Brazil; (2) Universidade Federal de Vicosa, UFV, Brazil; (3) Universidade Federal de Vicosa, Vicosa, Brazil

189-P Prospecting for cold-hardy autochthonous novel bacteria in crop root microbiome.

A. ADESEMOYE (1), H. H. Wei (2), G. Yuen (3); (1) Department of Plant Pathology, WCREC, University of Nebraska Lincoln, North Platte, NE, U.S.A.; (2) WCREC, University of Nebraska Lincoln, North Platte, NE, U.S.A.; (3) Department of Plant Pathology, University of Nebraska Lincoln, Lincoln, NE, U.S.A.

190-P Bio-control agent *Bcillus subtilis* SMS combined with silver nanoparticles against *Botrytis squamosa*.
S. GAO (1), X. Yue (1), L. Luo (1), J. Li (1); (1) China Agricultural University, Beijing, China

191-P Seasonal phytobiome alterations associated with wild and cultivated cranberry fruit.
A. HARRISON (1), M. Mohabbatizadeh (1), S. Soby (1); (1) Midwestern University, Glendale, AZ, U.S.A.

192-P Fluorescent *Pseudomonas* spp. associated with cranberry (*Vaccinium macrocarpon* Ait.).
J. THOMSON (1), A. Harrison (1), S. Gadagkar (1), C. Bull (2), S. Soby (1); (1) Midwestern University, Glendale, AZ, U.S.A.; (2) United States Department of Agriculture - Agricultural Research Service, Salinas, CA, U.S.A.

193-P Disease-suppressive soils induce systemic resistance in *Arabidopsis thaliana* against *Pseudomonas syringae* pv. *tomato*.
D. M. WELLER (1), J. A. van Pelt (2), C. M. J. Pieterse (2), P. A. H. Bakker (2); (1) USDA-ARS, Washington State University, Pullman, WA, U.S.A.; (2) Utrecht University, Utrecht, Netherlands

194-P Unraveling the microbial profile of the rhizosphere of SDS-suppressive soils in soybean fields.
A. Y. SROUR (1), L. Leonardo (2), D. Malvick (3), A. Fakhoury (1); (1) Southern Illinois University, Carbondale, IL, U.S.A.; (2) Iowa State University, Ames, IA, U.S.A.; (3) University of Minnesota, St. Paul , MN, U.S.A.

195-P Harnessing the power of endemic fungal communities in the boxwood rhizosphere.
Y. RIVERA (1), P. Ndukwe (2), L. Cornelius (2), J. A. Crouch (2); (1) USDA ARS, Beltsville, MD, U.S.A.; (2) USDA-ARS, Beltsville, MD, U.S.A.

196-P *Rhizoctonia solani* suppressive soil from safflower field soil.
G. EBADZAD (1), S. Turner (2), S. D. Soby (3); (1) Midwestern University, Glendale, AZ, U.S.A.; (2) Eastern Agricultural Research Center, Montana State University, Sidney, MT, U.S.A.; (3) Biomedical Sciences, College of Health Sciences and College of Veterinary Medicine, Midwestern University, Glendale, AZ, U.S.A.

197-P Fungal community structure associated with eastern hemlock and hemlock woolly adelgid infestation.
K. WICKERT (1), M. T. Kasson (1); (1) West Virginia University, Morgantown, WV, U.S.A.

198-P Examination and classification of secondary metabolites from endophytes of *Cornus sericea*.
M. SULLIVAN (1), B. Geary (1), T. Smart (1), M. Roberts (1); (1) Brigham Young University, Provo, UT, U.S.A.

199-P Applications of *Bacillus amyloliquefaciens* PMB01 for managing tomato bacterial wilt caused by *Ralstonia solanacearum*.
H. P. Chou (1), Y. H. Lin (2), T. C. Huang (3), W. L. DENG (4); (1) Natl Chung Hsing University, Department of Plant Pathology, Taichung, Taiwan; (2) National Pingtung Universityof Science and Technology, Department of Plant Medicine, Pingtung, Taiwan; (3) Kaohsiung District Agricultural Research and Extension Station, Kaohsiung, Taiwan; (4) National Chung Hsing University, Department of Plant Pathology, Taichung, Taiwan

200-P Emergence of common bean seedlings from seeds infected by *Sclerotinia sclerotiorum* and treated with *Clonostachys rosea*.
F. C. BOREL (1), L. A. Maffia (2), L. F. Soares (1); (1) Univ Federal De Vicosa, Vicosa, Brazil; (2) Universidade Federal de Vicosa, Vicosa, Brazil

201-P Use of *Trichoderma harzianum* Th2 to control seedborne pathogens on barley and wheat.
M. M. SCANDIANI (1), J. Zapiola (2), A. Faura (3), L. Gasoni (2), A. Luque (4), G. Gonzalez Anta (3); (1) Rizobacter Argentina S.A., Pergamino, Argentina; (2) Instituto de Microbiología y Zoología Agrícola, Hurlingham, Argentina; (3) Rizobacter, Pergamino, Argentina; (4) Centro de Referencia de Micología, Rosario, Argentina

202-P Genotype-level interactions determine the degree of reduction of leaf rust on wheat by seed application of beneficial pseudomonads.
F. MASCHER (1), A. Sharifi-Tehrani (2), S. Kellenberger (1), M. Farzaneh (2), M. Pechy-Tarr (3), C. Keel (3); (1) Agroscope IPV, Nyon, Switzerland; (2) University of Tehran, Karaj, Iran; (3) University of Lausanne, Lausanne, Switzerland

203-P Evaluation of *Allium sativum* and *Trichoderma asperellum* for the control of cowpea anthracnose disease caused by *Colletotrichum lindemuthianum*.
D. B. OLUFOLAJI (1), M. A. Ajayi (1); (1) Federal Univ of Technology, Akure, Nigeria

204-P Effect of rhapsody (*Bacillus subtilis*) on post-harvest pathogen development on fresh market tomatoes.
Z. K. PUNJA (1), G. Rodriguez (1); (1) SIMON FRASER UNIVERSITY, Burnaby, BC, Canada

205-P Evaluation of biological control products for management of powdery mildew on greenhouse cucumbers.
Z. K. PUNJA (1), D. Collyer (2), A. Tirajoh (2); (1) Simon Fraser Univ, Burnaby, BC, Canada; (2) SIMON FRASER UNIVERSITY, Burnaby, BC, Canada

206-P Evaluation of the effects of soybean seed treatments on yield and soybean cyst nematode (*Hetrodera glycines*) populations.
K. M. MUSIL (1), N. J. Arneson (1), L. J. Giesler (1); (1) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

207-P WITHDRAWN

208-P Plant growth promotion of PGPR on soybean and cotton with and without *Heterodera glycines or Meloidogyne incognita*.
N. XIANG (1), K. S. Lawrence (2), J. W. Kloepper (2), J. A. McInroy (3); (1) AUBURN UNIVERSITY, Auburn, AL, U.S.A.; (2) AUBURN UNIVERSITY, AUBURN, AL, U.S.A.; (3) Auburn Univ, Auburn, AL, U.S.A.

209-P Use of propidium monoazide and qPCR to quantify viable and nonviable conidia of *Aspergillus flavus* in almond soils.
A. ORTEGA-BELTRAN (1), Y. Luo (1), T. J. Michailides (1); (1) University of California, Davis, Kearney Agricultural Research and Extension Center, Parlier, CA, U.S.A.

210-P Evaluation of different substrates for inducing the volatile-antibiotic compounds from *Nodulisporium* sp. PDL-005 and control of citrus green mold.
C. C. YEH (1), W. H. Chung (1); (1) National Chung Hsing University, Taichung, Taiwan

211-P WITHDRAWN

212-P Optimization of *Bacillus subtilis* electric transformation scheme.
X. Y. ZHAO (1), S. Gao (1), Z. G. Ren (1), Z. P. Liu (1), Y. M. Wei (1), Q. X. Shang (1); (1) Beijing University of Agriculture, Beijing, China

213-P Selecting an inoculation method to assess the efficacy of biological treatments against verticillium wilt of olive trees.
A. Varo-Suarez (1), J. MORAL (2), A. Trapero-Casas (1); (1) Univ. de Cordoba, Cordoba, Spain; (2) Univ De Cordoba, Cordoba, Spain

(continued)

214-P Functional genomics of biocontrol agents *Bacillus mycoides* BM02 and *B. pumilus* PMB102 against *Fusarium oxysporum* f. sp. *Lycopersici.*
W. L. DENG (1), J. J. Wu (2), J. Y. Tzeng (1), J. Leveau (3), J. W. Huang (1); (1) National Chung Hsing University, Department of Plant Pathology, Taichung, Taiwan; (2) National Chung Hsing University and Academia Sinica, Ph.D. Program in Microbial Genomics, Taichung, Taiwan; (3) University of California at Davis, Department of Plant Pathology, Davis, CA, U.S.A.

215-P Use of bacterial strains degrading 3-hydroxy palmitate methyl ester, the *Ralstonia* quorum sensing signal, as biocontrol agents.
K. RIAZ (1), S. Genin (2), D. Faure (3), Y. Dessaux (4); (1) Univ of Agriculture Faisalabad, Faisalabad, Pakistan; (2) Laboratoire des Interactions Plantes Micro-organismes, UMR CNRS-INRA 2594/441, F- 31320 Castanet Tolosan, France, Toulouse, France; (3) Département de Microbiologie Institut de biologie intégrative de la cellule (Institute of integrative cell biology) CNRS – Bât 23 Avenue de la terrasse 91198 Gif sur Yvette CEDEX France, Gif sur Yvette, France; (4) Département de Microbiologie Institut de biologie intégrative de la cellule (Institute of integrative cell biology) CNRS – Bât 23 Avenue de la terrasse 91198 Gif sur Yvette CEDEX France, Gif sur Yvette, Pakistan

216-P Does this antibiotic make my hypha look fat? Phenotypes associated with *Bacillus mojavensis* antagonism of *Fusarium verticillioides.*
A. BLACUTT (1), T. R. Mitchell (2), S. E. Gold (2); (1) University of Georgia, Athens, GA, U.S.A.; (2) USDA ARS, Athens, GA, U.S.A.

217-P *Bacillus mojavensis* biofilm formation and biosurfactant production using a laser ablation electrospray ionization system.
C. W. BACON (1), D. M. Hinton (2), T. R. Mitchell (3); (1) USDA ARS, US National Poultry Research Center, Athens, GA, U.S.A.; (2) USDA, ARS, US National Poultry Research Center, Russell Research Center, Athens, GA, U.S.A.; (3) USDA, ARS, US National Poultry Research Center, Athens, GA, U.S.A.

218-P *Streptomyces griseus* S4-7 sporulation factor, *whi*, involves in antifungal activity.
H. CHO (1), J. Kim (2), Y. S. Kwak (3); (1) Gyeongsang National University, Jinju, Gyeongnam, Korea; (2) Gyeongsang National University, Jinu, Korea; (3) Gyeongsang National University, Jinju, Korea

219-P Spore yield and resource depletion by *Aspergillus flavus* AF36 on wheat grain.
R. JAIME (1), P. J. Cotty (2); (1) University of Arizona, Tucson, AZ, U.S.A.; (2) USDA ARS, University of Arizona, Tucson, AZ, U.S.A.

Chemical Control

220-P *In vitro* testing of antimicrobial compounds for citrus HLB management.
J. (. HU (1), A. Nagaraju (2), N. Wang (3); (1) Univ of Florida, Lake Alfred, FL, U.S.A.; (2) CREC-University of Florida, Lake Alfred, FL, U.S.A.; (3) University of Florida, Lake Alfred, FL, U.S.A.

221-P Determination of phytotoxic concentrations of different salts for potential use as antibacterial agents on lettuce.
M. Delisle-Houde (1), V. Toussaint (2), R. TWEDDELL (1); (1) Centre de recherche en horticulture, Université Laval, Quebec, QC, Canada; (2) Agriculture and Agri-Food Canada, Saint-Jean-sur Richelieu, QC, Canada

222-P Inhibitory effects of organic and inorganic salts on the growth of *Pseudomonas cichorii*, causative agent of lettuce varnish spot.
H. Affia (1), V. Toussaint (2), R. TWEDDELL (1); (1) Centre de recherche en horticulture, Université Laval, Quebec, QC, Canada; (2) Agriculture and Agri-Food Canada, Saint-Jean-sur Richelieu, QC, Canada

223-P In vitro fungicide efficacy against the emerging pathogens *Macrophomina phaseolina* and *Fusarium oxysporum* f. sp. *fragariae* of strawberry.
M. CARTER (1), G. Holmes (2), K. Ivors (1); (1) Department of Horticulture and Crop Science, California Polytechnic State University, San Luis Obispo, CA, U.S.A.; (2) Strawberry Sustainability Research and Education Center, California Polytechnic State University, San Luis Obispo, CA, U.S.A.

224-P *In vitro* assessment of foliar fungicides against major pathogens of soybean.
S. S. NAVI (1), X. Yang (2), A. Rajasab (3); (1) Iowa State Univ, Ames, IA, U.S.A.; (2) Iowa State University, ames, IA, U.S.A.; (3) Tumkur University, Vishwavidyanilaya Karyalaya, Tumkur, India

225-P Survival of microsclerotia of two species of boxwood blight pathogen when exposed to sanitizers.
N. SHISHKOFF (1); (1) USDA ARS FDWSRU, Frederick, MD, U.S.A.

226-P Sensitivities of fungal pathogens of pomegranate (*Punica granatum* L.) to seven different fungicides.
A. N. KC (1), G. Vallad (1); (1) University of Florida, Wimauma, FL, U.S.A.

227-P Efficacy of fungicides on mycelial growth and pigmentation, and sclerotia and oxalic acid production by *Sclerotinia sclerotiorum*.
G. KAUR (1), P. LUJAN (2), S. Sanogo (2), N. Puppala (2); (1) NEW MEXICO STATE UNIVERSITY, Las Cruces, NM, U.S.A.; (2) New Mexico State University, Las Cruces, NM, U.S.A.

228-P Inhibitory activity of the new SDHI fungicide benzovindiflupyr against *Colletotrichum* species and other plant pathogens.
H. ISHII (1), F. Zhen (2), M. Hu (2), X. Li (3), G. Schnabel (2); (1) Natl Inst for Agro-Environmental Sciences/Clemson University/Kibi International University, Tsukuba, Japan; (2) Clemson University, Clemson, SC, U.S.A.; (3) Clemson University, Clemson, TN, U.S.A.

229-P Oxathiapiprolin, a new fungicide active ingredient for control of foliar diseases caused by oomycetes on leafy vegetables.
J. E. HAMILL (1), R. Bounds (2), P. Kuhn (3), A. Tally (3), J. Haskell (4), B. Druebbisch (3); (1) Syngenta Crop Protection, Santa Maria, CA, U.S.A.; (2) Syngenta Crop Protection, Visalia, CA, U.S.A.; (3) Syngenta Crop Protection, Greensboro, NC, U.S.A.; (4) Syngenta Crop Protection, Vero Beach, FL, U.S.A.

230-P Oxathiapiprolin, a new tool for control of soil-borne phytophthora diseases.
A. TALLY (1), P. Kuhn (1), J. Haskell (1), B. Druebbisch (1); (1) Syngenta Crop Protection, Greensboro, NC, U.S.A.

231-P Oxathiapiprolin, a new fungicide active ingredient for control of foliar diseases caused by oomycetes on cucurbits and fruiting vegetables.
K. WHITTEN BUXTON (1), P. Kuhn (2), A. Tally (2), B. Druebbisch (2); (1) Syngenta Crop Protection, Vero Beach, FL, U.S.A.; (2) Syngenta Crop Protection, LLC, Greensboro, NC, U.S.A.

232-P Oxathiapiprolin, a new fungicide active ingredient for control of diseases caused by oomycetes.
P. KUHN (1), A. Tally (1), B. Druebbisch (1); (1) Syngenta Crop Protection, LLC, Greensboro, NC, U.S.A.

233-P WITHDRAWN

234-P Superior performance of a silver-based nanocomposite in relation to copper for management of bacterial spot of tomato in the greenhouse.
A. L. STRAYER (1), I. Ocsoy (2), W. Tan (2), J. B. Jones (3), M. L. Paret (4); (1) Univ of Florida, Gainesville, FL, U.S.A.; (2) Center for Research at the Bio/Nano Interface, Department of Chemistry and Shands Cancer Center, University of Florida, Gainesville, FL, U.S.A.; (3) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (4) Department of Plant Pathology, North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.

235-P Efficacy of kasugamycin against olive knot caused by *Pseudomonas savastanoi* pv. *savastanoi* and its potential use in California olive production.
K. NGUYEN (1), H. Forster (2), J. Adaskaveg (2); (1) University of California Riverside, Colton, CA, U.S.A.; (2) University of California Riverside, Riverside, CA, U.S.A.

236-P Evaluation of treatments for eradication of *Xanthomonas* from seeds of Capsicum pepper.
B. S. KIM (1); (1) Kyungpook Natl Univ, Daegu, Korea

237-P Fungicide use in maize: results from the 2009 Midwestern crop management survey.

D. A. Shah (1), P. D. Esker (2), C. A. Bradley (3), A. E. Robertson (4), S. P. Conley (5), P. A. PAUL (6); (1) Kansas State University, Manhattan, KS, U.S.A.; (2) Universidad de Costa Rica, San José, Costa rica; (3) University of Illinois, Urbana-Champaign, IL, U.S.A.; (4) Iowa State University, Ames, IA, U.S.A.; (5) University of Wisconsin, Madison, WI, U.S.A.; (6) The Ohio State University, Wooster, OH, U.S.A.

238-P Management of Phomopsis stem canker in sunflowers.

M. GILLEY (1), R. Harveson (2), J. Caroline (3), J. Schaefer (4), S. Meyer (1), J. Nehring (4), M. Kirsch (3), F. Mathew (5), S. Markell (1); (1) North Dakota State University, Fargo, ND, U.S.A.; (2) University of Nebraska, Scottsbluff, NE, U.S.A.; (3) DAS/ Mycogen Seed, Breckenridge, MN, U.S.A.; (4) CHS Sunflower, Grandin, ND, U.S.A.; (5) South Dakota State University, Brookings, SD, U.S.A.

239-P Chemical control as strategy for reducing the impact of leaf anthracnose and host resistance management in sorghum.

A. G. C. SOUZA (1), L. V. Cota (2), D. D. Silva (2), F. E. Lanza (2), R. V. Costa (2), E. A. Guimarães (3); (1) Univ Federal de Vicosa, Belo Horizonte, Brazil; (2) EMBRAPA, SETE LAGOAS, Brazil; (3) Universidade Federal de Lavras, Lavras, Brazil

240-P Frogeye leaf spot management and the impact of fungicide phytotoxicity in Mississippi soybean.

W. J. MANSOUR (1), T. H. Wilkerson (1), J. T. Irby (2), B. R. Golden (1), T. W. Allen (3); (1) Mississippi State University, Stoneville, MS, U.S.A.; (2) Mississippi State University, Starkville, MS, U.S.A.; (3) Mississippi State Univ, Stoneville, MS, U.S.A.

241-P In-furrow control of *Rhizoctonia solani* with a combination of starter fertilizer and azoxystrobin.

C. IRWIN (1), D. Anderson (2), J. Dinglasan (2), H. Pham (2), R. Gong (2); (1) Vive Crop Protection, Guelph, ON, Canada; (2) Vive Crop Protection, Toronto , ON, Canada

242-P Impact of ILeVO® on the infection and colonization of soybean roots by *Fusarium virguliforme*.

K. ISLAM (1), J. P. Bond (1), J. Riggs (2), A. M. Fakhoury (1); (1) Southern Illinois Univ, Carbondale, IL, U.S.A.; (2) Bayer CropScience LP, Research Triangle Park, NC, U.S.A.

243-P Field efficacy of new fungicides for management of narrow brown leaf spot of rice.

X. G. Zhou (1), S. S. UPPALA (2); (1) Texas A&M AgriLife Research, College Station, TX, U.S.A.; (2) Texas A&M AgriLife Research, Beaumont, TX, U.S.A.

244-P Effect of fungicides on chlorophyll content and percent green leaf area of winter wheat subjected to high disease pressure in a controlled environment.

N. GRAF GRACHET (1), R. Hunger (1), M. Payton (1), J. Edwards (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.

245-P Efficacy of SDHI fungicides to protect leaves and fruits from infections of apple scab (*Venturia inaequalis*) in apple orchards in Maule Region, Chile.

M. LOLAS (1), G. Diaz (1), M. Caceres (1), R. Mendez (1); (1) Universidad de Talca, Talca, Chile

246-P Management of bull's-eye rot of apple using pre- and postharvest fungicides.

C. G. AGUILAR (1), C. L. Xiao (2), M. Mazzola (3); (1) Washington State University, Wenatchee, WA, U.S.A.; (2) USDA-ARS, Parlier, CA, U.S.A.; (3) USDA-ARS, Wenatchee, WA, U.S.A.

247-P Strategies for improving the Kinnow scab/malanose management plan: a major export quality issue in Pakistani citrus.

A. REHMAN (1), A. U. Malik (2), M. Yasin (3), M. Ahsan (4), H. Bashir (4), M. W. Alam (1), B. Saleem (5), K. Riaz (1); (1) Department of Plant Pathology University of Agriculture Faisalabad 38040- Pakistan, Faisalabad, Pakistan; (2) Institute of Horticultural Sciences, University of Agriculture Faisalabad 38040- Pakistan, Faisalabad, Pakistan; (3) Institute of Soil and Environmental Sciences, University of Agriculture Faisalabad 38040- Pakistan, Faisalabad, Pakistan; (4) Department of Entomology, University of Agriculture Faisalabad 38040- Pakistan, Faisalabad, Pakistan; (5) Department of Agriculture Extension, Government of Punjab -Pakistan, Sargodha, Pakistan

248-P Evaluation of dormant sprays for reducing pecan scab inoculum and implications for disease management.

K. A. BROWN (1), T. B. Brenneman (2); (1) Univ of Georgia, Baconton, GA, U.S.A.; (2) University of Georgia, Tifton, GA, U.S.A.

249-P Efficacy of late-dormant calcium polysulfide applications for control of Exobasidium leaf and fruit spot of blueberry.

P. BRANNEN (1), H. Scherm (2), A. Savelle (2), B. Shirley (3), J. Jacobs (3), J. Taylor (3), P. Edwards (3), R. Holland (3), S. Curry (3), T. Varnedore (3); (1) Univ of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Athens, GA, U.S.A.; (3) University of Georgia Cooperative Extension Service, Athens, GA, U.S.A.

250-P Effect of Pyraclostrobin spray either solo or in combination with other chemicals on soybean diseases and yield response in Iowa from 2003 to 2013.

S. NAVI (1), X. Yang (2), X. Li (2), L. Jing (3); (1) Iowa State Univ, Ames, IA, U.S.A.; (2) iowa state university, ames, IA, U.S.A.; (3) Inner Mongolia Agricultural University, Hohhot, China

251-P Frogeye leaf spot response to solo and combination fungicides.

A. COCHRAN (1), H. M. Kelly (2), K. Lamour (3), C. A. Bradley (4); (1) Univ of Tennessee, Jackson, TN, U.S.A.; (2) University of Tennessee, Jackson, TN, U.S.A.; (3) University of Tennessee, Knoxville, TN, U.S.A.; (4) University of Illinois, Urbana, IL, U.S.A.

252-P Fungicides and biocontrols for management of *Sclerotium rolfsii* on stevia.

A. KOEHLER (1), H. D. Shew (1); (1) North Carolina State University, Raleigh, NC, U.S.A.

253-P WITHDRAWN

254-P Assessment of soil-applied fungicides for control of onion pink root.

P. WIRIYAJITSOMBOON (1), M. K. Hausbeck (2); (1) Michigan State Univ, East Lansing, MI, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.

255-P Management of Rhizoctonia diseases of sugar beet under a replant scenario with various fungicide application methods in the high plains.

W. L. STUMP (1), W. Cecil (1), A. Burkhardt (1); (1) University of Wyoming, Laramie, WY, U.S.A.

256-P A food grade oil product induces resistance to diseases and insect pests in vegetable crops.

M. R. MCDONALD (1), I. Teshler (2), M. Fefer (2); (1) Univ of Guelph, Guelph, ON, Canada; (2) Petro-Canada Lubricants Inc, Mississaugua, ON, Canada

257-P Managing impatiens downy mildew in Florida.

S. N. SUAREZ (1), T. J. Shekels (1), A. J. Palmateer (2); (1) University of Florida, Homestead, FL, U.S.A.; (2) Univ of Florida, Homestead, FL, U.S.A.

258-P Application of a copper-based algaecide to mitigate species of *Phytophthora* in nursery irrigation ponds.

J. HWANG (1), J. Hayes (2), W. M. Bishop (3), S. N. Jeffers (1); (1) Clemson University, Clemson, SC, U.S.A.; (2) South Carolina Aquatics, Sumter, SC, U.S.A.; (3) SePRO Corporation, Whitakers, NC, U.S.A.

259-P Seed treatments with fungicides, resistance inducer and hot air to control downy mildew of basil.

M. L. GULLINO (1), M. L. Gullino (2), G. Gilardi (3), A. Garibaldi (3); (1) University of Torino, Agroinnova, DISAFA, Grugliasco Torino, Italy; (2) University of Torino, Agroinnova, DISAFA, Grugliasco, Italy; (3) University of Torino, Agroinnova, Grugliasco, Italy

260-P Oxathiapiprolin: a new fungicide for control of potato late blight (*Phytophthora infestans*).

J. I. ADKINS (1), P. Kuhn (2), A. Tally (2), B. Druebbisch (2); (1) Syngenta, Richland, WA, U.S.A.; (2) Syngenta Crop Protection, LLC, Greensboro, NC, U.S.A.

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261-P Efficacy of drip tape and shank applications of Dominus™ against *Macrophomina phaseolina*, the cause of charcoal rot in strawberry.
M. CHAMORRO RODRIGUEZ (1); (1) University of Florida, Wimauma, FL, U.S.A.

262-P Young almond orchard performance as affected by preplant soil fumigation or steam in a replanted site with the presence of plant parasitic nematodes.
D. DOLL (1), A. Johnson (2), G. T. Browne (3), B. Hanson (2), S. Fennimore (4); (1) Univ of California, Merced, CA, U.S.A.; (2) Univ of California, Davis, CA, U.S.A.; (3) USDA ARS, Davis, CA, U.S.A.; (4) Univ of California, Salinas, CA, CA, U.S.A.

263-P Vertical dispersal of resting spores complicates clubroot management using fumigants.
B. D. GOSSEN (1), T. Cramner (2), J. Robson (2), A. Deora (3), F. Al-Douad (2), S. F. Hwang (4), G. Peng (5), M. R. McDonald (2); (1) Agric & Agri-Food Canada, Saskatoon, SK, Canada; (2) University of Guelph, Guelph, ON, Canada; (3) Syngenta, Guelph, ON, Canada; (4) Alberta Agriculture and Rural Development, Edmonton, AB, Canada; (5) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

264-P Thiophanate-methyl sensitivity of the frogeye leaf spot pathogen in Mississippi.
N. BROCHARD (1), M. Tomaso-Peterson (1), T. Allen (2), J. R. Standish (1); (1) Mississippi State University, Mississippi State, MS, U.S.A.; (2) Mississippi State University, Stoneville, MS, U.S.A.

265-P Fungicide sensitivity of the wheat stripe rust pathogen (*Puccinia striiformis* f. sp. *tritici*).
Z. Kang (1), X. Li (1), A. Wan (1), M. Wang (1), X. CHEN (2); (1) Washington State University, Pullman, WA, U.S.A.; (2) USDA ARS, Pullman, WA, U.S.A.

266-P Biological and genetic characterization of *Botrytis cinerea* isolates from a commercial packinghouse in Pennsylvania.
O. MACARISIN (1), V. L. Gaskins (1), J. Yu (1), W. M. Jurick II (1); (1) USDA ARS - Food Quality Laboratory, Beltsville, MD, U.S.A.

267-P Optimization of a resazurin-based assay testing sensitivity of *Botrytis cinerea* to respiration-inhibitor fungicides.
M. S. OLIVEIRA (1), L. G. Cordova (1), N. A. Peres (1); (1) University of Florida, Wimauma, FL, U.S.A.

268-P WITHDRAWN

269-P Differences in *in vitro* fungicide sensitivity among multiple snow mold species.
K. HOCKEMEYER (1), A. Orshinsky (1); (1) University of Minnesota, St Paul, MN, U.S.A.

270-P Velista® (penthiopyrad) baseline sensitivity of *Sclerotinia homoeocarpa* isolates.
G. OLAYA (1), R. Linley (1), K. Edlebeck (1), M. Agnew (1); (1) Syngenta Crop Protection, Vero Beach, FL, U.S.A.

271-P Fungicide sensitivity characterization of novel ectotrophic root-infecting fungi associated with bermudagrass roots.
G. W. ABLES (1), M. Tomaso-Peterson (1), P. Vines (1), J. R. Standish (1); (1) Mississippi State University, Mississippi State, MS, U.S.A.

272-P The evaluation of a high throughput microtiter plate assay to examine the sensitivity of a soybean oomycete community to mefenoxam and ethaboxam.
Z. A. NOEL (1), A. Rojas (2), J. Jacobs (2), D. McDuffee (3), M. I. Chilvers (2); (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Michigan State University, East Lansing , MI, U.S.A.; (3) Valent USA Corp, Indianapolis, IN, U.S.A.

273-P Sensitivity of *Phytophthora infestans* isolates to the fungicide oxathiapiprolin.
G. OLAYA (1), R. Linley (1), K. Myers (2), W. Fry (2), K. Paul (3), K. Edlebeck (1); (1) Syngenta Crop Protection, Vero Beach, FL, U.S.A.; (2) Cornell University, Ithaca, NY, U.S.A.; (3) Syngenta Crop Protection, Greensboro, NC, U.S.A.

274-P Azoxystrobin-resistant *Rhizoctonia solani* on rice in southwestern Louisiana.
A. LUNOS (1), C. Hollier (1); (1) LSU Dept. of Plant Pathology & Crop Physiology, Baton Rouge, LA, U.S.A.

275-P Distribution of azoxystrobin resistance in nonpathogenic *Alternaria alternata* isolates of citrus.
K. R. NICOLETTA (1), B. Vega (2), M. M. Dewdney (3); (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) DuPont Crop Protection-Discovery, Newark, DE, U.S.A.; (3) Univ of Florida, Lake Alfred, FL, U.S.A.

276-P Phenotypic and genotypic characterization of QoI fungicide resistant *Cercospora sojina*.
H. M. KELLY (1), B. Vega (2); (1) University of Tennessee, Jackson, TN, U.S.A.; (2) DuPont, Newark, DE, U.S.A.

277-P Investigating fungicide resistance in potato early blight complex pathogens in Wisconsin.
S. DING (1), S. Jordan (1), K. Cleveland (1), K. Fairchild (2), P. Wharton (3), A. Gevens (4); (1) University of Wisconsin, Madison, WI, U.S.A.; (2) University of Idaho, Aberdeen, ID, U.S.A.; (3) University of Idaho, Aberdeen , ID, U.S.A.; (4) Univ of Wisconsin, Madison, WI, U.S.A.

278-P First report of resistance to azoxystrobin in *Phytophthora cactorum* on strawberry.
T. SEIJO (1), E. Zuchelli (2), N. A. Peres (3); (1) Univ of Florida - GCREC IFAS, Wimauma, FL, U.S.A.; (2) Universidade de Passo Fundo, Passo Fundo, Brazil; (3) University of Florida, Wimauma, FL, U.S.A.

279-P Genetics governing the differential response to boscalid of *Microsphaeropsis tanaceti* and *Stagonosporopsis tanaceti*.
J. SCOTT (1), T. Pearce (1), S. Pilkington (1), F. Hay (1), C. Wilson (2); (1) Tasmania Institute of Agriculture, Burnie, Australia; (2) Tasmania Institute of Agriculture, Hobart, Australia

280-P Sub-lethal doses of fungicide induce resistance emergence in *Sclerotinia sclerotiorum*.
B. S. AMARADASA (1), S. Everhart (1); (1) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

281-P Functional characterization of oxygenases involved in metabolic detoxification of fungicides in Sclerotinia homoeocarpa.
J. P. HULVEY (1), A. Emerson (2), R. Krishnankutty (3), H. Sang (1), G. Jung (1); (1) University of Massachusetts, Amherst, MA, U.S.A.; (2) VIT University, Vellore, Tamil Nadu, India; (3) Weill Cornell Medical College in Qatar, Doha, Qatar

282-P Population dynamics and molecular mechanisms of DMI resistance in cucurbit gummy stem blight fungi.
H. X. LI (1), K. L. Stevenson (2), H. Sanders (2), M. T. Brewer (1); (1) University of Georgia, Athens, GA, U.S.A.; (2) University of Georgia, Tifton, GA, U.S.A.

283-P Application of phosphite inhibits growth of plant fungal pathogens and primes plant defense response.
U. GILL (1), K. Mysore (1); (1) The Samuel Roberts Noble Foundation, Ardmore, OK, U.S.A.

284-P Optimization and characterization of the oil in water (O/W) nano emulsion in control of citrus huanglongbing.
C. Yang (1), M. Zhang (2), Y. Duna (3), R. G. Shatter (3), C. A. POWELL (1); (1) IRREC-IFAS, University of Florida, Fort Pierce, FL, U.S.A.; (2) Univ of Florida, Fort Pierce, FL, U.S.A.; (3) USHRL,USDA-ARS, Fort Pierce, FL, U.S.A.

285-P Influence of application technology on foliar fungicide efficacy on *Cercospora sojina* infected soybean.
S. BUTLER (1), H. Young-Kelly (2); (1) Univ of Tennessee, Jackson, TN, U.S.A.; (2) University of Tennessee Extension, Jackson, TN, U.S.A.

286-P RNA as fungicide: Towards an RNAi-based non-transgenic control of plant diseases.
K. H. KOGEL (1), A. Koch (2); (1) Justus Liebig University Giessen, Giessen, Germany; (2) Justus Liebig University, Giessen, Germany

287-P Assessing the reliability of fungicide *in vitro* assays to predict whole-plant control of *Zymoseptoria tritici* on wheat.
J. A. DELGADO (1), C. J. Klittich (1); (1) Dow AgroSciences, Indianapolis, IN, U.S.A.

288-P The best timing of fungicide applications for control of narrow brown leaf spot of rice in main and ratoon crops.
S. S. UPPALA (1), X. G. Zhou (1); (1) Texas A&M AgriLife Research, Beaumont, TX, U.S.A.

289-P Optimizing fungicide application intervals based on airborne *Erysiphe necator* (grape powdery mildew) inoculum concentration.
L. THIESSEN (1), W. Mahaffee (2); (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.

290-P Evaluation of a strawberry powdery mildew risk index (Broome-modified Gubler-Thomas grape powdery mildew index) to time fungicide applications.
M. L. LEBLANC (1), O. Cuevas (1), K. Coons (2), J. C. Broome (3); (1) Pacific Ag Research, San Luis Obispo, CA, U.S.A.; (2) Driscoll's, Santa Maria, CA, U.S.A.; (3) Driscoll's, Watsonville, CA, U.S.A.

291-P Low-volume spray technology for control of major diseases of strawberry in Florida.
L. G. CORDOVA (1), B. W. Hammons (1), N. A. Peres (1); (1) University of Florida, Wimauma, FL, U.S.A.

292-P Evaluation of rotation and tank-mixture programs for gray mold management in strawberry.
A. ZUNIGA (1), A. Amiri (2), N. A. Peres (2); (1) University of Florida, Wimauma , FL, U.S.A.; (2) University of Florida, Wimauma, FL, U.S.A.

293-P Performance of plant virus nanoparticle formulated abamectin in a range of soil types and application conditions against nematodes.
R. H. GUENTHER (1), C. H. Opperman (2), S. A. Lommel (3), D. L. Lindbo (4), J. P. Kerns (2), T. L. Sit (2); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) North Carolina State University Department of Plant Pathology, Raleigh, NC, U.S.A.; (3) North Carolina State University College of Agriculture and Life Sciences, Raleigh, NC, U.S.A.; (4) North Carolina State University Department of Soil Science, Raleigh, NC, U.S.A.

294-P Inhibition of *Phytophthora* spp. by silver nanoparticles synthesized using aqueous extract of *Artemisia absinthium*.
G. S. ALI (1), M. Ali (2), D. Norman (2), M. Brennan (2); (1) Univ of Florida, Apopka, FL, U.S.A.; (2) University of Florida, Apopka, FL, U.S.A.

Cultural Control

295-P Integration of crop rotations and fertility to enhance soil health, plant health, and disease management in Michigan potato production.
N. ROSENZWEIG (1), K. Steinke (1), L. Steere (1), W. W. Kirk (1); (1) Michigan State University, East Lansing, MI, U.S.A.

296-P Influence of silicon on the development of anthracnose disease on grain sorghum.
S. POKHREL (1); C. Hollier (1), (1) Louisiana State Univ Agricultural Center, Baton Rouge, LA, U.S.A.

297-P Examining the suppression of charcoal rot of soybean with secondary nutrients.
T. WILKERSON (1), M. Tomaso-Peterson (2), B. Golden (3), S. Lu (4), A. Brown (5), T. Allen (6); (1) Mississippi State Univ, Greenville, MS, U.S.A.; (2) Mississippi State University, Mississippi State, MS, U.S.A.; (3) Mississippi State University-Delta research and Extension Center, Stoneville, MS, U.S.A.; (4) Mississippi State Univ, Mississippi State, MS, U.S.A.; (5) Mississippi State University, Starkville, MS, U.S.A.; (6) Mississippi State University, Stoneville, MS, U.S.A.

298-P Potassium-modulated photosynthetic performance of mango plants infected by *Ceratocystis fimbriata*.
I. S. Cacique (1), W. M. S. Bispo (1), L. Araujo (1), C. E. Aucique-Perez (1), J. A. Rios (1), L. C. Silva (1), F. A. RODRIGUES (2); (1) UFV, Viçosa, Brazil; (2) Univ Federal De Vicosa, Vicosa, Brazil

299-P Potassium and phosphorus effects on disease severity of charcoal rot of soybean.
A. Mengistu (1), A. MENGISTU (1), X. Yin (2), N. Bellaloui (3), A. M. McClure (2), D. D. Tyler (2), K. N. Reddy (4); (1) USDA ARS, Jackson, TN, U.S.A.; (2) University of Tennessee, Jackson, TN, U.S.A.; (3) USDA-ARS, Jackson, TN, U.S.A.; (4) USDA-ARS, Stoneville, MS, U.S.A.

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302-P Nitrogen nutrition impact on incidence of rhizoctonia infection of *Agrostis stolonifera*.
B. BLACK (1), B. D. Geary (1), B. G. Hopkins (1); (1) Brigham Young University, Provo, UT, U.S.A.

303-P Integration of a spring-planted mustard cover crop and mustard seed meal for control of Verticillium wilt in chile pepper.
S. SANOGO (1), P. Lujan (1), R. Rudolph (1), M. Uchanski (1), S. Walker (1), E. Tahtamouni (1); (1) New Mexico State Univ, Las Cruces, NM, U.S.A.

304-P Deficient, adequate and excess growth curves (N, P, and K) established in hydroponics for biotic and abiotic stress-interaction studies in lettuce.
D. K. JACOBSON (1), B. D. Geary (2), G. T. Myers (2), O. J. Taylor (2); (1) Brigham Young University, Orem, UT, U.S.A.; (2) Brigham Young University, Provo, UT, U.S.A.

305-P Factors influencing the survival of *Fusarium oxysporum* f. sp. *lactucae* on crop residue.
K. R. PAUGH (1), T. R. Gordon (1); (1) UC Davis, Davis, CA, U.S.A.

306-P Influence of cropping practices and soil characteristics on the presence and abundance of plant-parasitic nematodes in corn fields in Ohio.
A. C. Simon (1), T. L. Niblack (1), P. A. PAUL (1); (1) The Ohio State University, Columbus, OH, U.S.A.

307-P Pathogen response to altering levels of soil fertility in soybean fields across Ohio.
M. EYRE (1), C. Martin (2), S. Culman (2), A. Dorrance (2); (1) The Ohio State University, Westlake, OH, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.

308-P Effect of a single application of factory waste lime on Aphanomyces root rot of sugar beet after ten years.
A. K. CHANDA (1), C. E. Windels (1), A. L. Sims (2), J. R. Brantner (1); (1) Department of Plant Pathology, University of Minnesota, Crookston, MN, U.S.A.; (2) University of Minnesota, Northwest Research and Outreach Center, Crookston, MN, U.S.A.

309-P Effect of waste lime on Aphanomyces damping-off of sugar beet in soils over a wide range of pH.
J. R. BRANTNER (1), E. A. Crane (2), A. K. Chanda (1); (1) Department of Plant Pathology, University of Minnesota, Crookston, MN, U.S.A.; (2) Department of Plant Pathology, North Dakota State University, Fargo, ND, U.S.A.

310-P WITHDRAWN

Genetics of Resistance

311-P Identification of novel avirulence genes through screening gain-of-virulence mutants of *Magnaporthe oryzae*.
D. TATE (1), J. Hu (1), T. Mitchell (1); (1) The Ohio State University, Columbus, OH, U.S.A.

312-P Quick survey of avirulence genes in field isolates of *Magnaporthe oryzae* in the past 60 years.
X. WANG (1), T. Bianco (2), M. Lin (2), Y. Wamishe (3), Y. Jia (2); (1) Rice Research and Extension Center, Division of Agriculture, University of Arkansas, Stuttgart, AR, U.S.A.; (2) USDA, ARS, Dale Bumpers National Rice Research Center, Stuttgart, AR, U.S.A.; (3) Cooperative Extension Service, Division of Agriculture, University of Arkansas, Stuttgart, AR, U.S.A.

(continued)

313-P Identifying novel resistance sources for bacterial diseases of rice in West Africa.

A. BOSSA-CASTRO (1), C. Raghavan (2), E. E. Delorean (3), C. M. Vera Cruz (4), H. Leung (2), G. Mosquera (5), V. Verdier (6), J. E. Leach (7); (1) Colorado State Univ, Fort Collins, CO, U.S.A.; (2) International Rice Research Institute (IRRI), Los Baños, Philippines; (3) Colorado State University, Fort Collins, CO, U.S.A.; (4) Intl Rice Research Inst, Metro Manila, Philippines; (5) International Center for Tropical Agriculture (CIAT), Palmira, Colombia; (6) Institut de Recherche pour le Développement, Montpellier, France; (7) Colorado State University, Ft. Collins, CO, U.S.A.

314-P Mapping of unique and broad spectrum resistance genes to *Zymoseptoria tritici* in durum wheat.

L. AOUINI (1), M. Maccaferri (2), R. Tuberosa (2), A. Prodi (2), S. Stefanelli (2), S. Hamza (3), G. H. Kema (4); (1) Plant Research International-Wageningen University, Wageningen , Netherlands; (2) DISTA, Viale Fanin 44, University of Bologna, 40127 Bologna, Italy, Bologna , Italy; (3) National Institute of Agronomy of Tunisia, INAT, 43 Avenue Charles Nicolle, 1082 Tunis, Tunisia., Tunis, Tunisia; (4) Plant Research International B.V., 6700 AA Wageningen, The Netherlands, Wageningen, Netherlands

315-P Mapping stem rust resistance genes in 'Kingbird'.

K. GAMBONE (1), I. Fuentes-Bueno (2), R. Bowden (2); (1) Kansas State University, Manhattan, KS, U.S.A.; (2) USDA-ARS Hard Winter Wheat Genetics Research Unit, Manhattan, KS, U.S.A.

316-P Molecular analysis of host resistance and pathogenicity of rice blast in East Africa.

E. MGONJA (1), G. L. Wang (1), M. Bellizzi (1); (1) The Ohio State University, Columbus, OH, U.S.A.

317-P Identification of candidate genes in a major QTL for resistance to *Fusarium graminearum*.

C. R. GEDLING (1), B. Acharya (2), B. J. Cassone (3), S. Lee (4), R. Mian (3), L. K. McHale (5), A. P. Michel (1), A. E. Dorrance (1); (1) The Ohio State University, Wooster, OH, U.S.A.; (2) Virginia Tech University, Blacksburg, VA, U.S.A.; (3) The Ohio State University, Wooster , OH, U.S.A.; (4) North Carolina State University, Raleigh , NC, U.S.A.; (5) The Ohio State University, Columbus , OH, U.S.A.

318-P QTL analysis of minor gene resistance to leaf rust in the CIMMYT spring wheat cultivar, 'Roelfs F2007'.

J. P. HAHN (1), I. Fuentes-Bueno (2), R. L. Bowden (2); (1) Kansas State University, Manhattan, KS, U.S.A.; (2) USDA-ARS Hard Winter Wheat Genetics Research Unit, Manhattan, KS, U.S.A.

319-P RNA-Seq reveals sorghum candidate genes associated with charcoal rot resistance.

A. Y. BANDARA (1), D. K. Weerasooriya (2), S. Liu (2), C. R. Little (2); (1) Kansas State Univ, Manhattan, KS, U.S.A.; (2) Kansas State University, Manhattan, KS, U.S.A.

320-P Detection of adult plant resistance (APR) to *Puccinia triticina* in native wheat species, transfer and mapping in wheat.

B. KALIA (1), R. P. SINGH (2), R. L. BOWDEN (3), E. EDAE (1), J. POLAND (1), B. S. GILL (1); (1) KANSAS STATE UNIVERSITY, Manhattan, KS, U.S.A.; (2) CIMMYT, El Batan, U.S.A.; (3) USDA-ARS, Manhattan, KS, U.S.A.

321-P Discovery of blueberry genes for mummy berry resistance.

J. POLASHOCK (1), K. Shim (2), T. Smolinski (2); (1) USDA ARS, Chatsworth, NJ, U.S.A.; (2) Delaware State University, Dover, DE, U.S.A.

322-P QTL mapping for Charcoal Rot resistance in soybean.

M. P. DA SILVA (1), P. Chen (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.

323-P Multiple disease resistance in dry edible pinto bean breeding lines obtained by marker-assisted selection.

J. S. PASCHE (1), R. S. Lamppa (2), J. M. Osorno (2), P. Miklas (3); (1) North Dakota State Univ, Fargo, ND, U.S.A.; (2) North Dakota State University, Fargo, ND, U.S.A.; (3) USDA-ARS, Prosser, WA, U.S.A.

324-P Development of molecular markers for downy mildew (race F of *Phytophthora phaseoli*) resistance in lima bean.

T. T. MHORA (1), R. J. Wisser (2), T. A. Evans (3), E. G. Ernest (4), M. E. Patzoldt (2), N. F. Gregory (3), N. M. Donofrio (3); (1) Univ of Delaware, Newark, DE, U.S.A.; (2) University of Delaware, NEWARK, DE, U.S.A.; (3) University of Delaware, Newark, DE, U.S.A.; (4) University of Delaware Carvel Research and Education Center, Georgetown, DE, U.S.A.

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326-P Fine mapping of *Rsv4* gene and identification of SNP markers for soybean mosaic virus resistance.

M. KLEPADLO (1), P. Chen (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.

327-P Identification of a new allele at the *Rsv4* locus for resistance to soybean mosaic virus in VIR 2980 soybean accession.

M. KLEPADLO (1), P. Chen (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.

328-P Identification and evaluation of SNP and SCAR markers linked to the Ry_{cbc} gene for resistance to *Potato virus Y* in diploid potato populations.

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

329-P Effectiveness of rice bacterial blight *R* gene *Xa4* decreased with increase of drought and high temperature stresses.

G. S. C. Dossa (1), I. Quibod (1), A. Henry (1), R. Torres (1), A. Kumar (2), R. Oliva (1), E. Maiss (3), K. Wydra (4), J. E. Leach (5), C. M. VERA CRUZ (1); (1) Intl Rice Research Inst, Metro Manila, Philippines; (2) Intl Rice Research Inst, Hyderabad, India; (3) Leibniz Universität Hannover, Hannover, Germany; (4) Erfurt University of Applied Sciences, Erfurt, Germany; (5) Colorado State University, Ft. Collins, CO, U.S.A.

330-P Influence of Fruit age on Phytophthora fruit rot development on susceptible and resistant watermelon germplasm.

C. S. KOUSIK (1), J. L. Ikerd (2), W. W. Turechek (3); (1) USDA ARS, Charleston, SC, U.S.A.; (2) U.S. Vegetable Laboratory, USDA, ARS, Charleston, SC, U.S.A.; (3) Horticulture Research Laboratory, USDA-ARS, Fort Pierce, FL, U.S.A.

331-P CI5791 is a barley line that harbors high levels of resistance to *Pyrenophora teres* f. *teres,* causal agent of net form net blotch (NFNB).

V. M. KOLADIA (1), J. D. Faris (2), R. S. Brueggeman (1), T. L. Friesen (3); (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (2) Cereal Crops Research Unit, Northern Crops Science Laboratory, USDA-ARS, Fargo, ND, U.S.A.; (3) North Dakota State University, Department of Plant Pathology; Cereal Crops Research Unit, Northern Crops Science Laboratory, USDA-ARS, Fargo, ND, U.S.A.

332-P Exploring De Novo Specificity: The *Pyrenophora tritici-repentis*-barley interaction.

R. ABOUKHADDOUR (1); (1) Univ of Alberta, Edmonton, AB, Canada

333-P Utilization of differential line and vegetative compatibility group methods for the characterization of isolates of *Magnaporthe oryzae* from Africa.

F. ROTICH (1), S. Mutiga (1), C. Feng (1), J. Harvey (2), D. Silué (3), D. Tharreau (4), T. Mitchell (5), G. L. Wang (5), N. Talbot (6), J. Correll (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) Biosciences eastern and central Africa (BecA)-ILRI Hub, Nairobi, Kenya; (3) Africa Rice center (AfricaRice), Cotonou, Benin; (4) French Agricultural Research Center for International Development (CIRAD), Montpellier, France; (5) The Ohio State University, Columbus, OH, U.S.A.; (6) University of Exeter, Exeter, United Kingdom

334-P Genetic relationships between race nonspecific and race specific interactions in the wheat-*Pyrenophora tritici-repentis* pathosystem.
G. KARIYAWASAM (1), A. H. Carter (2), J. B. Rasmussen (1), J. D. Faris (3), S. S. Xu (3), M. Mergoum (1), Z. Liu (4); (1) North Dakota State University, Fargo, ND, U.S.A.; (2) Washington State University, Pullman, WA, U.S.A.; (3) USDA-ARS, Northern Crop Science Laboratory, Fargo, ND, U.S.A.; (4) North Dakota State Univ, Fargo, ND, U.S.A.

335-P Single race screening nurseries elucidate race-specificity involved in adult plant resistance to stem rust in wheat cultivar Thatcher.
M. ROUSE (1), J. Briggs (2); (1) USDA ARS Cereal Disease Lab, St Paul, MN, U.S.A.; (2) University of Minnesota, St Paul, MN, U.S.A.

336-P Strategies for durable resistance to the grapevine powdery mildew fungus, *Erysiphe necator*.
L. CADLE-DAVIDSON (1); (1) USDA ARS GGRU, Geneva, NY, U.S.A.

337-P Why is clubroot on canola more severe in Alberta than in Ontario, Canada?
M. R. MCDONALD (1), A. Deora (2), F. Al-Daoud (3), B. D. Gossen (4); (1) Univ of Guelph, Guelph, ON, Canada; (2) Syngenta, Guelph, ON, Canada; (3) University of Guelph, Guelph, ON, Canada; (4) Agriculture and Agri-Food Canada, Saskatoon , SK, Canada

338-P Reaction of detached leaves of different varieties of sweet orange (*Citrus sinensis* L. Osbeck) to inoculation with *Xanthomonas citri* subsp. *citri* (ex Hasse) Gabriel et al.
A. M. Goncalves-Zuliani (1), K. A. Kern (2), J. Belasque Jr (3), C. A. Zanutto (1), H. T. Hashiguti (2), C. V. Nakamura (2), C. H. Bock (4), W. M. C. NUNES (5); (1) State University of Maringa, Maringa, Brazil; (2) State University of Maringa, maringa, Brazil; (3) State University of Sao Paulo, Piracicaba, Brazil; (4) USDA, Byron, GA, U.S.A.; (5) Univ Estadual de Maringa, Maringa, Brazil

339-P Resistance evaluation of Pera (*Citrus sinensis*) genotypes to citrus canker in greenhouse conditions.
A. M. Goncalves-Zuliani (1), P. T. NOCCHI (1), A. A. Frias (1), D. S. Nanami (1), L. S. Soares (1), H. S. Souza (1), C. H. Bock (2), W. M. Nunes (1); (1) Univ Estadual de Maringa, Maringa, Brazil; (2) USDA, Byron, GA, U.S.A.

340-P Resistance of sweet orange Pera (*Citrus sinensis*) genotypes to *Xanthomonas citri* subsp. *citri* under field conditions.
A. M. Goncalves-Zuliani (1), D. S. NANAMI (1), P. T. Nocchi (1), A. A. Frias (1), J. G. Franco (1), C. A. Zanutto (1), C. H. Bock (2), W. M. Nunes (1); (1) Univ Estadual de Maringa, Maringa, Brazil; (2) USDA, Byron, GA, U.S.A.

341-P Study of new grapefruit cybrids for potential citrus canker resistance in Florida.
M. M. MURATA (1), C. D. Chase (1), A. A. Omar (2), J. Grosser (2), J. H. Graham (2); (1) University of Florida, Gainesville, FL, U.S.A.; (2) Citrus Research and Educational Center (CREC) - University of Florida, Lake Alfred, FL, U.S.A.

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344-P Evaluating peanut varieties for resistance to *Sclerotinia sclerotiorum*.
P. LUJAN (1), S. Sanogo (2), N. Puppala (3); (1) New Mexico State Univ, Las Cruces, NM, U.S.A.; (2) New Mexico State University, Las Cruces, NM, U.S.A.; (3) New Mexico State University, Clovis, NM, U.S.A.

345-P Resistance in pea to the root rot pathogen *Fusarium avenaceum*.
L. D. PORTER (1); (1) USDA ARS, Prosser, WA, U.S.A.

346-P Evaluating soybean cultivars for resistance to Phomopsis seed decay in Mississippi.
S. LI (1), G. Sciumbato (2); (1) USDA ARS CGRU, Stoneville, MS, U.S.A.; (2) Mississippi State University, Stoneville, MS, U.S.A.

347-P Susceptibility of apple germoplasm to Silverleaf disease (*Chondrostereum purpureum*) and effects in fruit yield and quality.
D. E. GRINBERGS (1), R. A. France (1), R. J. Chilian (1); (1) Inst de Investigaciones Agropecuarias, Chillan, Chile

348-P Differential response of sugar maple cultivars to anthracnose.
A. K. HAGAN (1), K. Conner (2); (1) Auburn Univ, Auburn, AL, U.S.A.; (2) Auburn University, Auburn, AL, U.S.A.

349-P A simple and convenient detached leaf assay using mycelium as inoculum for assessing genotype resistance to boxwood blight.
H. GUO (1), R. T. Olsen (2), M. R. Pooler (2); (1) USDA/ARS U.S. National Arboretum / Rutgers Univ., Beltsville, MD, U.S.A.; (2) USDA/ARS U.S. National Arboretum, Beltsville, MD, U.S.A.

350-P Characterization of a sunflower (*Helianthus annuus* L.) germplasm collection for resistance to Phomopsis stem canker and adaptation in South Dakota.
J. Feng (1), K. Grady (1), X. Gu (1), F. MATHEW (1); (1) South Dakota State University, Brookings, SD, U.S.A.

351-P Virulence of *Fusarium oxysporum* f.sp. *cubense* on selected banana cultivars in the Philippines.
M. H. Juruena (1), A. B. MOLINA (2), T. U. Dalisay (3), M. P. Natural (4), C. M. Protacio (5); (1) Office of the Provincial Agriculturist, Tagum City, Philippines; (2) Bioversity Intl, Laguna, Philippines; (3) Department of Plant pPathology, University of the Philippines Los Banos, Los Banos, Philippines; (4) Department of Plant Pathology, University of the Philippines Los Banos, Los Banos, Philippines; (5) Department of Horticulture, University of the Philippines Los Banos, Los Banos, Philippines

352-P Evaluation of perennial ryegrass cultivars for Klendusity to Ergot.
N. KAUR (1), J. Dung (2), S. Alderman (3), D. Walenta (4), K. Frost (1), P. Hamm (1); (1) Hermiston Agricultural Research and Extension Center Oregon State University, Hermiston, OR, U.S.A.; (2) Central Oregon Agricultural Research Center Oregon State University, Madras, OR, U.S.A.; (3) USDA ARS Forage Seed and Cereal Research, Corvallis, OR, U.S.A.; (4) Union County Extension Service Oregon State University, LaGrande, OR, U.S.A.

353-P Performance of some lines of pepper (*Capsicum*) species under natural foliar infection in Nigeria.
C. G. AFOLABI (1), O. A. Oladipupo (1), E. I. Ayo-John (1), A. W. Salau (1), A. R. Afolabi (1), I. A. Kehinde (1); (1) Federal University of Agriculture, Abeokuta, Nigeria

354-P Resistant wild watermelon rootstocks for managing root-knot nematodes in grafted watermelon.
J. A. THIES (1), A. Levi (1); (1) USDA, ARS, Charleston, SC, U.S.A.

355-P Evaluation of the common bean *(Phaseolus vulgaris)* core collections for resistance to soybean cyst nematode (*Heterodera glycines*).
L. WEN (1); (1) Univ of Illinois, Urbana, IL, U.S.A.

356-P Screening the NAM parents for resistance to multiple *Pythium* species.
E. R. LERCH (1), A. E. Dorrance (2), A. E. Robertson (1); (1) Iowa State University, Ames, IA, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.

357-P Evaluating poinsettia cultivars for partial resistance to Pythium root rot.
E. LOOKABAUGH (1), B. Shew (1); (1) North Carolina State University, Raleigh, NC, U.S.A.

358-P Powdery mildew resistant cucurbit rootstocks confer tolerance to grafted susceptible watermelon scions.
C. S. KOUSIK (1), J. L. Ikerd (2), R. Hassell (3); (1) USDA ARS, Charleston, SC, U.S.A.; (2) U.S. Vegetable Laboratory, USDA, ARS, Charleston, SC, U.S.A.; (3) Costal Research and Education Center, CREC, Clemson University, Charleston, SC, U.S.A.

359-P WITHDRAWN

360-P Field evaluate tomato varieties for resistance to *Tomato chlorotic spot virus*, an emerging threat to tomato production in South Florida.
S. ZHANG (1), E. McAvoy (2), Q. Wang (3), D. R. Seal (1); (1) TREC - Univ of Florida, Homestead, FL, U.S.A.; (2) UF/IFAS Hendry County Extension, LaBelle, FL, U.S.A.; (3) UF/IFAS Miami-Dade Extension, Homestead, FL, U.S.A.

(continued)

361-P Role of lutein in Fusarium head blight resistance in the DH population Toronit x ACW211.12014.
C. Martin (1), J. Dougoud (1), V. Susanne (2), B. Mauch-Mani (3), F. MASCHER (1); (1) Agroscope IPV, Nyon, Switzerland; (2) Agroscope IDU, Zürich, Switzerland; (3) University of Neuchatel, Neuchatel, Switzerland

362-P Does disease escape cause a trade-off between yield and Septoria in wheat?
C. JUDGE (1), J. Brown (1); (1) John Innes Centre, Norwich, United Kingdom

363-P The gene *HFI1* encoding a transcriptional coactivator in *Fusarium oxysporum* f. sp. *cubense* is required for virulence on banana plants.
M. LI (1), H. Nong (1), Z. Xu (1), X. Xie (1), P. Xi (1), L. Sun (1), Z. Jiang (1); (1) Department of Plant Pathology, South China Agricultural University, Guangzhou, China

364-P WITHDRAWN

365-P Transgenic management of aflatoxin contamination in corn through host induced gene silencing.
Y. RARUANG (1), Q. Wei (2), R. Brown (2), D. Bhatnagar (2), Z. Chen (1); (1) Louisiana State Univ Agric Center, Baton Rouge, LA, U.S.A.; (2) Southern Regional Research Center, USDA-ARS, New Orleans, LA, U.S.A.

366-P Expression of a single-chain antibody recognizing an extracellular loop of the *Candidatus* Liberibacter asiaticus NodT protein in *Citrus* x *paradise*.
T. MCNELLIS (1), J. Sinn (2), V. Orobovic (3), T. Gottwald (4); (1) Penn State Univ, University Park, PA, U.S.A.; (2) The Pennsylvania State University, University Park, PA, U.S.A.; (3) University of Florida, Lake Alfred, FL, U.S.A.; (4) U.S. Horticultural Research Laboratory, USDA ARS, Fort Pierce, FL, U.S.A.

367-P Modifying citrus genome using Cas9/sgRNA.
H. JIA (1), N. WANG (2); (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) Univ of Florida, Lake Alfred, FL, U.S.A.

368-P WITHDRAWN

369-P Antimicrobial activity of plant produced bacteriophage endolysin.
N. KOVALSKAYA (1), J. Foster-Frey (2), D. Donovan (2), G. Bauchan (3), R. W. Hammond (1); (1) USDA-ARS-Molecular Plant Pathology Laboratory, Beltsville, MD, U.S.A.; (2) USDA-ARS-Animal Biosciences and Biotechnology Laboratory, Beltsville, MD, U.S.A.; (3) USDA-ARS-Electron and Confocal Microscopy Unit, Beltsville, MD, U.S.A.

370-P WITHDRAWN

371-P Production of transgenic chrysanthemum events resistant to *Chrysanthemum stunt viroid*.
S. K. CHOI (1), G. S. Choi (1), J. Y. Yoon (1); (1) Virology Unit, Department of Horticultural Environment, National Insititute of Horticultural and Herbal Science, RDA, Wan-Ju, South Korea

Integrated Pest Management

372-P Exploration of alternative fire blight management strategies.
K. PETER (1), T. McNellis (2), B. Lehman (1), S. Klee (2); (1) Penn State University, Biglerville, PA, U.S.A.; (2) Penn State University, University Park, PA, U.S.A.

373-P WITHDRAWN

374-P Field evaluation of Quintec and Actigard for managing bacterial spot and speck on nine fresh market tomato varieties in Florida.
G. E. VALLAD (1), H. Adkison (1), R. Willis (1), S. Newman (1), J. Seibert (1); (1) University of Florida, Wimauma, FL, U.S.A.

375-P Biosynthesis of silver nanoparticles by bacterial endophytes inhabiting Indian medicinal plants.
S. SREEDHARAMUTHY (1), S. Baker (1); (1) University of Mysore, Mysore, India

376-P Using pathogen-tested seedlings and bio-agent to control bacterial wilt of vegetable sweet potato in fields.
Y. J. CHEN (1), H. R. Pan (2), Y. S. Lin (2), W. H. Chung (2); (1) Kaohsiung District Agricultural Research and Extension Station, Taichung, Taiwan; (2) National Chung Hsing University, Taichung, Taiwan

377-P WITHDRAWN

378-P Mycotoxin management in maize (*Zea mays* (L.)) damaged by lepidopteran insects pest.
D. MAYS (1), G. Schuster (2), M. Sétamou (3), P. Porter (4), D. Wester (5), A. Tri (5); (1) Department of Agriculture, Agribusiness, and Environmental Sciences, Texas A&M University-Kingsville, Kingsville, TX, U.S.A.; (2) Texas A&M University - Kingsville, Texas A&M AgriLife Extension, Kingsville, 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) Department of Animal and Wildlife Sciences; Texas A&M University – Kingsville, Kingsville, TX, U.S.A.

379-P Spike colonization, fungal spread and deoxynivalenol accumulation in Fusarium head blight susceptible and resistant wheat cultivars.
J. D. SALGADO (1), L. V. Madden (2), P. A. Paul (2); (1) The Ohio State University, Wooster, OH, U.S.A.; (2) The Ohio State University, wooster, OH, U.S.A.

380-P Development of a predictive model for *Sclerotinia sclerotiorum* apothecial development to control white mold in soybean fields.
J. F. WILLBUR (1), H. Lucas (1), M. Kabbage (1), D. L. Smith (1); (1) University of Wisconsin, Madison, WI, U.S.A.

381-P Weather conditions conducive to infection of winter wheat by *Puccinia striiformis sp. tritici* race 'warrior'.
M. EL JARROUDI (1), L. Kouadio (2), M. El Jarroudi (3), C. H. Bock (4), B. Tychon (5), J. Junk (6), P. Delfosse (6); (1) Univ of Liege, Arlon, Belgium; (2) ICACS, University of Southern Queensland, Toowoomba,, Australia; (3) LMA, FST Tanger, Université Abdelmalek Essaâdi, Tangier, Morocco; (4) USDA-ARS-SEFTNRL, Byron, GA, U.S.A.; (5) Department of Environmental Sciences and Management, Université de Liège, Arlon, Belgium; (6) Luxembourg Institute of Science and Technology (LIST), Belvaux, Luxembourg

382-P Development and optimization of a weather-based decision aid for soybean foliar fungicide applications in Virginia.
H. L. MEHL (1), T. Zhou (1), D. Holshouser (1); (1) Virginia Tech Tidewater AREC, Suffolk, VA, U.S.A.

383-P Organic rice disease management using genetic resistance, cover crop and organic fertilizer.
X. G. ZHOU (1), F. Dou (1), A. M. McClung (2); (1) Texas A&M AgriLife Research, Beaumont, TX, U.S.A.; (2) USDA ARS, Dale Bumpers National Rice Research Center, Stuttgart, AR, U.S.A.

384-P Root removal to improve disease management in replanted Washington red raspberry fields.
J. E. WEILAND (1), I. A. Zasada (2), L. W. DeVetter (3), T. Walters (4), R. Rudolph (3), S. Watkinson (3); (1) USDA ARS, Corvallis, OR, U.S.A.; (2) USDA-ARS, Corvallis, OR, U.S.A.; (3) Washington State University, Mount Vernon, WA, U.S.A.; (4) Walters Ag Research, Anacortes, WA, U.S.A.

385-P Effect of cultivar and cluster maturity on ripe rot of grape caused by *Colletotrichum acutatum* and *Colletotrichum gloeosporioides*.
C. OLIVER (1), M. Nita (2); (1) Virginia Polytechnic Institute and State University, Winchester, VA, U.S.A.; (2) Virginia Tech, Winchester, VA, U.S.A.

386-P A novel approach to control gray mold, anthracnose, and powdery mildew on strawberry using low-dose UV-C irradiation.
W. J. Janisiewicz (1), F. Takeda (1), W. JURICK II (2), B. Nichols (1), S. Wolford (1), D. M. Glenn (1); (1) USDA-ARS, AFRS, Kearneysville, WV, U.S.A.; (2) USDA ARS - Food Quality Laboratory, Beltsville, MD, U.S.A.

387-P MyIPM, a new smartphone application to help implement IPM concepts for fruit growers.
G. SCHNABEL (1), M. j. Hu (2), G. Edison (2), R. Pargas (2); (1) Clemson Univ, Clemson, SC, U.S.A.; (2) Clemson University, Clemson, SC, U.S.A.

388-P Relationship of hydrophobicity of powdery mildew conidia to self-cleaning properties of strawberry leaves and management of the pathogen with water.
B. ASALF (1), D. M. Gadoury (2), A. Stensvand (3); (1) Norwegian Institute for Agricultural and Environmental Research (Bioforsk), Aas, Norway; (2) Cornell University, Geneva, NY, U.S.A.; (3) Bioforsk Norwegian Inst of Agric & Env Res, Aas, Norway

389-P Soybean root rot, Rhizoctonia communities and their relation with other microbes and nematode communities.
B. LIU (1), H. Wei (2), W. Shen (2), H. Smith (2), J. Correll (3); (1) Univ of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Nebraska-Lincoln, North Platte, NE, U.S.A.; (3) University of Arkansas, Fayetteville, AR, U.S.A.

390-P Current status and integrated management of Sugarcane brown rust (*Puccinia melanocephala*), and orange rust (*Puccinia kuehnii*) in Colombia.
J. C. Angel (1), J. I. Victoria (1), M. Cadavid (1), C. A. ANGEL (1); (1) Colombian Sugarcane Research Center - CENICAÑA, Cali, Colombia

391-P Anaerobic soil disinfestation amendment carbon rate affects germination and parasitism of sclerotia of *Sclerotium rolfsii*.
U. SHRESTHA (1), M. M. Dee (1), B. H. Ownley (1), D. M. Butler (1); (1) University of Tennessee, Knoxville, TN, U.S.A.

392-P Control of *Pythium ultimum* on cucumber by different composts and biochars in potted plants.
M. Pugliese (1), M. L. GULLINO (2), G. Castella (3), A. Garibaldi (3), M. L. Gullino (4); (1) DISAFA, University of Torino, Italy, Grugliasco, Italy; (2) University of Torino, Grugliasco Torino, Italy; (3) University of Torino, Agroinnova, Grugliasco, Italy; (4) University of Torino, Agroinnova, DISAFA, Grugliasco, YT, Italy

393-P Integrated management of *Rhizoctonia* on sugar beet: What's new?
J. R. Brantner (1), A. K. CHANDA (1); (1) Department of Plant Pathology, University of Minnesota, Crookston, MN, U.S.A.

394-P Improved management of tomato foliar diseases by conventional and organically acceptable products.
M. Rahman (1), M. RAHMAN (2); (1) West Virginia Univ, Morgantown, WV, U.S.A.; (2) West Virginia University, Morgantown, WV, U.S.A.

395-P Optimizing anaerobic soil disinfestation for control of Prunus replant disease.
G. T. BROWNE (1), N. J. Blackburn (2); (1) USDA ARS, Davis, CA, U.S.A.; (2) University of California, Davis, CA, U.S.A.

396-P Integration of apple rootstock genotype with reduced *Brassica* seed meal application rates for replant disease control.
L. WANG (1), M. Mazzola (2); (1) Washington State University, Wenatchee, WA, U.S.A.; (2) USDA-ARS, Wenatchee, WA, U.S.A.

397-P Characterization of apple replant disease-associated microbial communities over multiple growth periods using next-generation sequencing.
A. J. Reed (1), M. MAZZOLA (1); (1) USDA ARS, Wenatchee, WA, U.S.A.

398-P Role of organic amendments and microbial antagonists on the growth and flowering of Zinnia elegans.
R. Badar (1), V. SULTANA (2), J. Ara (3), S. Ehteshamul-Haque (4); (1) Department of Botany, Jinnah University for Women, Karachi, Karachi, Pakistan; (2) Department of Biochemistry, University of Karachi, Karachi, Karachi, Pakistan; (3) Department of Food Science & Technology, University of Karachi, Karachi, Pakistan; (4) Department of Botany, University of Karachi, Karachi, Pakistan

399-P Western Region IR-4: Protecting specialty crops, practicing IPM, promoting global trade.
J. FARRAR (1), R. Hirnyck (2), S. O'Neal (3), R. Sisco (4); (1) Western IPM Center, Davis, CA, U.S.A.; (2) Integrated Pest Management Center, University of Idaho, Boise, ID, U.S.A.; (3) Irrigated Agriculture Research and Extension Center, Washington State University, Prosser, WA, U.S.A.; (4) Western Region IR-4 Center, Davis, CA, U.S.A.

400-P Adoption of IPM practices for disease management in the Western U.S.
J. FARRAR (1), M. Baur (1), S. Elliott (1); (1) Western IPM Center, Davis, CA, U.S.A.

401-P Effective disease management strategies for organic cucumber production.
F. BAYSAL-GUREL (1), S. A. Miller (1); (1) The Ohio State University, Wooster, OH, U.S.A.

402-P Evaluation of fungicides and production methods for the control of downy mildew of cucumber.
F. BAYSAL-GUREL (1), S. A. Miller (1); (1) The Ohio State University, Wooster, OH, U.S.A.

Regulatory Plant Pathology

403-P A new exclusively genome-based species-independent taxonomic framework for all life forms applied to *Pseudomonas syringae*.
B. A. VINATZER (1), H. A. Elmarakeby (1), A. J. Weisberg (1), C. L. Monteil (1), L. S. Heath (1); (1) Virginia Tech, Blacksburg, VA, U.S.A.

404-P New Zealand's "emerging risks system" for biosecurity.
S. Clark (1), M. Newfield (1), C. Reed (2), S. CLARK (1); (1) Ministry for Primary Industries, Wellington, New Zealand; (2) Minsitry for Primary Industries, Wellington, New Zealand

405-P Safeguarding agriculture through nomenclature support and incorporating standard scientific names in national regulatory and extension databases.
B. B. SHEW (1), M. A. Cubeta (1), W. C. Allen (2), L. A. Castlebury (3), E. M. Luke (4), M. A. Hill (4), J. F. Hegarty (4), J. M. McKemy (5), M. K. Romberg (5), B. Randall-Schadel (6), N. Gregory (7); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) North Carolina State University, Beltsville, MD, U.S.A.; (3) USDA ARS Systematic Mycology & Microbiology Lab, Beltsville, MD, U.S.A.; (4) Purdue University, West Lafayette, IN, U.S.A.; (5) USDA ARS SMML, Beltsville, MD, U.S.A.; (6) USDA APHIS CPHST, Raleigh, NC, U.S.A.; (7) University of Delaware, Newark, DE, U.S.A.

406-P Monitoring the spread of *Phytophthora ramorum* at a quarantine site reveals new and rare pathogens of woody plants in Northern California.
T. Pastalka (1), S. Rooney Latham (2), K. Suslow (1), W. SCHWEIGKOFLER (1); (1) Dominican Univ of California, San Rafael, CA, U.S.A.; (2) California Department of Food & Agriculture, Sacramento, CA, U.S.A.

Crop Loss Assessment

407-P Effect of blackleg (*Leptosphaeria maculans*) on yield of *Brassica napus* canola in Alberta, Canada.
S. F. HWANG (1), S. E. Strelkov (2), H. U. Ahmed (3), Q. Zhou (3), G. D. Turnbull (3), G. Peng (4); (1) Alberta Agriculture, Edmonton, AB, Canada; (2) University of Alberta, Edmonton, AB, Canada; (3) Alberta Agriculture and Rural Development, Edmonton, AB, Canada; (4) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

408-P Biofuel traits of sweet sorghum are affected by Fusarium stalk rot and charcoal rot diseases.
A. Y. BANDARA (1), D. K. Weerasooriya (1), T. T. Tesso (1), C. R. Little (1); (1) Kansas State University, Manhattan, KS, U.S.A.

409-P The leaf doctor: A new application for quantifying disease severity.
S. J. PETHYBRIDGE (1), S. C. Nelson (2); (1) Cornell University, Geneva, NY, U.S.A.; (2) University of Hawaii at Manoa, Honolulu, HI, U.S.A.

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Disease Detection and Diagnosis

410-P Novel PCR-mediated assay for detection, identification and quantification of *Clavibacter michiganensis* subsp. *nebraskensis*.
R. R. MCNALLY (1), C. A. Ishimaru (2), D. K. Malvick (2); (1) University of Minnesota, St Paul, MN, U.S.A.; (2) University of Minnesota, St. Paul, MN, U.S.A.

411-P Detection of '*Candidatus* Liberibacter asiaticus' in citrus using tissue prints and anti-OmpA polyclonal antibodies.
F. DING (1), Y. Duan (2), J. Hartung (1); (1) USDA ARS MPPL, Beltsville, MD, U.S.A.; (2) USDA ARS USHRL, Fort Pierce, FL, U.S.A.

412-P Optimization of the detection of viable '*Candidatus*Liberibacter asiaticus' bacterium in citrus tissue.
E. S. LOUZADA (1), O. Vazquez (1), S. J. Schneider (1), M. Kunta (1); (1) Texas A&M University Kingsville, Weslaco, TX, U.S.A.

413-P Detection of a *Ca.*Liberibacter americanus variant in Asian citrus psyllids, *Diaphorina citri*, in Texas.
J. V. DA GRAÇA (1), M. Kunta (1); (1) Texas A&M University Kingsville, Weslaco, TX, U.S.A.

414-P Distribution of '*Ca.*Liberibacter asiaticus' in roots of sour orange rootstock grafted with sweet orange and in leaves of grapefruit trees.
O. Vazquez (1), E. S. Louzada (1), G. Yanev (2), M. Devanaboina (2), M. KUNTA (1); (1) Texas A&M University Kingsville, Weslaco, TX, U.S.A.; (2) The University of Texas - Pan American, Edinburg, TX, U.S.A.

415-P A reliable and highly sensitive, digital PCR-based assay for early detection of citrus Huanglongbing.
K. R. Kremer (1), S. Shi (1), Y. Duan (2), Z. XIONG (1); (1) University of Arizona, Tucson, AZ, U.S.A.; (2) USDA ARS USHRL, Fort Pierce, FL, U.S.A.

416-P Evaluation of isothermal amplification methods for rapid HLB detection.
J. Wang (1), Z. LIU (1), G. Wei (1), W. Li (1), M. Nakhla (1); (1) USDA APHIS PPQ CPHST, Beltsville, MD, U.S.A.

417-P Antibody-based diagnosis of citrus Huanglongbing and stubborn disease using pathogen secreted proteins as detection markers.
D. PAGLIACCIA (1), E. Hawara (1), K. Clark (1), J. Shi (1), A. Mulchandani (2), T. T. Tran (2), G. Vidalakis (1), M. Wenbo (1); (1) University of California, Riverside, Department of Plant Pathology & Microbiology, Riverside, CA, U.S.A.; (2) University of California, Riverside, Department of Chemical and Environmental Engineering, Riverside, CA, U.S.A.

418-P LAMP and multiplex endpoint PCR-based diagnostics for detection and discrimination among *Pseudomonas syringae* pv. *actinidiae* strains.
G. Y. BUSOT (1), M. Arif (1), J. Rascoe (2), M. K. Nakhla (2), J. P. Stack (1); (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.; (2) USDA-APHIS-PPQ CPHST Beltsville Lab, USA, Beltsville, MD, U.S.A.

419-P Detection of viable *Xanthomonas fragariae* cells in strawberry using propidium monoazide and long-amplicon quantitative PCR.
H. WANG (1), W. W. Turechek (2); (1) Univ of Florida/USDA-ARS, Ft Pierce, FL, U.S.A.; (2) USDA-ARS, Ft. Pierce, FL, U.S.A.

420-P A TaqMan-based real-time multiplex PCR assay to detect select agent strains of *Ralstonia solanacearum*.
M. J. STULBERG (1), Q. Huang (2); (1) FNPRU, USDA/ARS, Beltsville, MD, U.S.A.; (2) USDA ARS, Beltsville, MD, U.S.A.

421-P Detection of viable *Acidovorax citrulli* in cucurbit seeds by viability/enrichment PCR.
R. WILLMANN (1), A. Beerepoot (1), B. Woudt (1); (1) Syngenta Seeds, Enkhuizen, Netherlands

422-P Enhancing detection sensitivity and accuracy on "*Candidatus* Liberibacter asiaticus" through Next Generation Sequencing technology.
Z. Zheng (1), X. Deng (1), J. CHEN (2); (1) Department of Plant Pathology, South China Agricultural University, Guangzhou, China; (2) USDA ARS PWA, Parlier, CA, U.S.A.

423-P On site testing for *Clavibacter michiganensis* subsp. *sepedonicus* in potato and environmental samples using loop mediated isothermal amplification.
J. WOODHALL (1), F. Hetherington (1), K. Perkins (1), H. Lekuona (1), K. Fairchild (2), P. S. Wharton (2); (1) Food and Environment Research Agency, York, United Kingdom; (2) University of Idaho, Aberdeen, ID, U.S.A.

424-P Rapid detection of the zebra chip pathogen in infected plants and psyllids using loop mediated isothermal amplification.
P. S. WHARTON (1), J. Woodhall (2), K. Fairchild (3); (1) Univ of Idaho, Aberdeen, ID, U.S.A.; (2) Food and Environment Research Agency, York, United Kingdom; (3) University of Idaho, Aberdeen, ID, U.S.A.

425-P WITHDRAWN

426-P Real-time simultaneous detection of Loop-mediated AMPlification (LAMP) by assimilating probes.
R. KUBOTA (1), D. M. Jenkins (2); (1) Diagenetix, Inc., Honolulu, HI, U.S.A.; (2) Univ of Hawaii At Manoa, honolulu, HI, U.S.A.

427-P Reliable and sensitive detection of *Clavibacter michiganensis* subsp. *michiganensis* and *Salmonella enterica* in greenhouse irrigation water.
F. BAYSAL-GUREL (1), N. Khatri (1), A. Arciniega (1), J. T. LeJeune (1), S. A. Miller (1); (1) The Ohio State University, Wooster, OH, U.S.A.

428-P Enrichment of *Clavibacter michiganensis* subsp. *michiganensis* in tomato seeds extracts.
F. M. V. LELIS (1), J. M. van der Wolf (1); (1) Wageningen University and Research Centre, Wageningen, Netherlands

429-P Development of a PCR-based diagnostic assay for the detection of *Magnaporthe oryzae* (*Triticum* pathotype) from infected wheat.
M. PIECK (1), L. Chen (2), A. Ruck (1), M. L. Farman (2), B. Valent (3), G. Peterson (4), K. F. Pedley (4); (1) USDA-ARS Foreign Disease- Weed Science Research Unit, Ft. Detrick, MD, U.S.A.; (2) Department of Plant Pathology, University of Kentucky, Lexington, KY, U.S.A.; (3) Kansas State University, Department of Plant Pathology, Manhattan, KS, U.S.A.; (4) USDA-ARS Foreign Disease Weed Science Research Unit, Ft. Detrick, MD, U.S.A.

430-P High-throughput single seed PCR detection of *Cephalosporium gramineum* in wheat.
H. SHENG (1), K. L. Klos (2), Z. Sexton (1), T. D. Murray (1); (1) Washington State University, Pullman, WA, U.S.A.; (2) USDA Small Grains and Potato Germplasm Research, Aberdeen, ID, U.S.A.

431-P Quantification of *Puccinia striiformis* f. sp. *tritici* in urediniospores and infected wheat leaves using real-time quantitative PCR of DNA and RNA.
X. P. HU (1), L. J. Ma (2), B. T. Wang (3), Z. S. Kang (3), X. M. Xu (4); (1) Northwest A&F University, Yangling, China; (2) Northwest A&F University, YanglingY, China; (3) Northwest A&F University, Yangling, Shaanxi, China; (4) East Malling Research, East Malling, United Kingdom

432-P Detection of Speck rot on Pink Lady apple fruit in the Maule Region in Chile.
G. A. DIAZ (1), B. A. Latorre (2), J. P. Zoffoli (2), M. Caceres (1), R. Mendez (1), M. Lolas (1); (1) Universidad de Talca, Talca, Chile; (2) Pontificia Universidad Catolica de Chile, Santiago, Chile

433-P Macroarray detection and identification of young vine decline fungal pathogens.
J. R. URBEZ TORRES (1), P. Haag (1), D. O'Gorman (1); (1) Pacific Agri-Food Research Centre / Agriculture and Agri-Food Canada, Summerland, BC, Canada

434-P Detection of *Ceratocystis fimbriata* in mango trees and soil.
G. P. CAVALCANTE (1), R. A. Brito (2), L. A. Maffia (1); (1) Univ Federal De Vicosa, Vicosa, Brazil; (2) Universidade Federal de Vicosa, Vicosa, Brazil

435-P Genetic approaches to identifying pathogens causing root rot problems of common bean.
J. R. STEADMAN (1), G. Godoy-Lutz (2), C. Mukuma (2), S. V. Fernandes (2); (1) Univ of Nebraska, Lincoln, NE, U.S.A.; (2) University of Nebraska, Lincoln, NE, U.S.A.

436-P A Rapid and Reliable Isothermal Diagnostic Assay for Detecting Soybean Sudden Death Syndrome (SDS) Pathogen *Fusarium virguliforme*.
M. G. ROTH (1), A. Rojas (2), J. Wang (1), M. I. Chilvers (1); (1) Michigan State University, East Lansing, MI, U.S.A.; (2) Michigan State University, East Lansing , MI, U.S.A.

437-P A novel approach to using PCR-GBS in survey data.
K. ZITNICK-ANDERSON (1), K. Simons (2), J. Pasche (2); (1) North Dakota State Univ, Moorhead, MN, U.S.A.; (2) North Dakota State Univ, Fargo, ND, U.S.A.

438-P Evaluation of methods to detect the cotton pathogen *Fusarium oxysporum* f. sp. *vasinfectum* race 4.
F. K. CRUTCHER (1), H. Doan (2), A. A. Bell (3), R. M. Davis (2), R. L. Nichols (4), J. Liu (3); (1) USDA - ARS, College Station, TX, U.S.A.; (2) University of California, Davis, CA, U.S.A.; (3) USDA-ARS, College Station, TX, U.S.A.; (4) Cotton Incorporated, Cary, NC, U.S.A.

439-P A bioassay method for detection and quantification of latent infections of *Colletotrichum* spp. in olive fruits.
J. Romero (1), F. Cherifi (2), A. E. Santa-Barbara (1), J. MORAL (3), L. F. Roca-Castillo (1), A. Trapero-Casas (1); (1) Univ. de Cordoba, Cordoba, Spain; (2) Univ. de Cordoba, Córdoba, Spain; (3) Univ De Cordoba, Cordoba, Spain

440-P Development of a detection method for the survey of the oak pathogens *Diplodia corticola* and *D. quercivora* in Florida.
T. DREADEN (1), J. A. Smith (2); (1) , Gainesville, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.

441-P Development of TaqMan probe-based insulated isothermal PCR (iiPCR) for detection of *Fusarium oxysporum* f. sp. *cubense* race 4.
Y. J. Lin (1), J. C. Hsu (1), Y. H. Chiu (1), L. L. Hong (1), T. D. Chang (1), P. F. L. Chang (2), Y. H. LIN (1); (1) Dept. of Plant Medicine, National Pingtung University of Science and Technology, Pingtung County, Taiwan; (2) Dept. of Plant Pathology, National Chung Hsing University, Taichung City, Taiwan

442-P Molecular detection of rust fungi on turfgrass.
B. KARAKKAT (1), V. Jackson (1), P. Koch (1); (1) University of Wisconsin-Madison, Madison, WI, U.S.A.

443-P Development of a quantitative loop-mediated isothermal amplification assay to detect *Magnaporthe oryzae* airborne inoculum in turf ecosystems.
C. VILLARI (1), W. F. Mahaffee (2), T. K. Mitchell (1), K. F. Pedley (3), M. Pieck (3), F. Peduto Hand (1); (1) Department of Plant Pathology, The Ohio State University, Columbus, OH, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.; (3) USDA ARS, Fort Detrick, MD, U.S.A.

444-P Optimization of sample processing for qPCR detection of silver scurf and black dot on potatoes.
J. CRANE (1), A. Gevens (2); (1) Univ of Wisconsin, Madison, WI, U.S.A.; (2) University of Wisconsin, Madison, WI, U.S.A.

445-P Insect E-probe Diagnostic Nucleic acid Analysis (EDNA): a novel bioinformatic tool for detection of vectors and pathogens in insect trap metagenomes.
W. SCHNEIDER (1), A. Stone (2), D. Sherman (2), M. Malapi-Wight (3), J. Crouch (3), S. Andreason (4), J. Daniels (4), A. Wayadande (4), F. Ochoa-Corona (4); (1) USDA ARS FDWSRU, Ft. Detrick, MD, U.S.A.; (2) USDA ARS FDWSRU, Ft Detrick, MD, U.S.A.; (3) USDA ARS SMML, Beltsville, MD, U.S.A.; (4) Oklahoma State University, Stillwater, OK, U.S.A.

446-P A systematic approach to develop species-specific markers for *Phytophthora* spp. using a mitochondrial locus.
T. D. MILES (1), G. Robideau (2), F. N. Martin (3), G. Bilodeau (2), M. Coffey (4); (1) California State University Monterey Bay, Seaside, CA, U.S.A.; (2) Canadian Food Inspection Agency, Ottawa, ON, Canada; (3) USDA-ARS, Salinas, CA, U.S.A.; (4) UC Riverside, Riverside, CA, U.S.A.

447-P Development and evaluation of molecular methods for specific detection of *Phytophthora alni* subsp. *alni* and *P. alni* subsp. *multiformis*.
J.C. BIENAPFL (1) USDA APHIS PPQ S&T, Beltsville, MD, U.S.A.

448-P Development and evaluation of molecular methods for species-specific detection of *Phytophthora quercina*.
J. C. BIENAPFL (1), Z. G. Abad (1), L. M. Knight (1), M. J. Sullivan (2), M. K. Nakhla (1); (1) USDA APHIS PPQ S&T, Beltsville, MD, U.S.A.; (2) USDA APHIS PPQ S&T, Fort Collins, CO, U.S.A.

449-P Detection of spinach downy mildew during latent infection.
C. S. SUBBARAO (1), A. Anchieta (2), K. V. Subbarao (3), S. J. Klosterman (2); (1) Salinas High School, Salinas, CA, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.; (3) University of California, Davis, Davis, CA, U.S.A.

450-P Development of an assay for rapid detection of the lettuce downy mildew pathogen, *Bremia lactucae*.
S. G. KUNJETI (1), Y. J. Choi (2), A. Anchieta (3), M. Thines (4), R. Michelmore (5), S. T. Koike (6), C. Tsuchida (5), F. N. Martin (7), K. V. Subbarao (8), S. J. Klosterman (9); (1) University of California, Salinas, CA, U.S.A.; (2) Biodiversity and Climate Research Center (BiK-F), Frankfurt, Germany, Frankfurt Main, Germany; (3) USDA, Salinas, Salinas, CA, U.S.A.; (4) Biodiversity and Climate Research Centre (BiK-F), Frankfurt, Germany; (5) University of California, Davis, Davis, CA, U.S.A.; (6) Cooperative Extension Monterey County, Salinas, CA, U.S.A.; (7) USDA-ARS, Salinas, CA, U.S.A.; (8) UC Davis, Davis, CA, U.S.A.; (9) USDA ARS, Salinas, CA, U.S.A.

451-P Engaging the public to report occurrence of a new disease, basil downy mildew.
M. T. MCGRATH (1); (1) Cornell Univ, Riverhead, NY, U.S.A.

452-P WITHDRAWN

453-P Experimental transmission and improved detection of blackberry vein banding associated virus.
N. ABOUGHANEM-SABANADZOVIC (1), T. Thekke-Veetil (2), I. E. Tzanetakis (3), S. Sabanadzovic (4); (1) Institute for Genomics, Biocomputing and Biotechnology, Mississippi State University, Mississippi State, MS, U.S.A.; (2) Department of Plant Pathology, Division of Agriculture, University of Arkansas System, Fayetteville, AZ, U.S.A.; (3) Department of Plant Pathology, Division of Agriculture, University of Arkansas System, Fayetteville, AR, U.S.A.; (4) Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, MS, U.S.A.

454-P Survey of *Citrus tristeza virus* populations in Central California that react with MCA13 monoclonal antibody.
R. K. YOKOMI (1), S. Hajeri (2), J. Barnier (2); (1) USDA ARS PWA, Parlier, CA, U.S.A.; (2) Citrus Pest Detection Program of the Central California Tristeza Eradication Agency, Tulare, CA, U.S.A.

455-P High throughput semi-automated robotic nucleic acid extraction and purification protocol optimized for citrus tissues.
S. H. TAN (1), T. Dang (1), B. Ramirez (1), M. Voeltz (1), N. Siddiqui (1), E. Varady (1), B. Nguyen (1), G. Greer (1), S. Bodaghi (1), F. Osman (1), D. Pagliaccia (1), G. Vidalakis (1); (1) University of California, Riverside, CA, U.S.A.

456-P Non-PCR high throughput multiplex detection of citrus pathogens.
T. DANG (1), B. Ramirez (1), F. Osman (1), S. Bodaghi (1), G. Vidalakis (1); (1) University of California, Riverside, CA, U.S.A.

457-P Development of a CANARY (Cellular Analysis and Notification of Antigen Risk and Yield) assay for detection of *Citrus Leprosis Virus*.
G. Wei (1), F. Nargi (2), Z. LIU (1), J. Wang (1), M. K. Nakhla (1); (1) USDA-APHIS-PPQ-S&T-CPHST, Beltsville Lab, Beltsville, MD, U.S.A.; (2) Bioengineering Systems & Technologies, MIT Lincoln Laboratory (MIT-LL), Lexington, MA, U.S.A.

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458-P Description and detection of a novel Reovirus species in Cabernet grapevines in California.

M. AL RWAHNIH (1), S. Daubert (1), D. Golino (1), A. Durvasula (2), A. Rowhani (2); (1) University of California-Davis. Department of Plant Pathology, Davis, CA, U.S.A.; (2) University of California-Davis. Department of Plant Pathology, davis, CA, U.S.A.

459-P Development of new primers and TaqMan® probes for the detection of grapevine viruses associated with red blotch and leafroll by qPCR and digital PCR.

M. JAYANTH (1), T. L. Lawler (2), D. A. Kluepfel (3), M. R. Sudarshana (3); (1) USDA ARS, Davis, CA, U.S.A.; (2) UC Davis, Davis, CA, U.S.A.; (3) USDA-ARS, Davis, CA, U.S.A.

460-P Implementation of a DNA-macroarray diagnostic tool to assess the health status of grapevine nursery propagation material.

J. R. URBEZ TORRES (1), D. T. O'Gorman (1); (1) Pacific Agri-Food Research Centre / Agriculture and Agri-Food Canada, Summerland, BC, Canada

461-P Study of effective detection methodsof *Strawberry vein banding virus*in strawberry leave samples.

C. Ran (1), L. Chen (2), J. Lu (1), Z. Liu (1), Y. Wei (3), X. Zhao (1), Q. X. SHANG (1); (1) Beijing University of Agriculture, Beijing, China; (2) Niulanshan Second Primary School of Shunyi District, Beijing, China; (3) Beijing University of Agriculture, Beijing , China

462-P Simultaneous detection of two viruses and one viroid infecting dahlias by multiplex RT-PCR and their distribution in Japanese dahlias.

S. ASANO (1), Y. Matsushita (2), Y. Hirayama (1), T. Naka (3); (1) Nara Prefectural Agricultural Research and Development Center, Kashihara, Japan; (2) NARO Institute of Floricultural Science, Tsukuba, Japan; (3) Nara Prefectural Agricultural Research and Development Center, Nara, Japan

463-P Genomic characterisation and development of TaqMan® Real-Time RT-PCR assay for *Rose rosette virus.*

B. BABU (1), B. K. Washburn (2), K. Poduch (2), T. S. Schubert (3), C. Baker (3), J. Ayyemperumal (3), D. Jones (3), G. W. Knox (1), M. L. Paret (1); (1) North Florida Research & Education Center, University of Florida, Quincy, FL, U.S.A.; (2) Department of Biological Science, Florida State University, Tallahasse, FL, U.S.A.; (3) Florida Department of Agriculture and Consumer Service, Department of Plant Industry, Gainesville, FL, U.S.A.

464-P Combating Rose Rosette Disease: Development of rapid, efficient, easy-to-use virus diagnostic tools and studying virus-vector interactions.

R. JORDAN (1), J. Hammond (2), M. L. Paret (3), B. Babu (4), F. Ochoa-Corona (5), J. Olson (6), R. Ochoa (7), E. Roundey (8), D. Byrne (8); (1) US National Arboretum, Floral & Nursery Plants Research, USDA-ARS, Beltsville, MD, U.S.A.; (2) USDA ARS FNPRU, Beltsville, MD, U.S.A.; (3) Department of Plant Pathology, North Florida Research and Education Center, University of Florida, Quincy, FL, U.S.A.; (4) North Florida Research & Education Center, University of Florida, Quincy, FL, U.S.A.; (5) Oklahoma State University, Stillwater, OK, U.S.A.; (6) Department of Entomology & Plant Pathology, Oklahoma State University, Stillwater, OK, U.S.A.; (7) Systematic Entomology Laboratory, Beltsville Agricultural Research Center, USDA-ARS,, Beltsville, MD, U.S.A.; (8) Department of Horticultural Sciences, Texas A&M University, College Station, TX, U.S.A.

465-P Adaptation and validation of Eprobe Diagnostic Nucleic Acid analysis for screening viruses in metagenomic data using Universal virus microarray probes.

M. DUTTA (1), A. Stobbe (2), W. Schneider (3), C. M. Malmstrom (4), U. K. Melcher (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) Pennsylvania State University, University Park, PA, U.S.A.; (3) USDA-ARS, FORT DETRICK, MD, U.S.A.; (4) Michigan State University, East Lansing, MI, U.S.A.

466-P Disease detection in hop rhizomes and plantlets to ensure clean yards in Wisconsin.

M. E. MARKS (1), A. P. Geske (2), A. J. Gevens (2); (1) Univ of Wisconsin, Madison, WI, U.S.A.; (2) University of Wisconsin, Madison, WI, U.S.A.

467-P Endornaviruses in *Rhizoctonia* spp.

N. ABOUGHANEM-SABANADZOVIC (1), A. Lawrence (2), M. Tomaso-Peterson (3), S. Sabanadzovic (4); (1) Institute for Genomics, Biocomputing and Biotechnology, Mississippi State University, Mississippi State, MS, U.S.A.; (2) Institute for Imaging and Analytical Technologies, Mississippi State University, Mississippi State, MS, U.S.A.; (3) Department of Biochemnistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, MS, U.S.A.; (4) Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, MS, U.S.A.

468-P Multiple detection of four Banana viruses by reverse transcription Loop-mediated isothermal amplification.

J. ZHANG (1), W. B. Borth (2), B. Lin (3), M. J. Melzer (2), H. Shen (3), X. Pu (3), J. Hu (2); (1) Univ of Hawaii At Manoa; Key Laboratory of New Technique for Plant Protection in Guangdong, Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, Honolulu, HI, U.S.A.; (2) Univ of Hawaii At Manoa, Honolulu, HI, U.S.A.; (3) Key Laboratory of New Technique for Plant Protection in Guangdong, Institute of Plant Protection, Guangdong Academy of Agricultural Sciences, Guangzhou, China

469-P TaqMan assays designed on the coding sequence of the movementp of *Cucumber green mottle mosaic virus* for its detection in cucurbit seeds.

S. BERENDSEN (1), J. Oosterhof (1); (1) Rijk Zwaan Breeding B.V., De Lier, Netherlands

470-P Development and validation of multiplex RT-PCR protocols for viruses indexing scheme in Canadian seed potato certification program.

H. XU (1), S. Cody (2), D. L. Hammill (2); (1) Canadian Food Inspection Agency, Charlottetown Laboratory, Charlettetown, PE, Canada; (2) Canadian Food Inspection Agency, Charlottetown Laboratory, Charlottetown, PE, Canada

471-P Development of a novel PCR Macroarray for multiplex detection of main potato viruses.

C. Debonneville (1), D. Altenbach (1), C. DEBONNEVILLE (1); (1) BIOREBA AG, Reinach, Switzerland

472-P Identification of Stewart's wilt of maize (*Zea mays* L.) caused by *Pantoea stewartii subs. stewartii* in the State of Mexico, Mexico.

M. MEZZALAMA (1), B. Martinez-Cisneros (2), G. Juarez-Lopez (2), N. Valencia-Torres (2); (1) CIMMYT, texcoco, Mexico; (2) CIMMYT, Texcoco, Mexico

473-P Biofilm forming Stenotrophomonas maltophilia isolated from chlorotic streak in maize.

H. V. SILVA-ROJAS (1), P. Aguirre-Rayo (2), T. B. Uribe-Cortes (3), R. Oropeza-Navarro (4), J. M. Aguirre-Rayo (3); (1) Colegio de Postgraduados, Edo de Mexico, Mexico; (2) Instituto Tecnologico, Ciudad Altamirano, Mexico; (3) Colegio de Postgraduados, Texcoco, Mexico; (4) Universidad Nacional Autonoma de Mexico, Cuernavaca, Mexico

474-P Characterization and identification of *Pseudomonas syringae* pv. *syringae* causing bacterial shoot blight on apple.

S. LEE (1), W. Cheon (1), Y. Jeon (1); (1) Andong National University, Andong, South Korea

475-P Association of *Diaporthe longicolla* with zone lines on soybean stems and roots.

F. M. MATHEW (1), A. Gebreil (1), K. A. Wise (2), C. A. Bradley (3), D. S. Mueller (4), M. I. Chilvers (5); (1) South Dakota State University, Brookings, SD, U.S.A.; (2) Purdue University, West Lafayette, IN, U.S.A.; (3) University of Illinois, Urbana, IL, U.S.A.; (4) Iowa State University, Ames, IA, U.S.A.; (5) Michigan State University, East Lansing, MI, U.S.A.

476-P What is flag smut of wheat?

K. G. SAVCHENKO (1), L. M. Carris (1), J. Demers (2), L. A. Castlebury (3); (1) Department of Plant Pathology, Washington State University, Pullman, WA, U.S.A.; (2) Systematic Mycology & Microbiology Laboratory, USDA-ARS, Beltsville, MD, U.S.A.; (3) Systematic Mycology and Microbiology Laboratory, USDA-ARS, Beltsville, MD, U.S.A.

477-P Identification and pathogenicity of Fusarium sp. associated with yellowing and wilting of blackberry (Rubus sp.) in Michoacan, Mexico.

A. Hernandez- Cruz (1), A. REBOLLAR-ALVITER (2), H. V. Silva-Rojas (3), T. B. Urbina-Cortes (4); (1) Instituto Tecnológico del Valle de Morelia, Morelia, Mich, Mexico; (2) Univ Autonoma Chapingo, Morelia, Mich, Mexico; (3) Lab. de Biotecnología de Semillas, Colegio de Posgraduados, Montecillo, Texcoco, Mexico, Mexico; (4) Lab. de Biotecnología de Semillas. Colegio de Posgraduados, Montecillo, Mexico, Mexico

478-P *Eutypella* spp. and *Neoscytalidium hyalinum* causing citrus branch canker and dieback in the Southern California desert regions.
J. S. MAYORQUIN (1), D. H. Wang (1), M. Twizeyimana (1), A. Eskalen (1); (1) University of California, Riverside, CA, U.S.A.

479-P Grapevine trunk diseases in British Columbia.
J. R. URBEZ TORRES (1), P. Haag (1), J. Boule (1), D. O'Gorman (1); (1) Pacific Agri-Food Research Centre / Agriculture and Agri-Food Canada, Summerland, BC, Canada

480-P A reassessment of grapevine (*Vitis vinifera*) trunk diseases in Washington state vineyards.
L. A. HOLLAND (1), G. G. Grove (2), D. A. Glawe (1); (1) Washington State University, Pullman, WA, U.S.A.; (2) Washington State University, Irrigated Agriculture Research and Extension Center, Prosser, WA, U.S.A.

481-P Identification and biological characteristics of the pathogenic sf-19 strain of grape sour rot from Beijing.
Y. WEI (1), C. Wang (1), X. Zhao (1), Q. Shang (1), Z. Liu (1); (1) Beijing University of Agriculture, Beijing, China

482-P Observation and identification of wood-decay fungi from the heartwood of peach tree limbs in central Georgia, USA.
C. Chen (1), C. H. BOCK (1), M. W. Hotchkiss (1), M. M. Garbelotto (2), T. E. Cottrell (1); (1) USDA-ARS-SEFTNRL, 21 Dunbar Rd., Byron, GA, U.S.A.; (2) University of California, Department of Environmental Science, 130 Mulford Hall, Berkeley, CA, U.S.A.

483-P Current status of kiwifruit arm dieback in Chile.
G. A. DIAZ (1), M. Lolas (1), B. A. Latorre (2), J. P. Zoffoli (2); (1) Universidad de Talca, Talca, Chile; (2) Pontificia Universidad Catolica de Chile, Santiago, Chile

484-P First report of *Monilochaetes infuscans infecting Punica granatum.*
B. LIU (1), R. Cadet (1), F. Zhang (2); (1) USDA APHIS PPQ, Linden, NJ, U.S.A.; (2) USDA APHIS PPQ, San Mateo, CA, U.S.A.

485-P First report of the teleomorph of *Neofusicoccum mediterraneum*, a pathogen of olive.
J. Moral (1), M. Pérez Rodríguez (2), T. MICHAILIDES (3), A. TRAPERO-CASAS (2); (1) Univ De Cordoba, Cordoba, Spain; (2) UNIVERSITY OF CORDOBA, CORDOBA, Spain; (3) University of California-Davis Kearney Agricultural Research and Extension Center, PARLIER, CA, U.S.A.

486-P Identification of possible new species of *Botrytis* in strawberries grown in California.
P. R. Ferrer (1), A. Frye (1), C. Fiedor (1), J. Titius (1), J. Hayes (1), S. Piele (1), J. C. Broome (2), M. Kong (2), W. D. GUBLER (3), M. RoyChowdhury (1); (1) Fresno Pacific University, Fresno, CA, U.S.A.; (2) Driscoll Strawberry Associates Inc, Watsonville, CA, U.S.A.; (3) University of California, Davis, Davis, CA, U.S.A.

487-P Morphological and molecular identification of *Verticillium* species causing vascular wilt of peppermint in Nevada.
R. A. BOMBERGER (1), S. Wang (1); (1) Nevada Department of Agriculture, Sparks, NV, U.S.A.

488-P Molecular identification of intercepted *Colletotrichum* fungi at an APHIS-PPQ plant inspection station.
A. H. KENNEDY (1), K. A. Beucke (2), S. L. Gallant (2), F. Zhang (2); (1) USDA-APHIS-PPQ-National Identification Services, Beltsville, MD, U.S.A.; (2) USDA-APHIS-PPQ-San Francisco Plant Inspection Station, South San Francisco, CA, U.S.A.

489-P Disease diagnosis, habitat decline and fungal diversity associated with endangered Gondwanan conifers in New Caledonia.
J. SMITH (1), A. Black (2), F. Tron (3), N. Anger (4), T. Dreaden (2); (1) Univ of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.; (3) Conservation International, Noumea, New Caledonia; (4) Institut Agronomique Neo-Caledonien, Noumea, New Caledonia

490-P Diplodia shoot blight on ponderosa pine following hail in northeast Oregon.
B. W. OBLINGER (1); (1) USDA Forest Service, Bend, OR, U.S.A.

491-P *Erysiphe australiana* causing powdery mildew on *Lagerstroemia speciosa* in Brazil.
N. R. FONSECA (1), L. M. Guimaraes (1), R. P. Pires (1), A. C. Alfenas (1); (1) Universidade Federal de Vicosa, Vicosa, Brazil

492-P Characterization of *Ophiosphaerella species* causing spring dead spot disease of bermudagrass in South Carolina and Buenos Aires, Argentina.
A. CANEGALLO (1), S. B. Martin (1), W. J. Park (1), P. Agudelo (2), L. McCarty (2), J. Kerrigan (2), L. Tredway (3), R. Cantoro (4); (1) Pee Dee Research & Education Ctr, Florence, SC, U.S.A.; (2) Clemson University, Clemson, SC, U.S.A.; (3) Syngenta Lawn and Garden, Zebulon, NC, U.S.A.; (4) Universidad Catolica Argentina, Buenos Aires, Argentina

493-P Identification and characterization of fungi causing leaf spot and crown rot of bermudagrass in Florida.
P. STAVORNVISIT (1), P. F. Harmon (2), . A. Rollins (1); (1) University of Florida, Gainesville, FL, U.S.A.; (2) Univ of Florida, Gainesville, FL, U.S.A.

494-P Novel reports of *Penicillium* spp. causing blue mold on onion and garlic in the Pacific Northwest U.S.A.
F. M. DUGAN (1), S. L. Lupien (2), C. Vahling-Armstrong (3), G. A. Chastagner (4), B. K. Schroeder (5); (1) USDA ARS, Pullman, WA, U.S.A.; (2) USDA-ARS, Pullman, WA, U.S.A.; (3) USDA-ARS, Fort Pierce, FL, U.S.A.; (4) Washington State University, Puyallup, WA, U.S.A.; (5) University of Idaho, Moscow, ID, U.S.A.

495-P Root rot-like symptoms caused by grain-based inoculum substrates.
G. ARALDI DA SILVA (1), L. F. S. Leandro (1), D. S. Mueller (1); (1) Iowa State University, Ames, IA, U.S.A.

496-P Microbiome study of potato taste defect in coffee beans from Rwanda.
J. i. YANG (1), P. Ruegger (2), T. Miller (2), P. Philippe Rolshausen (2), J. Borneman (2); (1) National Taiwan University, Taipei, Taiwan; (2) University of California, Riverside, Riverside, CA, U.S.A.

497-P First detection of *Lucerne transient streak virus* infecting alfalfa in the Kingdom of Saudi Arabia (KSA).
I. M. ALSHAHWAN (1), O. A. Abdalla (1), A. Raza (1), M. A. Al-Saleh (1), M. A. Amer (1); (1) King Saud University, Riyadh, Saudi Arabia

498-P Invasion of the dicot-infecting mastrevirus *Chickpea chlorotic dwarf virus* in solanaceous hosts in Pakistan.
M. Zia-Ur-Rehman (1), U. Hameed (1), H. W. Herrmann (2), M. J. Iqbal (1), M. S. Haider (1), J. K. BROWN (2); (1) Institute of Agricultural Sciences, University of Punjab, Punjab, Pakistan; (2) University of Arizona/School of Plant Sciences, Tucson, AZ, U.S.A.

499-P Detection and characterization of *Shamrock chlorotic ringspot virus* and *Beet ringspot virus* in ornamental *Oxalis*.
R. JORDAN (1), D. Mollov (2), M. A. Guaragna (1), A. Phibbs (3), B. E. Lockhart (4); (1) US National Arboretum, Floral & Nursery Plants Research, USDA-ARS, Beltsville, MD, U.S.A.; (2) USDA ARS NGRL, Beltsville, MD, U.S.A.; (3) Plant Industry Laboratory, Wisconsin Department of Agriculture, Trade and Consumer Protection, Madison, WI, U.S.A.; (4) University of Minnesota, Minneapolis, MN, U.S.A.

500-P First report of *Pepper vein yellows virus* infecting pepper (*Capsicum* spp.) in the United States.
O. J. ALABI (1), M. Al Rwahnih (2), J. L. Jifon (3), L. Gregg (4), K. M. Crosby (5), E. T. Mirkov (1); (1) Department of Plant Pathology & Microbiology, Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.; (2) University of California-Davis, Davis, CA, U.S.A.; (3) Department of Horticultural Sciences, Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.; (4) Texas A&M AgriLife Research and Extension Center, Weslaco, TX, U.S.A.; (5) Department of Horticultural Sciences, Texas A&M University, College Station, TX, U.S.A.

501-P Evidence that *Tomato mottle leaf curl virus* from Northeastern Brazil is an indigenous New World monopartite begomovirus.
S. VU (1), T. Melgarejo (2), L. f. Chen (1), J. de Souza (1), M. Macedo (1), A. Nagata (3), R. L. Gilbertson (1); (1) University of California, Davis - Department of Plant Pathology, Davis , CA, U.S.A.; (2) Departamento de Fitopatologia, Universidad Nacional Agraria La Molina, Lima, Peru; (3) Embraba Vegetables, Brasilia, DF, Brazil

(continued)

502-P Greenhouse hemp in Kentucky exhibits many common diseases.

N. WARD-GAUTHIER (1), J. Beale (2), B. Amsden (2), E. Dixon (2); (1) Univ of Kentucky, Lexington, KY, U.S.A.; (2) University of Kentucky, Lexington, KY, U.S.A.

503-P *Alternaria* species on carrot in Serbia.

A. R. BULAJIC (1), I. M. Stankovic (1), A. B. Vucurovic (1), K. N. Milojevic (1), D. M. Nikolic (1), S. D. Teodorovic (2), B. B. Krstic (1); (1) Institute of Phytomedicine, Department of Phytopathology, University of Belgrade-Faculty of Agriculture, Belgrade, Zemun, Serbia; (2) Forensics Department, Academy for Criminalistic and Police Studies, Belgrade, Serbia

504-P Plant-parasitic nematodes on field crops in Southeastern and Northeastern North Dakota.

G. P. YAN (1), A. Plaisance (1), W. Ye (2); (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (2) North Carolina Department of Agriculture & Consumer Service, Agronomic Division, Nematode Assay Section, Raleigh, NC, U.S.A.

505-P Frequency and Heterogeneity of Plant-Parasitic Nematodes in Corn Fields in Ohio.

A. C. Simon (1), T. L. Niblack (1), P. A. PAUL (1); (1) The Ohio State University, Columbus, OH, U.S.A.

506-P Distribution and abundance of *Heterodera glycines* and *Macrophomina phaseolina* in Ohio.

H. D. LOPEZ-NICORA (1), A. C. M. Simon (1), B. C. Dossman (1), P. A. Paul (2), A. E. Dorrance (2), L. E. Lindsey (1), T. L. Niblack (1); (1) The Ohio State University, Columbus, OH, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.

507-P Plant-parasitic nematodes on field pea in North Dakota.

G. P. YAN (1), J. S. Pasche (1), K. Zitnick-Anderson (1), S. Pederson (2); (1) North Dakota State University, Department of Plant Pathology, Fargo, ND, U.S.A.; (2) North Dakota State University, North Central Research Extension Center, Minot, ND, U.S.A.

508-P Molecular characterisation of reniform nematodes of the genus *Rotylenchulus* Linford & Oliveira, 1940 (Rotylenchulidae, Tylenchida).

S. A. SUBBOTIN (1), E. Van den Berg (2), J. E. Palomares-Rius (3), . Vovlas (4), L. R. Tiedt (5), P. Castillo (3); (1) Plant Pest Diagnostic Center, California Department of Food and Agriculture, Sacramento, CA, U.S.A.; (2) Biosystematics Programme, ARC-Plant Protection Research Institute, Queenswood, South Africa; (3) Institute for Sustainable Agriculture (IAS), Spanish National Research Council, Córdoba, Spain; (4) Istituto per la Protezione Sostenibile delle Piante, Bari, , Italy; (5) North West University, Potchefstroom, South Africa

509-P Diversity of *Phytophthora* species detected from retail nursery plants in Nevada.

R. A. Bomberger (1), S. WANG (1); (1) Nevada Department of Agriculture, Sparks, NV, U.S.A.

510-P Expanding *Phytophthora ramorum* Sample Processing in New York: Searching for *P. kernoviae*, Identifying Species, and Evaluating Preliminary Test Methods.

K. SNOVER-CLIFT (1), M. Daughtrey (2), T. Allen (1), S. Jensen (1); (1) Cornell University, Ithaca, NY, U.S.A.; (2) Cornell University, Riverhead, NY, U.S.A.

511-P Survey for Incidence and Distribution of Grapevine Viruses in British Columbia.

S. Poojari (1), J. Boule (1), N. DeLury (1), T. Lowery (1), M. Rott (2), A. M. Schmidt (2), J. R. URBEZ-TORRES (1); (1) Agriculture and Afri-Food Canada / Pacific Agri-Food Research Centre, Summerland, BC, Canada; (2) Canadian Food Inspection Agency (CFIA), North Saanich, BC, Canada

512-P Soybean vein necrosis virus and other viruses in of soybeans in Mississippi.

N. Aboughanem-Sabanadzovic (1), W. F. Moore (2), T. W. Allen (3), R. C. Stephenson (4), S. SABANADZOVIC (2); (1) Institute for Genomics, Biocomputing and Biotechnology, Mississippi State University, Mississippi State , MS, U.S.A.; (2) Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, MS, U.S.A.; (3) Delta Research and Extensions Center, Mississippi State University, Stoneville, MS, U.S.A.; (4) Coastal Research and Extension Center, Mississippi State University, Biloxi, MS, U.S.A.

513-P Viruses present in ornamental *Allium* in the United States.

D. Bampi (1), M. D. Reinsel (2), J. HAMMOND (2); (1) Universidade Estadual Paulista Julia de Mesquita Filho, Botucatu, Brazil; (2) USDA ARS FNPRU, Beltsville, MD, U.S.A.

514-P *Iris yellow spot virus* epidemics in onion crops in Serbia.

B. B. KRSTIC (1), I. M. Stankovic (1), A. B. Vucurovic (1), K. N. Milojevic (1), D. M. Nikolic (1), S. D. Teodorovic (2), A. R. Bulajic (1); (1) Institute of Phytomedicine, Department of Phytopathology, University of Belgrade-Faculty of Agriculture, Belgrade, Zemun, Serbia; (2) Forensics Department, Academy for Criminalistic and Police Studies, Belgrade, Serbia

515-P Zucchini yellow mosaic virus infection in pumpkin (*Cucurbita pepo*) and squash (*Cucurbita maxima*) in Trinidad.

C. CHINNADURAI (1), A. Ramkissoon (1), R. Rajendran (2), A. Ramsubhag (1), J. Jayaraman (1); (1) The University of the West Indies, St Augustine, Trinidad and Tobago; (2) Tamil Nadu Agricultural Universtiy, Coimbatore, India

516-P Small RNA deep sequencing revealed that mixed infection of known and unknown viruses were common in field collected vegetable samples.

C. Padmanabhan (1), Y. Zheng (2), R. Li (3), Z. Fei (4), K. s. LING (5); (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) USDA-ARS, U.S, Vegetable Laboratory, Charleston, SC, U.S.A.; (4) Boyce Thompson Insitute for Plant Research, Ithaca, NY, U.S.A.; (5) USDA ARS, Charleston, SC, U.S.A.

517-P A Comprehensive Field Survey of the Sweetpotato Potyvirus Complex in North Carolina.

C. V. ALMEYDA (1), C. L. Ulibarri (1), T. Abernethy (1), J. A. Abad (2), Z. Pesic-VanEsbroeck (1); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) USDA-APHIS PPQ FO PGQP, Beltsville, MD, U.S.A.

New and Emerging Diseases

518-P An Invasive Lethal Phytoplasma Disease Threatening Stone Fruit Production: Detection, Epidemiology and Management.

Y. ABOU JAWDAH (1), M. Jawhari (1), H. Sobh (1), P. Tawidian (1), E. Choueiri (2), M. Molino-Lova (3), F. Quaglino (4), P. A. Bianco (4); (1) American Univ of Beirut, Beirut, Lebanon; (2) LARI, Beirut, Lebanon; (3) AVSI, Beirut, Lebanon; (4) University Di Milano, Milano, Italy

519-P Cassava Bacterial blight: a main biological constraint for cassava production in West-Africa.

I. Wonni (1), D. Kone (2), O. Koita (3), K. Dagno (4), V. VERDIER (5); (1) INERA Farako-Ba and LMI Pathobios, Bobo-Dioulasso, Burkina-faso, Bobo-Dioulasso, Burkina faso; (2) Université Félix Houphouët-Boigny, UFR Biosciences, Laboratoire de Physiologie Végétale,, Abidjan, Ivory Coast; (3) Laboratoire de Biologie Moléculaire Appliquée, Université des Sciences Techniques et Technologiques de Bamako, Bamako, Mali; (4) Institut d'Economie Rurale, Programme Sorgho-CRRA de Sotuba, Bamako, Mali; (5) IRD, UMR Interactions Plantes Microorganismes Environnement, IRD-Cirad-Université de Montpellier, Montpellier, France

520-P Genotype specific effects of *Fusarium* co-infection on sorghum stalk rot symptom development.

A. Y. BANDARA (1), T. T. Tesso (2), C. R. Little (2); (1) Kansas State Univ, Manhattan, KS, U.S.A.; (2) Kansas State University, Manhattan, KS, U.S.A.

521-P Use of isolate mixtures for screening sorghum germplasm against stalk rot diseases.

A. Y. BANDARA (1), T. T. Tesso (2), C. R. Little (2); (1) Kansas State Univ, Manhattan, KS, U.S.A.; (2) Kansas State University, Manhattan, KS, U.S.A.

522-P Preliminary assessment of differential susceptibility of soft red winter wheat cultivars to Lolium and Triticum pathotypes of *Magnaporthe oryzae*.

K. MILLS (1), P. Paul (2), L. Madden (2), G. Peterson (3); (1) Ohio State Univ, Orrville, OH, U.S.A.; (2) The Ohio State University, Wooster, OH, U.S.A.; (3) USDA ARS Foreign Disease-Weed Science Research Unit, Fort Detrick, MD, U.S.A.

523-P Newly observed diseases of blueberries in the Pacific Northwest.
M. L. PUTNAM (1), M. Serdani (2), M. S. Wiseman (2); (1) Oregon State Univ, Corvallis, OR, U.S.A.; (2) Oregon State University - Plant Clinic, Corvallis, OR, U.S.A.

524-P *Botryosphaeriaceae* associated with macadamia branch die-back is becoming a significant pathogen in Australia.
F. AKINSANMI (1), C. Searle (2), A. Drenth (1); (1) The University of Queensland, QAAFI, Centre of Plant Science, Brisbane, Australia; (2) Suncoast Gold Macadamias, Drummond Drive,, Gympie, Australia

525-P *Pestalotiopsis* spp., a newly discovered root pathogen of strawberry transplants.
J. MERTELY (1), M. Chamorro (2), N. A. Peres (2); (1) Univ of Florida-GCREC, Wimauma, FL, U.S.A.; (2) University of Florida-GCREC, Wimauma, FL, U.S.A.

526-P The population structure of *Fusarium oxysporum* f sp. *fragariae,* cause of Fusarium wilt of strawberry, in California.
P. HENRY (1), T. R. Gordon (2), S. Kirkpatrick (2); (1) Univ of California, Davis, CA, U.S.A.; (2) University of California, Davis, Davis, CA, U.S.A.

527-P Nonpathogenic *Geosmithia* species associated with the walnut twig beetle, *Pityophthorus juglandis*, in California walnut orchard.
T. V. ROUBTSOVA (1), T. L. Nguyen (1), M. A. Yaghmour (1), S. J. Seybold (1), R. M. Bostock (1); (1) UC Davis, Davis, CA, U.S.A.

528-P Characterization of foliar diseases on processed lima bean in New York State.
A. M. GORNY (1), J. R. Kikkert (2), A. R. Dunn (1), H. R. Dillard (3), C. D. Smart (1), S. J. Pethybridge (1); (1) Cornell University - NYSAES, Geneva, NY, U.S.A.; (2) Cornell Cooperative Extension, Canandaigua, NY, U.S.A.; (3) University of California, Davis, Davis, CA, U.S.A.

529-P Fungal diseases of *Cannabis sativa* in British Columbia, Canada.
G. RODRIGUEZ (1), A. Kibler (1), P. Campbell (1), Z. K. Punja (2); (1) Agrima Botanicals, Maple Ridge, BC, Canada; (2) Simon Fraser Univ, Burnaby, BC, Canada

530-P *Rubus armeniacus sensu stricto* is not susceptible to *Phragmidium violaceum* in Oregon.
W. L. BRUCKART (1), J. L. Michael (1); (1) USDA ARS FDWSRU, Fort Detrick, MD, U.S.A.

531-P A *Colletotrichum* sp. causing root rot in sugar beet (*Beta vulgaris.*)
L. E. HANSON (1), O. T. Neher (2); (1) USDA ARS, East Lansing, MI, U.S.A.; (2) The Amalgamated Sugar Company, LLC, Boise, ID, Canada

532-P Phylogenetic and morphological identification of the novel pathogen of *Rheum palmatum* leaf spot in Northwest China.
Y. WANG (1), A. O. Charkowski (2), C. X. Rong (3), c. y. Zeng (1), C. H. Gang (1); (1) Gansu University of Traditional Chinese Medicine, Lanzhou, China; (2) University of Wisconsin-Madison, Madison, WI, U.S.A.; (3) Gansu Agricultural University, Lanzhou, China

533-P *Pseudoperonospora saposhnikovia* nov. sp on *Saposhnikovia divaricate.*
Y. WANG (1), A. O. Charkowski (2), L. Jin (1), Y. Y. Zhang (3), T. Zhu (1); (1) Gansu University of Traditional Chinese Medicine, Lanzhou, China; (2) University of Wisconsin-Madison, Madison, WI, U.S.A.; (3) Longxi Agricultural Science and Technology Center, Lanzhou, China

534-P Understanding the emergent fruit rot disease of Winterberry holly.
F. Peduto Hand (1), S. LIN (1), N. J. Taylor (2), R. H. Zondag (3); (1) The Ohio State University, Columbus, OH, U.S.A.; (2) C. Wayne Ellett Plant & Pest Diagnostic Clinic, Raynoldsburg, OH, U.S.A.; (3) The Ohio State University Extension, Painesville, OH, U.S.A.

535-P Understanding and managing a Diplodia blight outbreak on slash pine in Florida.
C. A. PAEZ (1), J. A. Smith (2); (1) University of Florida, Alachua, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.

536-P Laurel wilt in Louisiana: The disease continues to spread on sassafras (*Sassafras albidum*).
S. W. FRAEDRICH (1), W. Johnson (2), R. D. Menard (2), G. S. Best (1), T. C. Harrington (3); (1) USDA Forest Service, Athens, GA, U.S.A.; (2) USDA Forest Service, Pineville, LA, U.S.A.; (3) Department of Plant Pathology and Microbiology, Ames, IA, U.S.A.

537-P Systemic movement of *Raffaelea lauricola* through the rhizomes of pondberry.
G. S. Best (1), S. W. FRAEDRICH (1); (1) USDA Forest Service, Athens, GA, U.S.A.

538-P Evaluation of laurel wilt tolerance in redbay (*Persea borbonia*).
M. A. HUGHES (1), J. A. Smith (1); (1) University of Florida, Gainesville, FL, U.S.A.

539-P Assessing the pathogenicity of *Raffaelea* spp. isolated from *Xyleborus glabratus* to swamp bay, *Persea palustris.*
T. J. DREADEN (1), A. Campbell (1), R. C. Ploetz (2), J. A. Smith (1); (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida-Tropical Research Education Center, Homestead, FL, U.S.A.

540-P WITHDRAWN

541-P Pathogenicity of *Cylindrosporium concentricum* on cultivated and weedy *Brassica* hosts.
B. J. CLAASSEN (1), M. Serdani (2), C. Mallory-Smith (1), W. J. Thomas (1), M. L. Putnam (2), C. M. Ocamb (1); (1) Oregon State University, Corvallis, OR, U.S.A.; (2) Oregon State University - Plant Clinic, Corvallis, OR, U.S.A.

542-P New and re-emerging fungal pathogens affecting Brassicaceae plants in western Oregon: black leg, light leaf spot, and white leaf spot.
C. M. OCAMB (1), C. Mallory-Smith (1), W. J. Thomas (1), M. Serdani (2), M. L. Putnam (2); (1) Oregon State University, Corvallis, OR, U.S.A.; (2) Oregon State University - Plant Clinic, Corvallis, OR, U.S.A.

543-P Diversity of *Stagonosporopsis* species causing gummy stem blight of gherkin in Karnataka region, India.
R. H. GARAMPALLI (1), M. K. G. (2), H. X. Li (3), M. T. Brewer (3); (1) University of Mysore, Mysore, Karnataka, India, Mysore, India; (2) University of Mysore, Mysore, India; (3) University of Georgia, Department of Plant Pathology, Athens, GA, U.S.A.

544-P Dry Rot Canker Disease of Sugar Beet in Nebraska.
R. M. HARVESON (1), M. D. Bolton (2); (1) Univ of Nebraska, Scottsbluff, NE, U.S.A.; (2) USDA-ARS, Fargo, ND, U.S.A.

545-P A new lethal canker disease affecting Paradox walnut rootstock in California.
H. GOURAN (1), R. Bhat (2), R. Beede (3), E. Fichtner (4), J. Hasey (5), R. Buchner (6), G. Browne (1); (1) USDA-ARS, davis, CA, U.S.A.; (2) None, Davis , CA, U.S.A.; (3) Division of Agriculture and Natural Resources, Hanford, CA, U.S.A.; (4) UC cooperative extension, Tulare, CA, U.S.A.; (5) Division of Agriculture and Natural Resources, Yuba City, CA, U.S.A.; (6) UC cooperative extension, Red Bluff, CA, U.S.A.

546-P Emergence of the impatiens downy mildew epidemics in the U.S. corresponded with a shift in pathogen population structure.
C. SALGADO-SALAZAR (1), Y. Rivera (1), J. A. Crouch (2); (1) USDA-ARS, Rutgers University, Beltsville, MD, U.S.A.; (2) USDA-ARS, Beltsville, MD, U.S.A.

547-P Comparative genome analysis of three oomycete species causing downy mildew disease in specialty crop production.
Y. RIVERA (1), C. Salgado-Salazar (2), D. Veltri (3), J. A. Crouch (4); (1) USDA-ARS; Rutgers University, Beltsville, MD, U.S.A.; (2) USDA-ARS, Rutgers University, Beltsville, MD, U.S.A.; (3) Rutgers University, New Brunswick, NJ, U.S.A.; (4) USDA-ARS, Beltsville, MD, U.S.A.

548-P *Phytophthora intercalaris*, a novel species from streams and irrigation water in eastern United States.
X. YANG (1), N. Brazee (2), A. Loyd (3), C. Hong (4); (1) Virginia Tech, Virginia Beach, VA, U.S.A.; (2) University of Massachusetts, Amherst, MA, U.S.A.; (3) Bartlett Tree Diagnostic Laboratories, Stamford, CT, U.S.A.; (4) Virginia Polytechnic Institute and State University, Virginia Beach, VA, U.S.A.

(continued)

549-P Seasonal occurrence of thrips species prevalent in soybean and the economic impact of *Soybean vein necrosis virus* in Wisconsin.
C. BLOOMINGDALE (1), R. L. Groves (1), D. Smith (1); (1) Univ of Wisconsin, Madison, WI, U.S.A.

550-P RNAi Mediated Silencing of *Triticum mosaic virus* coat protein gene induces resistance to virus in transgenic wheat.
J. L. RUPP (1), L. Cruz (1), J. P. Fellers (2), H. N. Trick (1); (1) Kansas State University, Manhattan, KS, U.S.A.; (2) USDA-ARS, Manhattan, KS, U.S.A.

551-P Latent virus survey in pome and stone fruit nurseries 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.

552-P Phylogeny of *Tobacco streak virus* in cranberry.
J. POLASHOCK (1), L. Wells (2), P. McManus (2), E. Saalau Rojas (3); (1) USDA ARS, Chatsworth, NJ, U.S.A.; (2) University of Wisconsin-Madison, Madison, WI, U.S.A.; (3) University of Massachusetts Amherst, Amherst, MA, U.S.A.

553-P Characterization of three new amalgaviruses from different hosts.
N. Aboughanem-Sabanadzovic (1), S. SABANADZOVIC (2); (1) Institute for Genomics, Biocomputing and Biotechnology, Mississippi State University, Mississippi State, MS, U.S.A.; (2) Department of Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State University, MS, U.S.A.

554-P Degradome sequencing reveals history and diversity of *Citrus leprosis viruses* in preserved specimens.
J. S. HARTUNG (1), A. Roy (2), S. Fu (3), J. Shao (1), W. L. Schneider (2), R. H. Brlansky (4); (1) USDA ARS MPPL, Beltsville, MD, U.S.A.; (2) USDA-ARS, Frederick, MD, U.S.A.; (3) USDA ARS, Beltsville, MD, U.S.A.; (4) Univ of Florida, Lake Alfred, FL, U.S.A.

555-P The occurrence of *Tobacco ringspot virus* in a wine grape (*Vitis vinifera* L.) cultivar in Washington State.
L. Walker (1), B. BAGEWADI (1), A. Schultz (2), R. A. Naidu (3); (1) Department of Plant pathology, Washington State University, Prosser, Prosser, WA, U.S.A.; (2) Harttrup Frams Inc., Wapato, WA, Wapato, WA, U.S.A.; (3) Department of Plant Pathology, Washington State University, Prosser, Prosser, WA, U.S.A.

556-P Characterization of the Promoter of Grapevine vein clearing virus.
Y. ZHANG (1), C. A. Angel (2), S. Valdes (3), W. Qiu (4), J. Schoelz (1); (1) University of Missouri-Columbia, Columbia, MO, U.S.A.; (2) Colombian Sugarcane Research Center, Cali, Colombia; (3) International Center for Tropical Agriculture, Cali, Colombia; (4) Missouri State University, Mountain Grove, MO, U.S.A.

557-P First report of an ipomovirus in California: identification of a divergent strain of *Squash vein yellowing virus* in the Imperial Valley of California.
O. BATUMAN (1), E. . Natwick (2), W. M. Wintermantel (3), T. Tian (4), J. . McCreight (3), L. L. Hladky (3), R. L. Gilbertson (1); (1) University of California, Davis, CA, U.S.A.; (2) University of California ANR Cooperative Extension Imperial County, Holtville, CA, U.S.A.; (3) United States Department of Agriculture-Agricultural Research Service, Salinas, CA, U.S.A.; (4) California Dept of Food & Agric, Sacramento, CA, U.S.A.

558-P Comparative analysis of *Cucumber green mottle mosaic virus* in California: evidence to two introductions.
T. PITMAN (1), T. Tian (2), B. Aegerter (3), B. Falk (1); (1) Univ of California, Davis, CA, U.S.A.; (2) California Dept of Food & Agric, Sacramento, CA, U.S.A.; (3) Univ of California Coop Ext, Stockton, CA, U.S.A.

559-P Discovery of five virus species in currant.
T. HO (1), J. D. Postman (2), I. E. Tzanetakis (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.

560-P Monitoring virus and phytoplasma incidences in Texas peach orchards: 2014 and 2015.
K. ONG (1), S. C. Rhodes (2), M. Giesbrecht (2); (1) Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.; (2) Texas A&M AgriLife Extension Service, College Station, TX, U.S.A.

561-P Discovery and evolutionary studies on five carlaviruses infecting elderberry.
T. HO (1), K. E. Keller (2), R. R. Martin (2), J. D. Postman (2), I. E. Tzanetakis (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) USDA ARS, Corvallis, OR, U.S.A.

562-P Detection, discrimination and discovery of a new *Tobacco streak virus* strain.
M. DUTTA (1), A. Ali (2), U. K. Melcher (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) Univ of Tulsa, Tulsa, OK, U.S.A.

563-P Detection of *Helenium virus S* and two distinct isolates of *Butterbur mosaic virus* in a single plant of Veronica.
J. HAMMOND (1), M. D. Reinsel (1), B. E. Lockhart (2), D. Mollov (3); (1) USDA ARS FNPRU, Beltsville, MD, U.S.A.; (2) University of Minnesota, Minneapolis, MN, U.S.A.; (3) USDA ARS NGRL, Beltsville, MD, U.S.A.

564-P Star jasmine (*Jasminum multiflorum*) plants in Hawaii are infected with multiple tombusviruses.
M. Leite de Oliviera (1), W. Borth (2), J. Carrillo (3), J. Hu (2), K. Neupane (3), S. Stubblefield (3), M. MELZER (2); (1) Universidade Estadual Paulista, Botucatu, Brazil; (2) Univ of Hawaii At Manoa, Honolulu, HI, U.S.A.; (3) Leeward Community College, Pearl City, HI, U.S.A.

565-P A previously undescribed badnavirus genome sequence determined by Illumina sequencing from cacao trees showing virus-like symptoms in Trinidad.
J. K. BROWN (1), M. Zia-Ur-Rehman (2), N. Chingandu (3), T. N. Sreenivasan (4), S. Surujdeo-Maharaj (4), O. Gutierrez (5), H. W. Herrmann (1), P. Umaharan (4); (1) University of Arizona/School of Plant Sciences, Tucson, AZ, U.S.A.; (2) University of Lahore, Punjab, Pakistan; (3) University of Arizona/School of Plant Sciences, TUCSON, AZ, U.S.A.; (4) Cocoa Research Center/The University of the West Indies, St. Augustine, Trinidad and Tobago; (5) USDA-ARS Subtropical Horticultural Research Station, Miami, FL, U.S.A.

566-P WITHDRAWN

567-P Metagenomic analysis of the sugarcane virome in Florida reveals prevalent and potential novel viruses.
E. Fernandez (1), D. Filloux (1), J. C. Comstock (2), P. Roumagnac (1), P. ROTT (3); (1) Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Montpellier, France; (2) United States Department of Agriculture, Agricultural Research Service, Canal Point, FL, U.S.A.; (3) University of Florida, Belle Glade, FL, U.S.A.

568-P Unusually large alphasatellite associated with *Cotton leaf curl Gezira virus* infecting okra in Jazan, Saudi Arabia.
M. A. AL-SALEH (1), A. M. Zakri (2), J. K. Brown (3), A. M. Idris (4); (1) Department of Plant Protection, College of Food and Agricultural Sciences, King Saudi University, Riyadh, Saudi Arabia; (2) Department of Plant Production, College of Food and Agricultural Sciences, King Saudi University, Riyadh, Saudi Arabia; (3) The University of Arizona, Tucson, AZ, U.S.A.; (4) King Abdullah Univ of Science and Technology, Thuwal, Saudi Arabia

569-P Molecular identification of eggplant-infecting begomoviruses in Southeast Asia.
W. S. TSAI (1), L. Kenyon (2); (1) National Chiayi University, Chiayi, Taiwan; (2) AVRDC – The World Vegetable Center, Shanhua, Tainan, Taiwan

570-P Genome sequencing, genetic diversity and field detection of Cucumber green mottle mosaic virus using LAMP technology.
K. s. LING (1), R. Li (1); (1) USDA-ARS, U.S. Vegetable Laboratory, Charleston, SC, U.S.A.

571-P Full-length genome sequence of a pepper infecting *Beet western yellows virus (BWYV) isolate in Turkey.*
N. BUZKAN (1), B. B. ARPACI (2), A. G. TEKIK (1), B. MOURY (3); (1) Kahramanmaras Sutcu Imam University Agriculture Faculty Plant Protection Department, Kahramanmaras, Turkey; (2) Kilis Yedi Aralik University Agriculture Faculty Horticulture Department, Kilis, Turkey; (3) INRA, UR407 Pathologie Végétale, Montfavet, France

572-P Genetic analysis of begomoviruses and betasatellites associated with tomato leaf curl disease in Ghana.
Y. J. MATER (1), L. f. Chen (2), M. K. Osei (3), R. L. Gilbertson (4); (1) University of California, Davis - Department of Plant Pathology, Davis, CA, U.S.A.; (2) University of California, Davis - Department of Plant Pathology, Davis , CA, U.S.A.; (3) CSIR-Crops Research Institute, Kumasi, Ghana; (4) University of California, Davis, Davis, CA, U.S.A.

Plant Stress and Abiotic Disorders

573-P Dissecting the various responsive modes to drought stress responses in corn with contrasting tolerance to drought.
L. YANG (1), J. Fountain (1), T. Jiang (2), D. Lee (3), R. Kemerait (1), B. Scully (4), S. Chen (5), B. Guo (6); (1) University of Georgia, Department of Plant Pathology, Tifton, GA, U.S.A.; (2) Northeast Forestry Universit, Harbin, China; (3) University of Georgia, Department of Crop and Soil Sciences, Tifton, GA, U.S.A.; (4) USDA-ARS, U.S. Horticultural Research Laboratory, Fort Pierce, FL, U.S.A.; (5) University of Florida, Department of Biology, Genetics Institute, and Plant Molecular & Cellular Biology Program, Gainesville, FL, U.S.A.; (6) USDA ARS CPMRU, Tifton, GA, U.S.A.

574-P Effects of Salinity on Root Rot of Soybean Caused by *Fusarium avenaceum*.
K. F. CHANG (1), S. F. Hwang (2), H. U. Ahmed (2), Q. Zhou (2), S. E. Strelkov (3), R. L. Conner (4), D. L. McLaren (5), B. D. Gossen (6), G. D. Turnbull (1), M. W. Harding (7); (1) Alberta Agriculture & Rural Development, Edmonton, AB, Canada; (2) Alberta Agriculture and Rural Development, Edmonton, AB, Canada; (3) University of Alberta, Edmonton, AB, Canada; (4) Agriculture and Agri-Food Canada, Morden, MB, Canada; (5) Agriculture and Agri-Food Canada, Brandon, MB, Canada; (6) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (7) Alberta Agriculture & Rural Development, Brooks, AB, Canada

575-P The effect of nuclear-cytoplasmic interactions on resistance to *Parastagonospora nodorum* in wheat.
A. F. ALHASHEL (1), S. Meinhardt (1), S. F. Kianian (2); (1) North Dakota State Uinersity, FARGO, ND, U.S.A.; (2) CEREAL DISEASE LABORATORY, Saint Paul, MN, U.S.A.

576-P Interactive effects of water stress and *Neofusicoccum parvum* on Botryosphaeria dieback of grapevines.
D. LAWRENCE (1), E. Galarneau (2), R. Travadon (3), K. Baumgartner (2); (1) Univ of California, Davis, CA, U.S.A.; (2) USDA, Davis, CA, U.S.A.; (3) University of California, Davis, Davis, CA, U.S.A.

577-P Effects of temperature and pH on *Fusarium oxysporum* and soybean seedling disease.
D. R. CRUZ (1), L. F. Leandro (1), G. P. Munkvold (1); (1) Iowa State University, Ames, IA, U.S.A.

578-P Temperature effects on lesion development and on R-genes when infected by *Leptosphaeria maculans* causing blackleg disease of canola.
D. FERNANDO (1), L. Rong (2), H. Borhan (3); (1) Univ of Manitoba, Winnipeg, MB, Canada; (2) Uni of Manitoba, Winnipeg, MB, Canada; (3) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

Analytical and Theoretical Plant Pathology

579-P Meta-analytical Synthesis of Ten Years of DMI and DMI + QoI Fungicide Trials for Managing Soybean Rust in Brazil.
F. DALLA LANA (1), C. Vieira Godoy (2), P. Anderson Paul (1), E. Medeiros Del Ponte (3); (1) The Ohio State University, Wooster, OH, U.S.A.; (2) Embrapa Soja, Londrina, Brazil; (3) Universidade Federal de Viçosa, Viçosa , Brazil

580-P How rater bias and assessment method used to estimate disease severity affect hypothesis testing in different experimental designs.
K. S. CHIANG (1), C. H. Bock (2), I. H. Lee (1), M. El Jarroudi (3), P. Delfosse (4); (1) National Chung Hsing Univ, Taichung, Taiwan; (2) USDA-ARS-SEFTNRL, Byron, GA, U.S.A.; (3) Univ of Liege, Arlon, Belgium; (4) Luxembourg Institute of Science and Technology (LIST), Belvaux, Luxembourg

581-P A comparative analysis of sequence variations in the *TRI8* gene among different species in the *Fusarium graminearum* species complex.
D. FERNANDO (1), C. Amarasinghe (2); (1) Univ of Manitoba, Winnipeg, MB, Canada; (2) Uni of Manitoba, Winnipeg, MB, Canada

582-P Using the relationship between foliar emission rate and disease progress over time as a tool for managing black sigatoka in plantain.
L. GAÑÁN (1), E. Alvarez (1); (1) International Center for Tropical Agriculture, Palmira, Colombia

Cropping Systems/Sustainability

583-P Effects of application parameters on spray deposition and uniformity on wheat stem.
W. B. MORAES (1), H. E. Ozkan (2), D. C. Richard (3), H. Zhu (3), L. V. Madden (1), P. A. Paul (1); (1) Department of Plant Pathology, The Ohio State University, Wooster, OH, U.S.A.; (2) Department of Food, The Ohio State University, Columbus, OH, U.S.A.; (3) USDA-ARS Application Technology Research Unit, Wooster, OH, U.S.A.

584-P The integration of fungicide application and host resistance on blast progress on wheat under field conditions.
J. A. RIOS (1), F. . Rodrigues (1), V. S. Rios (1), P. A. Paul (2), M. A. Souza (3), L. Araújo (1); (1) Department of Plant Pathology, Universidade Federal de Viçosa, Viçosa, Brazil; (2) Department of Plant Pathology, The Ohio State University, Wooster, OH, U.S.A.; (3) Department of Crop Science, Universidade Federal de Viçosa, Viçosa, Brazil

585-P Components of yield in pecan depend on tree height due to the distribution of scab in the canopy.
C. H. BOCK (1), M. W. Hotchkiss (1), B. W. Wood (1); (1) USDA-ARS-SEFTNRL, 21 Dunbar Rd., Byron, GA, U.S.A.

586-P Temporal progress and interaction of irrigation with phosphorus levels in brown eye spot of coffee.
E. Chaves (1), E. A. POZZA (1), G. A. Dornelas (1), A. A. A. Pozza (1), M. S. Scalco (2), R. J. Guimarães (1); (1) Federal University of Lavras, Lavras, Brazil; (2) EMBRAPA/UFLA, Lavras, Brazil

587-P Cumulative and residual effects of potato cropping system management strategies on soil physical, chemical, and biological properties.
R. P. LARKIN (1); (1) USDA ARS, Orono, ME, U.S.A.

Pathogens Dispersal and Spatial/ Temporal Distribution

588-P Computational pipeline to improve detection accuracy of plant pathogens from NGS datasets using signature oligonucleotides.
C. LOWE (1), M. Zahariev (2), M. Liu (1), S. Hambleton (1), K. Seifert (1), C. A. Levesque (1), W. Chen (1); (1) Agriculture and Agri-Food Canada, Ottawa, ON, Canada; (2) Skwez Technology Corp, Garibaldi Highlands, BC, Canada

589-P Effects of wheat varietal resistance level and rainfall characteristics on splash dispersal of septoria tritici blotch.
T. Vidal (1), P. Lusley (2), C. GIGOT (3), M. Leconte (4), F. Suffert (4), C. de Vallavieille-Pope (4), L. Huber (5), S. Saint-Jean (5); (1) AgroParisTech / INRA EcoSys, 78850 Thiverval-Grignon, France; (2) INRA / AgroParisTech EcoSys, Thiverval Grignon, France; (3) Quantitative Biology and Epidemiology Lab, Plant Pathology Department, University of California, Davis, CA, U.S.A.; (4) INRA Bioger, Thiverval-Grignon, France; (5) AgroParisTech / INRA EcoSys, Thiverval-Grignon, France

590-P *Magnaporthe oryzae* conidia on basal wheat leaves as a potential source of wheat blast inoculum.
C. CRUZ (1), J. Kiyuna (2), W. Bockus (1), T. Todd (1), B. Valent (1); (1) Kansas State University, Manhattan, KS, U.S.A.; (2) CETABOL, Santa Cruz de la Sierra, Bolivia

591-P Effect of wetness duration on the spread of three species in the sooty blotch and flyspeck complex in an Iowa apple orchard.
E. HERNANDEZ (1), J. C. Batzer (2), H. Rolsi (1), M. L. Gleason (1); (1) Iowa State University, Ames, IA, U.S.A.; (2) Iowa State Univ, Ames, IA, U.S.A.

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592-P Presence of viable oospores of *Peronospora effusa* in spinach seeds.
S. KUNJETI (1), A. Anchieta (2), R. Pena (3), K. V. Subbarao (4), S. T. Koike (5), S. J. Klosterman (2); (1) University of California, Davis, Salinas, CA, U.S.A.; (2) USDA-ARS, Salinas, CA, U.S.A.; (3) USDA, ARS, Salinas, CA, U.S.A.; (4) University of California, Davis, Davis, CA, U.S.A.; (5) Cooperative Extension Monterey County, Salinas, CA, U.S.A.

593-P Role of vector mealybugs in spreading *Grapevine leafroll associated virus-5* (GLRaV-5) through the main grape growing areas in Turkey.
N. BUZKAN (1), M. Gumus (2), A. A. Isikber (3), Y. Ben-Dov (4); (1) Kahramanmaras Sutcu Imam Univ, Kahramanmaras, Turkey; (2) Ege University Agriculture Faculty Plant Protection Department, Izmir, Turkey; (3) Kahramanmaras Sututcu Imam Univ, Kahramanmaras, Turkey; (4) The Volcani Center Department of Entomology, Bet Dagan, Israel

594-P Spatio-temporal characterization of plant pathogenic *Streptomyces* species in Wisconsin.
B. J. WEBSTER (1), L. A. Wanner (2), A. J. Gevens (1); (1) University of Wisconsin, Madison, WI, U.S.A.; (2) USDA ARS, Beltsville, MD, U.S.A.

595-P Identifying Spatial Distribution of Seedling Disease Pressure in Cotton Fields.
K. D. WILSON (1), C. S. Rothrock (1), T. N. Spurlock (2); (1) University of Arkansas, Fayetteville, AR, U.S.A.; (2) University of Arkansas Southeast Research and Extension Center, Monticello, AR, U.S.A.

596-P Effect of cultivar resistance, soil management and soil solarization on spatio-temporal development of Verticillium wilt of olive: a long-term study.
E. OSTOS (1), R. PORRAS (2), F. J. LOPEZ-ESCUDERO (1), A. TRAPERO-CASAS (1), J. MORAL (3); (1) UNIVERSITY OF CORDOBA, CORDOBA, Spain; (2) BIOGEOS S.L., CORDOBA, Spain; (3) UNIVERSITY OF CORDOBA, Cordoba, Spain

597-P Evaluation of *Sclerotium cepivorum* distribution in naturally infested commercial fields in Central California.
T. TURINI (1), A. Biscaro (2), R. M. Davis (3); (1) Univ of California Coop Ext Svc, Fresno, CA, U.S.A.; (2) University of California Cooperative Extension, Ventura, CA, U.S.A.; (3) University of California, Davis, CA, U.S.A.

598-P Spread of clubroot on canola in North America, 2003-2014.
B. D. GOSSEN (1), S. Strelkov (2), V. P. Manolii (3), T. Cao (3), S. F. Hwang (4), G. Peng (5), M. R. McDonald (6); (1) Agric & Agri-Food Canada, Saskatoon, SK, Canada; (2) Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada; (3) Department of Agriculture, Food and Nutrition, University of Alberta, Edmonton, AB, Canada; (4) Alberta Agriculture, Edmonton, AB, Canada; (5) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (6) Univ of Guelph, Guelph, ON, Canada

599-P Spatial distribution of *Phytophthora rubi* and *Pratylenchus penetrans* in Northwest red raspberry fields.
D. KROESE (1), I. Zasada (2), N. Grünwald (2), J. Weiland (2); (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA ARS HCRL, Corvallis, OR, U.S.A.

600-P Developing a new approach to study the distribution of different genotypes of *Citrus tristeza virus* within citrus plants.
M. BERGUA (1), D. M. Phelan (1), A. Bak (1), D. C. Bloom (1), S. Y. Folimonova (1); (1) University of Florida, Gainesville, FL, U.S.A.

601-P Distribution, prevalence, and incidence of *Sugarcane Yellow Leaf Virus* (SCYLV) in sugarcane in Colombia.
M. Cadavid (1), J. C. Angel (1), M. L. Guzmán (1), F. A. Herrera (1), J. I. Victoria (1), C. A. ANGEL (1); (1) Colombian Sugarcane Research Center - CENICAÑA, Cali, Colombia

602-P Incidence of begomovirus and tospovirus diseases in processing tomato fields in three midwest states of Brazil in 2013 and 2014.
M. MACEDO (1), R. Gilbertson (1), A. Bergamin Filho (2); (1) Universidad of Davis, davis, CA, U.S.A.; (2) Escola Superior de Agronomia Luiz de Queiroz, Piracicaba, Brazil

Pathogen-Vector Interactions

603-P Lipopolysaccharide modulates the vector-pathogen interface of the bacterial phytopathogen, *Xylella fastidiosa*.
J. RAPICAVOLI (1), N. Kinsinger (1), T. M. Perring (1), C. M. Johnston (1), S. Walker (1), M. C. Roper (1); (1) University of California, Riverside, CA, U.S.A.

604-P Characterization of North American Grapevine Yellows.
P. LENZI (1), T. Stoepler (1), D. Melby (1), T. Wof (1); (1) Virginia Tech, Winchester , VA, U.S.A.

605-P Liberibacter and psyllid derived proteins bind *Candidatus* L. asiaticus bacteriophage late gene promoter.
L. A. FLEITES (1), M. Jain (1), D. W. Gabriel (1); (1) University of Florida, Gainesville, FL, U.S.A.

606-P Analysis of the virus-insect vector interactome of *Maize mosaic rhabdovirus* glycoprotein.
K. BARANDOC- ALVIAR (1), D. Rotenberg (1), A. Whitfield (1); (1) Kansas State University, Manhattan, KS, U.S.A.

607-P Whole-genome expression analysis of Rice black-streaked dwarf virus in different plant hosts and small brown planthopper.
Q. XU (1), Y. Zhou (1); (1) Jiangsu Academy of Agricultural Sciences, Nanjing, China

608-P Southern rice black-streaked dwarf virus alters the temperature fitness of its insect vector white-backed planthopper.
G. ZHOU (1), M. Zhang (2), D. Xu (2); (1) South China Agric Univ, Guangdong, China; (2) South China Agricultural University, Guangzhou, China

609-P Epidemiology of the *Rose rosette virus*.
P. L. DI BELLO (1), I. E. Tzanetakis (1); (1) University of Arkansas, Fayetteville, AR, U.S.A.

610-P Elevated CO2 impacts bell pepper growth with consequences in the feeding behaviour and performance of the green peach aphid, *Myzus persicae*.
B. Dader (1), A. Fereres (1), A. Moreno (2), P. TREBICKI (3); (1) Institute of Agricultural Sciences, Spanish Council for Scientific Research, Madrid, Spain; (2) Institute of Agricultural Sciences, Spanish Council for Scientific Research, Madrid , Spain; (3) Department of Economic Development, Horsham, , Australia

Population Biology

611-P Parametrization of evolutionary mechanisms of *Ralstonia solanacearum* in Brazil using genealogies and the coalescent approach.
T. R. SANTIAGO (1), G. Caetano-Anolles (2), C. A. Lopes (3), E. Mizubuti (4); (1) Universidade Federal de Viçosa, Viçosa, Brazil; (2) University of Illinois, Urbana, IL, U.S.A.; (3) Embrapa Hortaliças, Gama, U.S.A.; (4) Univ Federal De Vicosa, Vicosa, Brazil

612-P First study on the genetic diversity of *Clavibacter michiganensis* subsp. *michiganensis* strains isolated from tomato crops in Uruguay.
V. Croce (1), M. González (2), M. A. Jacques (3), M. J. PIANZZOLA (1), M. I. Siri (1); (1) Universidad de la República, Montevideo, Uruguay; (2) Instituto Nacional de Investigaciones Agropecuarias, Salto, Uruguay; (3) Institut de Recherches en Agriculture et Semences, Angers, France

613-P Using Genotyping-by-sequencing (GBS) to study the population genetics of the fungus *Fusarium proliferatum*.
A. REYES GAIGE (1), W. Yue (1), C. Toomajian (1), J. P. Stack (1); (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.

614-P Genetic and pathogenic diversity of the net and spot forms of the barley net blotch pathogen in western Canada.

A. AKHAVAN (1), T. K. Turkington (2), H. Askarian (1), A. Tekauz (3), K. Xi (4), R. Kutcher (5), J. Tucker (6), S. Strelkov (7); (1) University of Alberta, Edmonton, AB, Canada; (2) Agriculture and Agri-Food Canada, Lacombe Research Centre, Lacombe, AB, Canada; (3) Agriculture and Agri-Food Canada, Cereal Research Centre, Winnipe, MB, Canada; (4) Alberta Agriculture, Food and Rural Development, Field Crop Development Centre, Lacombe, AB, Canada; (5) Crop Development Centre, University of Saskatchewan, Saskatoon, SK, Canada; (6) Agriculture and Agri-Food Canada, Brandon Research Centre, Brandon, MB, Canada; (7) Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada

615-P Reaction of global collection of Rye germplasm to tan spot *Pyrenophora tritici-repentis*race1, 5 and Ptr ToxA.

S. Abdullah (1), S. ALI (2), K. Glover (3), S. Sehgal (3); (1) South Dakota State Univ, Brookings, SD, U.S.A.; (2) South dakota State University, Brookings, SD, U.S.A.; (3) South Dakota State University, Brookings, SD, U.S.A.

616-P The population of *Sclerotinia sclerotiorum* from common bean in Brazil is structured by mycelial compatibility groups.

M. S. Lehner (1), T. J. Paula Júnior (2), J. E. S. Carneiro (1), E. S. G. MIZUBUTI (3); (1) Univ Federal De Vicosa, Viçosa, Brazil; (2) EPAMIG, Viçosa, Brazil; (3) Univ Federal De Vicosa, Vicosa, Brazil

617-P Genetic diversity in *Fusarium andiyazi* populations from sorghum.

V. BUSHULA (1), J. F. Leslie (2), C. R. Little (2); (1) Kansas State Univ, Manhattan, KS, U.S.A.; (2) Kansas State University, Manhattan, KS, U.S.A.

618-P Stripe rust epidemics of wheat and barley and races of *Puccinia striiformis* identified in the United States in 2014.

A. WAN (1), X. Chen (2); (1) Washington State University, Pullman, WA, U.S.A.; (2) USDA ARS, Pullman, WA, U.S.A.

619-P Characterization of *Pyrenophora tritici-repentis* isolates from Rye in South Dakota.

S. Abdullah (1), S. K. Sehgal (2), K. Glover (2), S. ALI (2); (1) South dakota State University, Brookings, SD, U.S.A.; (2) South Dakota State University, Brookings, SD, U.S.A.

620-P Race structure and genetic diversity of *Pyrenophora tritici-repentis* population in North Dakota.

G. Ameen (1), Z. LIU (2), M. Mergoum (1); (1) North Dakota State University, Fargo, ND, U.S.A.; (2) North Dakota State Univ, Fargo, ND, U.S.A.

621-P Phenotypic and genotypic characterization of isolates of the wheat stem rust pathogen collected from epidemic regions in East Africa in 2013 and 2014.

Y. JIN (1), P. Olivera (2), M. Newcomb (2), G. Woldeab (3), E. Hailu (3), R. Wanyera (4), D. Hodson (5), M. Rouse (6), D. Luster (7), L. Szabo (6), Y. Jin (1); (1) USDA ARS, St Paul, MN, U.S.A.; (2) University of Minnesota, Department of Plant Pathology, St. Paul, MN, U.S.A.; (3) Ethiopian Institute of Agricultural Research, Ambo Center, Ambo, , Ethiopia; (4) Kenya Agricultural Research Institute, Njoro, , Kenya; (5) CIMMYT-Ethiopia, Addis Ababa, , Ethiopia; (6) USDA ARS, St. Paul, MN, U.S.A.; (7) USDA ARS, Fort Detrick, MD, U.S.A.

622-P Development of microsatellite markers for *Fusicladium effusum*, the causal agent of pecan scab.

C. H. BOCK (1), C. Chen (1), K. L. Stevenson (2), B. W. Wood (1); (1) USDA-ARS-SEFTNRL, 21 Dunbar Rd., Byron, GA, U.S.A.; (2) University of Georgia, Natural Products Lab, 2360 Rainwater Road, Tifton, GA, U.S.A.

623-P Genetic characterization of the Botrytis population from multiple hosts in the Americas.

A. Amiri (1), N. A. PERES (2); (1) Univ of Florida, Wimauma, FL, U.S.A.; (2) University of Florida, Wimauma, FL, U.S.A.

624-P Worldwide population structure of *Sclerotinia sclerotiorum* from cultivated common bean.

S. E. EVERHART (1), R. Jhala (1), B. S. Amaradasa (2), R. Higgins (1), J. R. Steadman (1); (1) University of Nebraska, Lincoln, NE, U.S.A.; (2) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

625-P Population genomic analyses of the brown root-rot pathogen, *Phellinus noxius,* examine potential introductions to the Pacific islands.

J. E. STEWART (1), M. S. Kim (2), L. Shuey (3), N. Sahashi (4), Y. Ota (4), S. Ashiglar (5), R. L. Schlub (6), P. G. Cannon (7), N. B. Klopfenstein (5); (1) Department of Plant Pathology, University of Georgia, Athens, GA, U.S.A.; (2) Department of Forestry, Environment and Systems, Kookmin University, Seoul, Korea; (3) School of Biological Sciences, The University of Queensland, Brisbane, Australia; (4) Forestry and Forest Products Research Institute, Ibaraki, Japan; (5) USDA Forest Service, Rocky Mountain Research Service, Moscow, ID, U.S.A.; (6) University of Guam, ANR/CES/CNAS, University Station, Mangilao, Guam, U.S.A.; (7) USDA Forest Service – FHP, Region 5, Vallejo, CA, U.S.A.

626-P Molecular characterization and genetic diversity of *Mycospharella fijiensis* , in Costa Rica using sequence based nuclear markers.

S. CHAVAN (1), M. Wyatt (1), L. G. Alpizar (2), M. E. Munoz (3), J. B. Ristaino (1); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) University of Costa Rica, Costa Rica, Costa rica; (3) DOLE - Standard Fruit Co., Costa Rica, Costa rica

627-P Populations of *Fusarium oxysporum* f. sp. *cubense* causing Panama disease of banana in Ecuador: Learning from the past for future perspectives.

F. A. MAGDAMA (1), M. d. Jimenez-Gasco (1); (1) The Pennsylvania State University, University Park, PA, U.S.A.

628-P Microsatellite characterization of *Penicillium digitatum*, causal agent of green mold of citrus.

E. Varady (1), G. Vidalakis (1), G. W. DOUHAN (1); (1) University of California, Riverside, CA, U.S.A.

629-P Molecular Differentiation of *Claviceps* Isolates from Kentucky Bluegrass and Perennial Ryegrass in Oregon and Washington.

J. C. Scott (1), N. Kaur (2), S. C. Alderman (3), D. L. Walenta (4), P. B. Hamm (2), K. E. Frost (2), J. K. S. DUNG (1); (1) Oregon State University, Madras, OR, U.S.A.; (2) Oregon State University, Hermiston, OR, U.S.A.; (3) USDA-ARS NFSPRC, Corvallis, OR, U.S.A.; (4) Oregon State University, La Grande, OR, U.S.A.

630-P Diversity of *Alternaria brassicicola* isolates collected in New York State.

R. A. KREIS (1), C. D. Smart (1), H. R. Dillard (2); (1) Cornell University NYSAES, Geneva, NY, U.S.A.; (2) University of California, Davis, CA, U.S.A.

631-P Forensic application of SSR typing to identify probable sources of Fusarium proliferatum strains associated with salmon blotch of onions.

I. R. Moncrief (1), C. D. Garzon (2), S. M. Marek (2), A. Gamliel (3), J. P. Stack (4), Y. Isack (3), J. FLETCHER (2); (1) Harry S. Truman College, Chicago, IL, U.S.A.; (2) Oklahoma State University, Stillwater, OK, U.S.A.; (3) ARO Volcani Institute, Bet Dagen, Israel; (4) Kansas State University, Manhattan, KS, U.S.A.

632-P Development of microsatellite markers in the watermelon pathogen *Fusarium oxysporum* f. sp. *niveum* using comparative genomics.

N. F. MILLER (1), L. M. Cano (1), L. M. Quesada-Ocampo (1); (1) North Carolina State University, Raleigh, NC, U.S.A.

633-P Population genetic analysis of early blight pathogen, *Alternaria solani* from tomato and potato.

T. ADHIKARI (1), V. Rumsch (1), S. Gurung (2), D. Halterman (3), F. J. Louws (4); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Sakata Seed America, Inc,, Salinas, CA, U.S.A.; (3) USDA/ARS Vegetable Crops Research Unit, Madison, WI, U.S.A.; (4) North Carolina State University, Raleigh, CA, U.S.A.

634-P Population structure of the obligate biotroph *Peronospora tabacina,* the cause of blue mold of tobacco.

D. HADZIABDIC (1), P. Wadl (2), F. Runge (3), J. Ristaino (4), O. Spring (5), R. Trigiano (2); (1) Univ of Tennessee, Knoxville, TN, U.S.A.; (2) University of Tennessee, Knoxville, TN, U.S.A.; (3) University of Hohenheim, Institute of Botany, Stuttgart, Germany; (4) North Carolina State University, Raleigh, NC, U.S.A.; (5) University of Hohenheim, Institute of Botany, Stuttgart, Georgia

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635-P Global population genetic diversity and phylogenetic analysis of *Phytophthora palmivora.*

J. WANG (1), M. D. Coffey (2), E. M. Goss (1); (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of California Riverside, Riverside, CA, U.S.A.

636-P Evolutionary origins of US and famine-era lineages of *Phytophthora infestans.*

J. RISTAINO (1), A. Saville (2), M. Martin (3), J. P. Ristaino (1), M. T. P. Gilbert (4); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Department of Plant Pathology, NC State University, Raleigh, NC, U.S.A.; (3) Center for Theoretical and Evolutionary Genomics, University of California, Berkeley, CA, U.S.A.; (4) Center for Geogenetics, Natural History Museum, university of Copenhage, Copenhageno, Denmark

637-P Host plant resistance against *Tomato spotted wilt vir*us in peanut genotypes and its impact on virus and vector fitness.

R. SRINIVASAN (1), S. Sunadaraj (2), A. Culbreath (2), D. Riley (2), H. Pappu (3); (1) Univ of Georgia, Tifton, GA, U.S.A.; (2) University of Georgia, Tifton, GA, U.S.A.; (3) Washington State University, Pullman, WA, U.S.A.

638-P Genetic diversity and population structure of begomoviruses infecting sweet potato.

M. N. TAHIR (1), F. Li (2), P. Lan (2), D. Mollov (1), G. R. Kinard (1), R. Li (3); (1) USDA-ARS, Beltsville, MD, U.S.A.; (2) Yunnan Agricultural University, Kunming, China; (3) USDA ARS, Beltsville, MD, U.S.A.

Rhizosphere

639-P Microbiota of wild chickpea *Cicer reticulatum*: the examination of plant-microbe interactions.

B. ALFORD (1), A. Greenspan (1), D. Cook (1); (1) UC Davis, Davis, CA, U.S.A.

640-P WITHDRAWN

641-P Bacterial communities on wheat grown under long-term conventional tillage and no-till in the Pacific Northwest of the US.

C. YIN (1), K. L. Schroeder (2), N. Mueth (1), S. H. Hulbert (1), T. Paulitz (3); (1) Washington State University, Pullman, WA, U.S.A.; (2) University of Idaho, Pullman, WA, U.S.A.; (3) USDA ARS, Pullman, WA, U.S.A.

642-P Comparison of Soils and Their Associated Microbial Communities as Affected by Sugarcane Cultivation.

A. F. BIGOTT (1), J. Hoy (1), L. Fultz (1); (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.

643-P Interaction between seedborne *Aspergillus* section Nigri and soilborne *Pythium* species on maize seedling growth.

L. K. WEIENETH (1), G. P. Munkvold (2), A. E. Robertson (1); (1) Iowa State University, Ames, IA, U.S.A.; (2) Iowa State Univ, Ames, IA, U.S.A.

Risk Assessment

644-P A mathematical model for the dynamics of Asian Citrus Psyllid (ACP) spread in different landscapes.

W. LUO (1), T. Gottwald (2); (1) USDA ARS, Ft Pierce, FL, U.S.A.; (2) U.S. Horticultural Research Laboratory, USDA ARS, Fort Pierce, FL, U.S.A.

645-P Local and regional distribution of banana Xanthomonas wilt in space and over time in Kagera, Tanzania.

M. M. SHIMWELA (1), J. B. Jones (1), R. C. Ploetz (2), F. D. Beed (3), W. S. Lee (1), A. H. C. van Bruggen (4); (1) University of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, Homestead, FL, U.S.A.; (3) AVRDC, Bangkok, Thailand; (4) Univ of Florida, Gainesville, FL, U.S.A.

646-P Weather conditions during time of corn silking affects aflatoxin contamination.

K. BOWEN (1); (1) Auburn University, Auburn, AL, U.S.A.

647-P Pre-planting risk assessment models for Stagonospora nodorum blotch in winter wheat.

L. MEHRA (1), C. Cowger (1), P. S. Ojiambo (1); (1) North Carolina State University, Raleigh, NC, U.S.A.

648-P Fitness of *Microdochium majus* and *M. nivale* field isolates with resistance to QoI fungicides.

Y. HAYASHI (1), S. Akino (1), N. Kondo (1); (1) Hokkaido University, Sapporo, Japan

649-P Developing a risk assessment model for wheat blast in the US based on weather conditions that favor rice blast epidemics.

T. FISCHER (1), E. D. De Wolf (1); (1) Kansas State University, Manhattan, KS, U.S.A.

650-P A new model to estimate leaf wetness duration in an apple orchard.

A. LECA (1), B. Boissonnier (2), V. Joubert (1), V. Philion (1); (1) IRDA, Saint-Bruno de Montarville, QC, Canada; (2) Ecole Nationale Agronomique de Toulouse, Castanet-Tolosan, France

651-P Satellite Imagery Helps Assessing the Risk of Soybean Sudden Death Syndrome in Iowa.

X. LI (1), S. Yang (2), C. Chen (1), P. Kyveryga (3), X. Yang (1); (1) Iowa State University, Ames, IA, U.S.A.; (2) School of Life Science, Guizhou Normal University, Guiyang, China; (3) Iowa Soybean Association, Ankeny, IA, U.S.A.

652-P Effects of "Extreme" Diurnal Temperature Highs on Initiation of Infection and Sporulation by *Uromyces transversalis*, Causal Agent of Gladiolus Rust.

M. R. BONDE (1), S. E. Nester (2), C. L. Palmer (3); (1) USDA-ARS, Middletown, MD, U.S.A.; (2) USDA-ARS, Frederick, MD, U.S.A.; (3) IR-4, Rutgers University, Princeton, NJ, U.S.A.

653-P Risk Factors for Perennation of *Podosphaera macularis* and Landscape Level Development of Hop Powdery Mildew.

D. GENT (1), M. Twomey (2), S. Wolfenbarger (3), J. Woods (2); (1) USDA ARS NFSPRC, Corvallis, OR, U.S.A.; (2) USDA-ARS FSCRU, Corvallis, OR, U.S.A.; (3) Oregon State University, Corvallis, OR, U.S.A.

654-P Extent and severity of Caliciopsis canker in New England, U.S.A: an emerging disease of eastern white pine.

I. Munck (1), K. BRODERS (2), W. Livingston (3), K. Lombard (4), T. Luther (5), W. Ostrofsky (6); (1) USDA Forest Service, Durham, NH, U.S.A.; (2) Department of Biological Sciences, University of New Hampshire, Durham, NH, U.S.A.; (3) Scool of Forest Resources, University of Maine, Orono, ME, U.S.A.; (4) New Hampshire Department of Resources and Economic Development, New Hampshire Division of Forests and Lands, Concord, NH, U.S.A.; (5) NA State and Private Forestry, USDA Forest Service, Durham, NH, U.S.A.; (6) Maine Forest Service, Maine Department of Agriculture, Conservation and Forestry, Augusta, ME, U.S.A.

655-P Developing bioclimatic models to predict suitable habitat for *Armillaria* spp. in Wyoming.

J. T. Blodgett (1), J. W. Hanna (2), E. W. Pitman (2), S. Ashiglar (2), J. E. Lundquist (3), M. S. Kim (4), A. Ross-Davis (2), N. KLOPFENSTEIN (2); (1) USDA Forest Service, FHP Region 2, Rapid City, SD, U.S.A.; (2) USDA Forest Service - RMRS, Moscow, ID, U.S.A.; (3) USDA Forest Service, FHP Region 10/PNWRS, Anchorage, AK, U.S.A.; (4) Kookmin University - Dept. Forestry, Environment and Systems, Seoul, South Korea

656-P A low temperature threshold is important for predicting clubroot development.

M. R. MCDONALD (1), T. Cranmer (2), T. Gludovacz (2), B. D. Gossen (3); (1) Univ of Guelph, Guelph, ON, Canada; (2) University of Guelph, Guelph, ON, Canada; (3) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

657-P Invasion and saturation risk of pathogens and pests based on global cropland connectivity: the case of banana, cassava, potato, sweetpotato, and yam.

J. F. HERNANDEZ NOPSA (1), Y. Xing (2), J. Andrade-Piedra (3), F. Beed (4), G. Blomme (5), M. Carvajal Yepes (6), D. Coyne (7), G. A. Forbes (8), J. Kreuze (9), J. Kroschel (10), L. Kumar (11), J. Legg (12), M. Parker (13), E. Schulte-Geldermann (13), K. A. Garrett (14); (1) University of Florida and Kansas State Univ, Manhattan, KS, U.S.A.; (2) University of Florida and Kansas State Univeristy, Gainesville, FL, U.S.A.; (3) International Potato Center (CIP), Quito, Ecuador; (4) AVRDC – The World Vegetable Center, Bangkok, Thailand; (5) Bioversity, Kampala, Uganda; (6) International Center for Tropical Agriculture (CIAT), Cali, Colombia; (7) International Institute of Tropical Agriculture (IITA), Nairobi, Kenya; (8) International Potato Center (CIP), Beijing, China; (9) International Potato Center (CIP), Lima, Peru; (10) International Potato Center (CIP) / Global Crop Diversity Trust, Filderstadt, Germany; (11) International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria; (12) International Institute of Tropical Agriculture (IITA), Dar es Salaam, Tanzania; (13) International Potato Center (CIP), Nairobi, Kenya; (14) University of Florida (UF) and Kansas State University (KSU), Gainesville, FL, U.S.A.

658-P Spatial and temporal model for epidemics of oil palm bud rot in the Middle Magdalena River Valley in Colombia.

E. R. BENITEZ (1), C. Garcia (1); (1) Univ Nacl de Colombia, Bogota, Colombia

659-P Impact Network Analysis of potato seed systems: The CONPAPA case in Ecuador.

J. F. HERNANDEZ NOPSA (1), J. Andrade-Piedra (2), G. A. Forbes (3), L. Montesdeoca (4), F. Montesdeoca (5), K. A. Garrett (6); (1) University of Florida and Kansas State Univ, Manhattan, KS, U.S.A.; (2) International Potato Center (CIP), Quito, Ecuador; (3) International Potato Center (CIP), Beijing, China; (4) CONPAPA, Ambato, Ecuador; (5) Universidad Central del Ecuador, Quito, Ecuador; (6) University of Florida (UF) and Kansas State University (KSU), Gainesville, FL, U.S.A.

660-P Predicting in-season infection risk of cucurbit host types by *Pseudoperonospora cubensis* using weather variables.

K. N. NEUFELD (1), A. P. Keinath (2), P. S. Ojiambo (1); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) Clemson University, Charleston, SC, U.S.A.

661-P *Wheat streak mosaic virus* risk assessment models in the Central Great Plains.

D. DEISHER (1), E. DeWolf (1); (1) Kansas State University, Manhattan, KS, U.S.A.

662-P 'Shiny' interfaces for interactive data collection and reporting in Plant Pathology.

S. THOMAS-SHARMA (1), Y. Xing (2), G. Forbes (3), K. Garrett (2); (1) University of Wisconsin, Madison, WI, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.; (3) International Potato Center, Beijing, China

Systematics/Evolution

663-P Comparative genomics analysis suggests positive selection is the main driving force for evolution of citrus canker causing *Xanthomonas*.

Y. ZHANG (1), N. Jalan (1), X. Zhou (1), E. M. Goss (2), J. B. Jones (2), J. C. Setubal (3), X. Deng (4), N. Wang (1); (1) Citrus Research and Education Center, Department of Microbiology and Cell Science, University of Florida, Lake Alfred, FL, U.S.A.; (2) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (3) Departamento de Bioquímica, Instituto de Química, Universidade de São Paulo, São Paulo, Brazil; (4) Department of Plant Pathology, South China Agricultural University, Guangzhou, China

664-P Determination of the pathovar status of bacterial strains known to belong to *Pseudomonas cannabina*.

E. I. ALGER (1), I. Rubio (2), P. Goldman (3), J. Elphinstone (4), D. Stead (4), C. T. Bull (5); (1) Undergraduate Research Opportunities Center, California State Univeristy Monterey Bay, Seaside, CA, U.S.A.; (2) Department of Plant Pathology, University of Wisconsin, Madison, WI, U.S.A.; (3) USDA, ARS, Salinas, CA, U.S.A.; (4) The Food and Environment Research Agency, York, United Kingdom; (5) USDA ARS, Salinas, CA, U.S.A.

665-P Analysis of the core genome of *Streptomyces* species reveals novel and robust genetic markers for phylogenetic reconstruction.

Y. ZHANG (1), J. Huguet-Tapia (1), R. Loria (1); (1) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.

666-P Genomes come from organisms—the continued importance of voucher specimens in fungal identification.

M. ROMBERG (1), C. Blomquist (2); (1) USDA APHIS PPQ NIS, Beltsville, MD, U.S.A.; (2) California Department of Food and Agriculture, Sacramento, CA, U.S.A.

667-P A Global Analysis of the Emergence and Evolutionary Lineages of Potato virus Y Strains.

G. Raikhy (1), S. Gray (2), H. PAPPU (1); (1) Washington State University, Pullman, WA, U.S.A.; (2) USDA-ARS, Ithaca, NY, U.S.A.

Biochemistry and Cell Biology

668-P Phenylalanine ammonia lyase pathway components contribute to resistance of *Arabidopsis thaliana* seeds to *Aspergillus* infection.

M. BRODHAGEN (1), J. C. Young (1), A. Batson (1), Z. Cranny (1), T. DeSitter (1), M. Lahman (1); (1) Western Washington Univ, Bellingham, WA, U.S.A.

669-P Characterization of *stuA* mutants in the mycotoxigenic maize pathogen *Fusarium verticillioides*.

M. RATH (1), N. J. Crenshaw (2), S. E. Gold (2); (1) Dept. of Plant Pathology, University of Georgia, Athens, GA, U.S.A.; (2) Toxicology and Mycotoxin Research Unit, USDA-ARS, Athens, GA, U.S.A.

670-P cAMP-dependent protein kinase A globally regulates pathogenic differentiation in the rice blast fungus *Magnaporthe oryzae*.

Y. LI (1); (1) Purdue Univ, West Lafayette, IN, U.S.A.

671-P Role of GATA transcription factors during infection of the rice blast fungus *Magnaporthe oryzae*.

M. MARROQUIN-GUZMAN (1), R. A. Wilson (2); (1) Univ of Nebraska, Lincoln, NE, U.S.A.; (2) University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

672-P Physiological aspects of *Bipolaris oryzae*-infected rice plants mediated by a strobilurin fungicide.

D. DEBONA (1), K. J. Nascimento (2), J. G. Gomes (3), C. E. Aucique-Pérez (1), F. A. Rodrigues (1); (1) Universidade Federal de Viçosa, Viçosa, Brazil; (2) Instituto Federal de Goiás, Rio Verde, Brazil; (3) Universidade Federal de Viçosa, Rio Paranaíba, Brazil

673-P The use of spectroscopy techniques in investigating the underlying mechanism of resistance to Fusarium head blight in wheat.

R. LAHLALI (1), L. Wang (2), S. Kumar (1), P. R. Fobert (2), G. Peng (3), E. Hallin (1), C. Karunakaran (1); (1) Canadian Light Source Inc., Saskatoon, SK, Canada; (2) National Research Council Canada, Saskatoon, SK, Canada; (3) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada

674-P WITHDRAWN

675-P Sclerotial development in *Sclerotinia sclerotiorum* depends on low pH, independent of oxalic acid production.

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676-P WITHDRAWN

677-P Pyrimidine salvage by Uracil Phosphoribosyltransferase (UPRT) of *Phytophthora infestans* in late blight disease in *Solanum tuberosum*.

K. PRIETO (1), M. Garavito (2), J. J. Vásquez (2), B. H. Zimmermann (2), S. Restrepo (2); (1) Universidad de los Andes, Bogota, Colombia; (2) Universidad de los Andes, Bogotá, Colombia

678-P WITHDRAWN

(continued)

679-P Curtovirus capsid protein interaction with a GroEL- like protein produced by the bacterial endosymbiont of the vector beet leafhopper.
T. NUSAYR (1), R. Creamer (1); (1) New Mexico State University, Las Cruces, NM, U.S.A.

680-P WITHDRAWN

Molecular Aspects of Effectors and Their Host Targets

681-P Characterization of targets of PthA4 and their involvement in citrus canker development.
S. DUAN (1), H. Jia (2), G. Siddrame (1), J. B. Jones (3), N. Wang (4); (1) citrus research and education station, lake alfred, FL, U.S.A.; (2) University of Florida, Lake Alfred, FL, U.S.A.; (3) Department of Plant Pathology, University of Florida, Gainesville, FL, U.S.A.; (4) University of Florida - CREC, Lake Alfred, FL, U.S.A.

682-P Differential host specificity of the two related pathovars *Pantoea agglomerans* pvs. *gypsophilae* and *betae* as expressed by type III effectors.
M. Gershovitz (1), G. Nissan (2), L. Chalupowicz (3), M. Morozov (4), S. Manulis-Sasson (5), G. Sessa (2), T. Pupko (2), I. BARASH (6); (1) Tel Aviv University, Trl Aviv, Israel; (2) Tel Aviv University, Tel Aviv, Israel; (3) ARO, The Volcani Center, Bet Dagan, Israel; (4) Tel Aviv university, Tel Aviv, Israel; (5) ARO, The Volcani, Center, Bet Dagan, Israel; (6) Tel Aviv Univ, Tel Aviv, Israel

683-P Identification of genes associated with biofilm formation in the phytopathogen *Pectobacterium* subsp. *Brasiliense*.
E. M. ONKENDI (1), I. Toth (2), L. N. Moleleki (1); (1) University of Pretoria, Pretoria, South Africa; (2) The James Hutton Institute, Dundee, Scotland

684-P Genomics and genetic approaches to understanding the interplay between *Ralstonia solanacearum* type III effectors and the resistance R genes.
A. A. KHAN (1), G. S. Ali (2), D. J. Norman (2); (1) Univ of Florida, Orlando, FL, U.S.A.; (2) University of Florida, Apopka, FL, U.S.A.

685-P A ToxA-like protein from *Cochliobolus heterostrophus* induces light-dependent leaf necrosis with host selectivity on maize.
S. LU (1), M. C. Edwards (1); (1) USDA-ARS Cereal Crops Research Unit, Fargo, ND, U.S.A.

686-P Exploring the dark Side: Identification of candidate Ug99 effectors that interact with the barley *rpg4/Rpg5* locus.
R. SHARMA POUDEL (1), S. Solanki (1), R. Brueggeman (1); (1) North Dakota State University, Fargo, ND, U.S.A.

687-P WITHDRAWN

688-P Identification of candidate effector proteins potentially involved in *Fusarium graminearum*-wheat interactions.
S. LU (1), M. C. Edwards (1); (1) USDA-ARS Cereal Crops Research Unit, Fargo, ND, U.S.A.

689-P WITHDRAWN

690-P Virulence determination of *Phytophthora infestans* effector IPI-O1 and IPI-O4.
Y. CHEN (1), J. Jiang (1), D. Halterman (2); (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) United States Department of Agriculture, Madison, WI, U.S.A.

Molecular Plant-Microbe Interactions

691-P Engineering broad resistance tailored against rice bacterial blight in Mali.
H. Doucoure (1), F. Auguy (1), C. Tekete (2), M. Hutin (1), S. Baufume (1), R. Koebnik (1), B. Szurek (1), O. Koita (2), V. VERDIER (3), S. Cunnac (1); (1) Institut de Recherche pour le Developpement, Montpellier, France; (2) Laboratoire de Biologie Moléculaire Appliquée, Université des Sciences Techniques et Technologiques de Bamako, Bamako, Mali; (3) Institut de Recherche Pour Le Développement, 34394 Montpellier Cedex 5, France

692-P Antimicrobial-independent disease suppression by lipopeptide iturin for a bacterial leaf disease on *Oryza sativa*.
T. KAWASHIMA (1), K. Hashimoto (1), M. Ohbu (1), H. Shinohara (2), K. Yokota (1); (1) Tokyo Univ of Agriculture, Tokyo, Japan; (2) Tokyo Univ of Agriculture, Kanagawa, Japan

693-P Interplay between HrpS and HrpL in regulation of type III secretion system in *Erwinia amylovora*.
J. H. LEE (1), Y. Zhao (1); (1) University of Illinois at Urbana-Champaign, Urbana, IL, U.S.A.

694-P Cellulose is a major component of biofilms formed by *Erwinia amylovora*.
L. F. CASTIBLANCO (1), G. W. Sundin (2); (1) Michigan State Univ, East Lansing, MI, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.

695-P Using fluorescent labeling to gain insight into fire blight disease development.
S. KLEE (1), G. Monshausen (1), T. McNellis (2); (1) Penn State University, State College, PA, U.S.A.; (2) The Pennsylvania State University, State College, PA, U.S.A.

696-P WITHDRAWN

697-P Sharpshooters may be "flying syringes:" first direct evidence of mixed egestion and salivation in inoculation of *Xylella fastidiosa*.
E. A. BACKUS (1), E. E. Rogers (1); (1) USDA-ARS, SJVASC, Parlier, CA, U.S.A.

698-P An endoglucanase/expansin hybrid protein and the type II secretion system affect the virulence and systemic colonization of *Xylella fastidiosa*.
B. M. INGEL (1), P. Wang (1), J. Labavitch (2), M. C. Roper (1); (1) University of California Riverside, Riverside, CA, U.S.A.; (2) University of California Davis, Davis, CA, U.S.A.

699-P Quorum sensing controls Candidatus Liberibacter asiaticus interactions with host plant and insect vector.
N. KILLINY (1); (1) University of Florida, Citrus Research and Education Center, Lake Alfred, FL, U.S.A.

700-P Plant microbiota-driven facilitation of the persistence, growth and internalization of human pathogens on leafy greens.
L. I. RANGEL (1), J. H. J. Leveau (1); (1) University of California Davis, Davis, CA, U.S.A.

701-P Using supervised machine learning to identify host-microbe interaction factors in the soft rot pathogen, *Pectobacterium carotovorum*.
I. RUBIO (1), B. Ma (1), A. Charkowski (1), N. Perna (1); (1) University of Wisconsin-Madison, Madison, WI, U.S.A.

702-P WITHDRAWN

703-P Inorganic nitrogen metabolism in *Ralstonia solanacearum*: functions and regulation.
A. TRUCHON (1), B. Dalsing (1), C. Allen (1); (1) University of Wisconsin, Madison, WI, U.S.A.

704-P Rhizobiome responses to new tomato rootstock systems.
R. POUDEL (1), A. Jumpponen (2), M. Kennelly (1), C. Rivard (3), K. Garrett (4); (1) Kansas State University/ Plant Pathology Department, Manhattan, KS, U.S.A.; (2) Kansas State University/ Department of Biology, Manhattan, KS, U.S.A.; (3) Kansas State University / Horticulture Forestry & Rec, Manhattan, KS, U.S.A.; (4) Kansas State University/ Plant Pathology Department & University of Florida / Institute for Global Food Systems and Plant Pathology Department, Manhattan, KS, U.S.A.

705-P Identification of a previously uncharacterized global regulator in *Pseudomonas syringae* pv. *tomato* DC3000.
M. FISHMAN (1), J. Zhang (1), P. A. Bronstein (2), P. Stoghill (3), M. J. Filiatrault (3); (1) Cornell University, Ithaca, NY, U.S.A.; (2) USDA FSIS, Washington, DC, U.S.A.; (3) USDA ARS, Ithaca, NY, U.S.A.

706-P Horizontal gene transfer confers adaptive advantages to phytopathogenic fungi: a case study of catalase-peroxidase in *Fusarium verticillioides*.
S. GAO (1), S. E. Gold (2), A. E. Glenn (2); (1) University of Georgia, Athens, GA, U.S.A.; (2) USDA ARS, Richard B. Russell Res Center, Toxicology & Mycotoxin Res Unit, Athens, GA, U.S.A.

707-P Small RNA from the wheat stripe rust fungus *Puccinia striiformis* f.sp. *tritici*.
N. A. MUETH (1), S. H. Hulbert (1); (1) Washington State University, Pullman, WA, U.S.A.

708-P Identification of suppressors of hypersentive response from *Puccinia* spp. infecting wheat.
S. RAMACHANDRAN (1), S. Hulbert (1); (1) Washington State University, Pullman, WA, U.S.A.

709-P An analysis of the Magnaporthe oryzae infection process in wheat blast disease.
R. D. CAPOUYA (1), T. K. Mitchell (2); (1) Ohio State Univeristy, Columbus, OH, U.S.A.; (2) Department of Plant Pathology, The Ohio State University, Columbus, OH, U.S.A.

710-P Exogenously derived RNAi signals targeting essential genes of *Puccinia triticina* shows enhanced resistance to leaf rust disease in wheat.
V. PANWAR (1), M. Jordan (2), B. McCallum (2), P. Fobert (3), G. Bakkeren (4); (1) National Research Council of Canada, Morden, MB, Canada; (2) Agriculture and Agri-Food Canada, Morden, MB, Canada; (3) National Research Council of Canada, Saskatoon, SK, Canada; (4) Agriculture and Agri-Food Canada, Summerland, BC, Canada

711-P WITHDRAWN

712-P *Fvstr1*, a striatin ortholog in *Fusarium virguliforme* required for conidiation, conidiophore development, and virulence.
K. T. ISLAM (1), J. P. Bond (1), A. M. Fakhoury (1); (1) Southern Illinois Univ, Carbondale, IL, U.S.A.

713-P Glutathione peroxidase is required for oxidative stress resistance and virulence in the citrus fungal pathogen *Alternaria alternate*.
S. L. Yang (1), K. R. CHUNG (2); (1) University of Florida, Gainesville, FL, U.S.A.; (2) National Chung-Hsing Univ, Taichung Taiwan, Taiwan

714-P Disease severity and colonization of *Fusarium oxysporum* f. sp. *niveum* transformants on watermelon.
P. F. CHANG (1), P. H. Chan (2), Y. H. Lin (3), C. C. Chen (2), K. S. Chen (4), J. W. Huang (2); (1) Department of Plant Pathology, National Chung Hsing University; Agricultural Biotechnology Center, National Chung Hsing University, Taichung City, Taiwan; (2) Department of Plant Pathology, National Chung Hsing University, Taichung City, Taiwan; (3) Department of Plant Medicine, National Pingtung University of Science and Technology, Taichung City, Taiwan; (4) Fengshan Tropical Horticultural Experiment Branch, Agricultural Research Institute, Council of Agriculture, Kaohsiung City, Taiwan

715-P Effector discovery in the necrotrophic fungal plant pathogen *Rhizopus stolonifer*.
L. M. CANO (1), A. Scruggs (1), L. M. Quesada-Ocampo (2); (1) North Carolina State University, Raleigh, NC, U.S.A.; (2) North Carolina University, Raleigh, NC, U.S.A.

716-P Functional characterization of aphid candidate effectors and their potential host targets.
C. LENOIR (1), P. A. Rodriguez (2), M. Jaouannet (2), P. Birch (1), J. Bos (1); (1) The James Hutton Institute / The University of Dundee, Dundee, United Kingdom; (2) The James Hutton Institute, Dundee, United Kingdom

717-P Characterization of the transcriptional profiling of the migratoy root lesion nematode infection on important crop and floral species.
P. VIEIRA (1), S. Wantoch (2), J. Eisenback (3), K. Kamo (2); (1) Dept. of Plant Pathology, Physiology, and Weed Science, Virginia Tech and Floral and Nursery Plants Research Unit, USDA, BELTSVILLE, MD, U.S.A.; (2) USDA-ARS/US National Arboretum, Floral and Nursery Plants Research Unit, USDA, Beltsville, MD, U.S.A.; (3) Dept. of Plant Pathology, Physiology, and Weed Science, Virginia Tech, Blacksburg, VA, U.S.A.

718-P Soybean Cyst Nematodes of Ohio: Deciphering Mechanisms of Virulence.
E. WALSH (1), B. Cassone (2), A. Grenell (3), T. Miller (2), C. G. Taylor (2); (1) Ohio State Univ, Wooster, OH, U.S.A.; (2) Ohio State University, OARDC, Wooster, OH, U.S.A.; (3) The College of Wooster, Wooster, OH, U.S.A.

719-P Reniform nematode (*Rotylenchulus reniformis*) manipulation of host root gene expression during syncytium formation in cotton (*Gossypium hirsutum*).
W. LI (1), W. Li (1), C. Wells (1), P. Agudelo (1); (1) Clemson University, Clemson, SC, U.S.A.

720-P MiR858 mediated post-transcriptional gene silencing of MYB83 regulate Arabidopsis susceptibility to the beet cyst nematode, *Heterodera schachtii*.
S. PIYA (1), T. J. Baum (2), T. Hewezi (1); (1) University of Tennessee, Knoxville, TN, U.S.A.; (2) Department of Plant Pathology, Iowa State University, Ames, IA, U.S.A.

721-P Glycoside Hydrolase family 3 genes may play a role in *Phytophthora sojae* pathogenicity.
M. D. OSPINA-GIRALDO (1), A. Parish (1); (1) Lafayette College, Easton, PA, U.S.A.

722-P Amino terminal region of Phytophthora sojae cel12 endoglucanase confers tissue collapse function in Nicotiana.
R. JONES (1); (1) USDA ARS, Beltsville, MD, U.S.A.

723-P Rpi-blb2-Mediated Hypersensitive Cell Death Caused by Phytophthora infestans AVRblb2 Requires SGT1, but not EDS1, NDR1-Mediated Signaling.
S. K. OH (1); (1) Chungnam National University, Deajeon, South Korea

724-P Interaction dynamics between the potato late blight resistance protein RB and pathogen effectors.
Y. LIN (1), J. Jiang (1), D. Halterman (2); (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) USDA/ARS Vegetable Crops Research Unit, Madison, WI, Madison, WI, U.S.A.

725-P Host eIF4E functions in RNA replication during Bymovirus infection.
H. Li (1), Y. SHIRAKO (1); (1) ANESC, University of Tokyo, 1-1-1 Yayoi, Bunkyo-ku, Tokyo, Japan

726-P Viral suppressors of RNA silencing in Wheat mosaic virus (WMoV).
A. GUPTA K (1), G. L. Hein (2), R. A. Graybosch (3), S. Tatineni (1); (1) United States Department of Agriculture-Agricultural Research Services (USDA-ARS) and Department of Plant Pathology, University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (2) Department of Entomology, University of Nebraska-Lincoln, Lincoln, NE, U.S.A.; (3) United States Department of Agriculture-Agricultural Research Services (USDA-ARS) and Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE, U.S.A.

727-P Biological and molecular characterization of *Bean common mosaic virus* isolates from different pathogenicity groups.
X. FENG (1), J. R. Myers (2), A. V. Karasev (3); (1) University of Idaho, Moscow, ID, U.S.A.; (2) Oregon State University, Corvallis, OR, U.S.A.; (3) Univ of Idaho, Moscow, ID, U.S.A.

728-P The isolation and characterization of a strain of *Cucumber mosaic virus* isolated from an epidemic affecting *Phaseolus vulgaris* in Upstate New York.
J. Thompson (1), J. Langenhan (2), K. Watters (2), J. Lucks (2), M. FUCHS (1), K. Perry (2); (1) Cornell University, Geneva, NY, U.S.A.; (2) Cornell University, Ithaca, NY, U.S.A.

729-P Subcellular localization and characterization of proteins of *Maize mosaic virus*.
K. M. MARTIN (1), M. M. Goodin (2), A. E. Whitfield (1); (1) Kansas State University, Manhattan, KS, U.S.A.; (2) University of Kentucky, Lexington, KY, U.S.A.

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730-P *Fusaruim graminearum* gene *FgHal2* which is down-regulated by Fusaruim graminearum virus 1 (FgV1) infection affects host response to FgV1.
J. Yu (1), K. M. Lee (1), M. Son (1), K. H. KIM (1); (1) Seoul Natl Univ, Seoul, Korea

731-P Using a cucumber mosaic virus vector to investigate the roles of plant microRNAs in symptom induction and host-vector interactions.
D. D. S. ABREU (1), W. Chen (2), T. Tungadi (1), A. M. Murphy (1), Z. Du (2), J. P. Carr (1); (1) University of Cambridge, Cambridge, United Kingdom; (2) Zhejiang Sci-Tech University, Hangzhou, China

732-P Identification of the CaMV gene that overcomes resistance in *Arabidopsis thaliana* ecotype Enkheim (En-2).
M. A. ADHAB (1), C. Angel (2), S. Leisner (3), J. E. Schoelz (1); (1) Division of Plant Sciences, University of Missouri - Columbia, Columbia, MO, U.S.A.; (2) Colombian Sugarcane Research Center - CENICAÑA, Cali, Colombia; (3) Department of Biological Sciences, the University of Toledo, Toledo, OH, U.S.A.

733-P Validation of novel microRNAs and prediction of their targets responding to the infection of *Cucumber green mottle mosaic virus* in cucumber.
C. LIANG (1), H. Liu (2), L. Luo (1), J. Li (1), C. N. Mortensen (3); (1) Department of Plant Pathology/Beijing Engineering Research Center of Seed and Plant Health, China Agricultural University, Beijing, China, Beijing, China; (2) Molecular Plant Pathology, United States Department of Agriculture, Agricultural Research Service, Beltsville, Maryland, USA, Beltsville, MD, U.S.A.; (3) Department of Plant Biology and Biotechnology, Faculty of Life Sciences, University of Copenhagen, Frederiksberg C, Copenhagen, Denmark, Copenhagen, Denmark

734-P Comparison of host-virus protein interaction topologies among luteovirids.
M. M. ALEXANDER (1), J. Chavez (2), S. L. DeBlasio (3), V. Ziegler-Graff (4), V. Brault (5), J. E. Bruce (2), M. Cilia (6); (1) Cornell University, Ithaca, NY, U.S.A.; (2) University of Washington, Seattle, WA, U.S.A.; (3) USDA-Agricultural Research Service; Boyce Thompson Institute for Plant Research, Ithaca, NY, U.S.A.; (4) Le Centre National de la Recherche Scientifique, Paris, France; (5) L'Institut National de la Recherche Agronomique, Colmar, France; (6) USDA-Agricultural Research Service; Boyce Thompson Institute for Plant Research; Cornell University, Ithaca, NY, U.S.A.

735-P A distal stem loop is required for efficient readthrough of PLRV coat protein gene stop codon.
Y. XU (1), S. M. Gray (2); (1) Cornell University, Ithaca, NY, U.S.A.; (2) USDA-Agricultural Research Service; Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.

736-P Analysis of full length infectious genomic cDNA clones of SPFMV.
C. ZHANG (1), C. Zhang (1), T. Benjain (2), G. Smith (2), Y. Meng (2), V. Njiti (2), C. A. Clark (3); (1) Alcorn State University, Clinton, MS, U.S.A.; (2) Alcorn State University, Lorman, MS, U.S.A.; (3) Louisiana State University, Baton Rouge, LA, U.S.A.

Plant Defense Responses

737-P Finding "the right stuff": The search for regulatory patterns underlying defense response gene expression to improve quantitative resistance in rice.
B. W. TONNESSEN (1), R. Mauleon (2), N. Alexandrov (2), J. E. Leach (1); (1) Colorado State University, Fort Collins, CO, U.S.A.; (2) International Rice Research Institute, Los Banos, Philippines

738-P Screening for ISR-eliciting bacteria in citrus.
N. RIERA (1), U. Handique (1), N. Wang (2); (1) University of Florida, Lake Alfred, FL, U.S.A.; (2) University of Florida - CREC, Lake Alfred, FL, U.S.A.

739-P Proteomics analysis reveals novel host molecular mechanisms associated with heat-induced resistance to '*Ca.* Liberibacter asiaticus' in lemon plants.
C. C. Nwugo (1), M. S. Doud (2), Y. Duan (2), H. LIN (3); (1) USDA-ARS, Parlier, CA, U.S.A.; (2) USDA-ARS, Fort Pierce, FL, U.S.A.; (3) USDA ARS PWA, Parlier, CA, U.S.A.

740-P *Ralstonia solanacearum* extracellular nucleases aid bacterial virulence by degrading root extracellular traps and modulating biofilm formation.
T. M. TRAN (1), A. MacIntyre (1), M. Hawes (2), C. Allen (1); (1) University of Wisconsin-Madison, Madison, WI, U.S.A.; (2) Univeristy of Arizona-Tucson, Tucson, AZ, U.S.A.

741-P Phosphorylation of C-terminal threonine on PFLP is required for enhancing resistance to bacterial wilt in *Arabidopsis thaliana*.
T. Y. Chen (1), L. Y. Shiu (1), Y. J. Chen (1), Y. H. LIN (1); (1) National Pingtung University of Science and Technology, Pingtung, Taiwan

742-P Characterization of the *Arabidopsis thaliana* gene *PBL13*.
J. BANDERAS (1), D. Lin (1), G. Coaker (1); (1) University of California Davis, Davis, CA, U.S.A.

743-P Tomato gene has homology to a defense related gene in *Arabidopsis thaliana*. Pereira, J.; Jones, J.B.; Mou, Z. University of Florida.
J. PEREIRA (1), J. B. Jones (2), Z. Mou (2); (1) Univ of Florida, Gainesville, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.

744-P Nitric oxide produced by *Ralstonia solanacearum* affects tomato defense responses.
L. M. KIIRIKA (1), B. Dalsing (2), C. Allen (1); (1) University of Wisconsin, Madison, WI, U.S.A.; (2) University of Wisconsin, Madison, WI, U.S.A.

745-P Identification and characterization of a novel fungal PAMP recognised in diocots.
B. FRANCO (1), P. Birch (2), A. Berepiki (1), A. Avrova (1); (1) James Hutton Institute, Dundee, United Kingdom; (2) University of Dundee - James Hutton Institute, Dundee, United Kingdom

746-P Identification and characterization of resistance related genes in soybean to *Phakopsora pachyrhizi* infection.
D. HU (1), D. R. Walker (2), Z. Chen (1); (1) Department of Plant Pathology and Crop Physiology, Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.; (2) USDA-ARS Soybean/Maize Germplasm, Pathology, and Genetics Research Unit, Urbana, IL, U.S.A.

747-P Soybean Respiratory burst oxidase homologs are required for white mold disease development.
A. RANJAN (1), D. L. Smith (2), M. Kabbage (2); (1) Univ of Wisconsin, Department of Plant pathology, MADISON, WI, U.S.A.; (2) Department of Plant Pathology, Univeristy of Wisconsin, MADISON, WI, U.S.A.

748-P Ethylene elicits soybean defense responses and reduces symptoms of sudden death syndrome.
N. ABDELSAMAD (1), G. MacIntosh (1), L. Leandro (1); (1) Iowa State Univ, Ames, IA, U.S.A.

749-P Functional genomic analysis of soybean interactions with pathogenic and non-pathogenic isolates of *Fusarium oxysporum*.
A. Lanubile (1), U. K. Muppirala (2), A. J. Severin (2), A. Marocco (1), G. P. MUNKVOLD (3); (1) Univ Cattolica del Sacro Cuore, Piacenza, Italy; (2) Iowa State University, Ames, IA, U.S.A.; (3) Iowa State Univ, Ames, IA, U.S.A.

750-P Characterization of nodal resistance during the interaction between pea (*Pisum sativum*) and white mold, *Sclerotinia sclerotiorum*.
P. SANTOS (1), A. Rojas (2), J. Wang (2), K. McPhee (3), D. Kosma (1), M. Chilvers (2); (1) University of Nevada Reno, Reno, NV, U.S.A.; (2) Michigan State University, East Lansing, MI, U.S.A.; (3) North Dakota State University, Fargo, ND, U.S.A.

751-P Secondary metabolite production and biological activity of endophytic microbes of *Mahonia aquifolium*.
B. Geary (1), T. Smart (1), P. Hatch (1), R. SWEENEY (1); (1) Brigham Young University, Provo, UT, U.S.A.

752-P Evaluation of phytoelicitor activities of three native seaweed species of Trinidad and their influence on pathogenic infections in tomato.
A. RAMKISSOON (1), J. Jayaraman (2), A. Ramsubhag (2); (1) University of the West Indies, Port of Spain, Trinidad and Tobago; (2) University of the West Indies, St. Augustine, Trinidad and Tobago

753-P Differential transcriptional regulation of defense-associated genes among apple rootstock genotypes in response to *Pythium ultimum*.
Y. ZHU (1), M. Mazzola (1), G. Fazio (2); (1) USDA ARS Tree Fruit Research Lab, Wenatchee, WA, U.S.A.; (2) USDA ARS Plant Genetic Resources Unit, Geneva, NY, U.S.A.

754-P WITHDRAWN

755-P Eicosapolyenoic fatty acids induce resistance to *Phytophthora capsici* and alter oxylipin metabolism in tomato.
S. M. ROBINSON (1), R. M. Bostock (1); (1) UC Davis, Davis, CA, U.S.A.

756-P Characterization of the transcriptome and pathogen small RNA associated with stress memory in a commercial crop.
M. L. KALISCHUK (1), D. L. Johnson (2), L. M. Kawchuk (3); (1) Lethbridge College, Lethbridge, AB, Canada; (2) University of Lethbridge, Lethbridge, AB, Canada; (3) Agriculture and Agri-Food Canada, Lethbridge, AB, Canada

Proteomics/Metabolomics/Genomics

757-P Complete Genome Sequence of *Spiroplasma kunkelii*: New Insights Into Spiroplasma Evolution.
R. E. DAVIS (1), J. Shao (1), E. L. Dally (1), Y. Zhao (1), G. E. Gasparich (2), B. J. Gaynor (2), J. Athey (1), N. A. Harrison (3), N. Donofrio (4); (1) Molecular Plant Pathology Laboratory, USDA-Agricultural Research Service, Beltsville, MD, U.S.A.; (2) Department of Biological Sciences, Towson University, Towson, MD, U.S.A.; (3) University of Florida, Ft. Lauderdale Research and Education Center, Davie, FL, U.S.A.; (4) College of Agriculture and Natural Resources, Plant and Soil Sciences, University of Delaware, Newark, DE, U.S.A.

758-P Genome analysis of nonpathogenic *Pseudomonas syringae*: secretion systems, effectors and toxins.
G. BUSOT (1), M. Arif (1), J. P. Stack (1); (1) Department of Plant Pathology, Kansas State University, Manhattan, KS, U.S.A.

759-P Complete genome sequences of xanthomonads causing common bacterial blight of common bean reveal conserved and divergent features.
M. L. O'LEARY (1), G. Coaker (1), R. L. Gilbertson (1); (1) University of California, Davis, Davis, CA, U.S.A.

760-P Genome analysis reveals a complex modular evolution of the biosynthetic pathway for the phytotoxin thaxtomin in plant pathogenic *Streptomyces* species.
J. HUGUET-TAPIA (1), G. Pettis (2), R. Loria (1); (1) Plant Pathology Department, University of Florida, Gainesville, FL, U.S.A.; (2) Department of Biological Sciences, Louisiana State University, Baton Rouge, LA, U.S.A.

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762-P Bioinformatic and regulatory analysis of the *iac* gene cluster coding for bacterial biodegradation of IAA.
I. V. GREENHUT (1), N. N. Maharaj (1), J. C. Scott (2), J. H. J. Leveau (1); (1) University of California-Davis, Davis, CA, U.S.A.; (2) Oregon State University, Madras, OR, U.S.A.

763-P A functional gene cluster for toxoflavin biosynthesis in the genome of the soil bacterium *Pseudomonas protegens* Pf-5.
B. J. Philmus (1), B. T. Shaffer (2), Q. Yan (1), J. E. LOPER (3); (1) Oregon State University, Corvallis, OR, U.S.A.; (2) USDA-ARS, Corvallis, OR, U.S.A.; (3) USDA ARS, Corvallis, OR, U.S.A.

764-P Two potato cultivars display different responses to the infection by "Candidatus Liberibacter solanacearum".
J. LEVY (1), L. Cosme (1), A. Mendoza (1), J. C. Miller (1), C. Tamborindeguy (1), E. Pierson (1); (1) Texas A&M University, College Station, TX, U.S.A.

765-P Discovery and profiling of small RNAs responsive to stress conditions in the plant pathogen *Pectobacterium atrosepticum*.
L. N. MOLELEKI (1), S. Kwenda (1), V. Gorshkov (2), E. Rubagotti (1), P. Birch (3); (1) University of Pretoria, Pretoria, South Africa; (2) Kazan Institute of Biochemistry and Biophysics, Kazan Scientific Center, Russian Academy of Sciences, Kazan, Russia, Kazan, Russia; (3) The James Hutton Institute, Dundee, Scotland

766-P Using comparative genomics to identify new resistance sources against the tomato pathogens *Pseudomonas syringae* pv. *tomato* and *Ralstonia solanacearum*.
M. E. MECHAN LLONTOP (1), C. R. Clarke (1), C. L. Monteil (1), D. C. Haak (1), B. A. Vinatzer (1); (1) Virginia Tech, Blacksburg, VA, U.S.A.

767-P Genomic comparison of *Ralstonia solanacearum* strains which are pathogenic at low temperatures on tomato.
A. M. B. BOCSANCZY (1), J. C. Huguet-Tapia (2), D. J. Norman (3); (1) University of FLorida, Apopka, FL, U.S.A.; (2) University of Florida, Gainesville, FL, U.S.A.; (3) University of Florida, Apopka, FL, U.S.A.

768-P Analysis of *FST1* mutant of *Fusarium verticillioides* reveals global impact on transcriptome.
C. NIU (1), C. P. Woloshuk (2), G. A. Payne (3); (1) Purdue Univ, West Lafayette, IN, U.S.A.; (2) Purdue University, West Lafayette, IN, U.S.A.; (3) North Carolina State University, Raleigh, NC, U.S.A.

769-P PiAF, a Predicted Protein-Protein Interactome of *Aspergillus flavus*.
A. SUBEDI (1), B. M. Musungu (2), M. Geisler (2), R. L. Brown (3), D. Bhatnagar (3), A. M. Fakhoury (1); (1) Department of Plant, Soil and Agriculture Systems, Southern Illinois University, Carbondale, IL, U.S.A.; (2) Department of Plant Biology, Southern Illinois University, Carbondale, IL, U.S.A.; (3) Southern Regional Research Center, USDA-ARS, New Orleans, LA, U.S.A.

770-P Proteomic and metabolic analysis of clubroot resistance mediated by the resistance gene *Rcr1* from *Brassica rapa* ssp. *Chinensis*.
T. Song (1), R. LAHLALI (2), L. McGregor (1), K. A. Aliferis (3), S. Jabaji (3), F. Yu (1), G. Peng (1); (1) Agriculture and Agri-Food Canada, Saskatoon, SK, Canada; (2) Canadian Light Source Inc., Saskatoon, SK, Canada; (3) Department of Plant Science, Macdonald Campus of McGill University, Sainte-Anne-de-Bellevue, QC, Canada

771-P MoYAK1 protein kinase gene plays key roles in infection-related development and disease development in Magnaporthe oryzae.
K. S. KIM (1), J. Hur (1); (1) Kangwon National University, Chuncheon, Korea

772-P Molecular Mechanisms of Cercospora Pathogenicity Revealed Through Comparative Genomics.
A. Zaccaron (1), J. Ridenour (2), J. Smith (2), S. Sharma (2), N. Lawson (2), M. L. Zaccaron (2), A. Fakhoury (3), B. BLUHM (4); (1) University of Arkansas, Fayetteville , AR, U.S.A.; (2) University of Arkansas, Fayetteville, AR, U.S.A.; (3) Southern Illinois University, Carbondale, IL, U.S.A.; (4) Univ of Arkansas, Fayetteville, AR, U.S.A.

773-P Genome wide association study (GWAS) mapping identifies genomic regions associated with *Parastagonospora nodorum* virulence on wheat.
Y. GAO (1), J. Richards (1), R. S. Brueggeman (1), T. L. Friesen (2); (1) Department of Plant Pathology, North Dakota State University, Fargo, ND, U.S.A.; (2) Department of Plant Pathology, North Dakota State University; USDA-ARS, Norhern Crop Science Lab, Cereal Crops Research Unit, Fargo, ND, U.S.A.

774-P Exploring the *Penicillium expansum* genome for virulence genes mediating blue mold infection on pome fruits.
W. JURICK (1), J. Yu (2), V. L. Gasins (2), Y. Yan (3); (1) USDA ARS - Food Quality Laboratory, Beltsville, MD, U.S.A.; (2) UDSA-ARS, Beltsville, MD, U.S.A.; (3) Department of Biological Sciences, Northern Illinois University, Dekalb, IL, U.S.A.

775-P WITHDRAWN

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776-P Global transcriptional response to heat shock and grapevine wood in *Lasiodiplodia theobromae*.
M. PAOLINELLI-ALFONSO (1), J. M. Villalobos-Escobedo (2), J. F. Lopez-Hernandez (2), M. Rendon-Anaya (2), A. E. Herrera-Estrella (3), R. Hernandez-Matinez (4); (1) Centro de Investigacion CIentifica y Educacion Superior de Ensenada (CICESE), Ensenada, Mexico; (2) Laboratorio Nacional de Genomica para la Biodiversidad (LANGEBIO), Irapuato, Mexico; (3) Laboratorio Nacional de Genómica para la Biodiversidad (LANGEBIO), Irapuato, Mexico; (4) Centro de Investigacion Cientifica y Educacion Superior de Ensenada (CICESE), Ensenada, Mexico

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778-P The draft genome of *Sclerotinia minor*.
A. S. ESPINDOLA (1), W. L. Schneider (2), H. Melouk (1), S. Marek (1), C. D. Garzon (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) USDA ARS, Frederick, MD, U.S.A.

779-P Genome Dissection of pathogens that cause Fusarium wilt of Banana.
Y. ZHANG (1), C. Li (2), L. J. Ma (3); (1) University of Massachusetts Amherst, Amherst, MA, U.S.A.; (2) Guangdong Academy of Agricultural Science, Fruit Tree Research Institute, GUANGZHOU, China; (3) University of Massachusetts Amherst, AMHERST, MA, U.S.A.

780-P Whole-genome sequencing of *Botrytis paeoniae* using the Ion Proton platform for microsatellite discovery.
A. R. GARFINKEL (1), K. P. Coats (1), M. R. Wildung (2), G. A. Chastagner (1); (1) Washington State University, Puyallup, WA, U.S.A.; (2) Washington State University, Pullman, WA, U.S.A.

781-P Metagenome data mining for eukaryotic plant pathogens.
A. S. ESPINDOLA (1), W. L. Schneider (2), S. Marek (1), P. Hoyt (1), C. D. Garzon (1); (1) Oklahoma State University, Stillwater, OK, U.S.A.; (2) USDA ARS, Frederick, MD, U.S.A.

782-P Understanding pathogenesis of *Fusarium oxysporum* on *Arabidopsis thaliana* using comparative transcritptomics.
L. GUO (1), K. Vescio (1), P. Travers (1), L. J. Ma (1); (1) University of Massachusetts Amherst, Amherst, MA, U.S.A.

783-P Secretomics identifies *Verticillium dahliae* proteins involved in the interaction with cotton roots.
W. GUO (1), H. Xiao (2), J. Chen (2), X. Dai (2); (1) Institute of Agro-Products Processing Science & Technology, Chinese Academy of Agricultural Sciences, Beijing, China; (2) Institute of Agro-Products Processing Science & Technology, Chinese Academy of Agricultural Sciences, Beijing, China

784-P Polyketide synthase gene clusters in the swainsonine producing *Undifilum oxytropis*, fungal endophyte of the locoweed plant, *Oxytropis sericea*.
D. BAUCOM (1), D. Cook (2), C. Schardl (3), R. Creamer (4); (1) New Mexico State Univ, Las Cruces, NM, U.S.A.; (2) USDA, Logan, UT, U.S.A.; (3) University of Kentucky, Lexington, KY, U.S.A.; (4) New Mexico State University, Las Cruces, NM, U.S.A.

785-P Genomics study of limber pine genetic resistance to white pine blister rust.
J. J. LIU (1), A. W. Schoettle (2), R. A. Sniezko (3), N. Wang (4), A. Zamany (1), R. Sturrock (1), A. Kegley (3); (1) Pacific Forestry Centre, Canadian Forest Service, Natural Resources Canada, Victoria, BC, Canada; (2) USDA Forest Service, Rocky Mountain Research Station, Fort Collins, CO, U.S.A.; (3) USDA Forest Service, Dorena Genetic Resource Center, Cottage Grove, OR, U.S.A.; (4) Academy of Agriculture and Forestry Science, Qinghai University, Xining, China

786-P Mapping the mitochondrial genomes of seven anastomosis groups of *Rhizoctonia solani*.
R. Verma (1), D. LAKSHMAN (2), D. Roberts (3), I. Misner (4), N. Alkharouf (5), A. Pain (6); (1) USDA-ARS, FNPRU, Beltsville, MD, U.S.A.; (2) USDA ARS, FNPRU, Beltsville, MD, U.S.A.; (3) USDA-ARS, SASL, Beltsville, MD, U.S.A.; (4) University of Maryland, College Park, College Park, MD, U.S.A.; (5) Towson University, Towson, MD, U.S.A.; (6) King Abdullah University of Science and Technology, Thuwal, Saudi Arabia

787-P Draft Genome Sequence of the Plant-Pathogenic Fungus *Stemphylium lycopersici* Strain CIDEFI-216.
M. E. Franco (1), S. Lopez (2), R. Medina (3), M. C. Saparrat (4), P. BALATTI (5); (1) Centro de Investigaciones de Fitopatología Facultad de Ciencias Agrarias y Forestales Universidad Nacional de La Plata, La Plata, Argentina; (2) Instituto de Fisiología Vegetal (INFIVE), UNLP-CONICET. La Plata, Buenos Aires, Argentina., La Plata, Argentina; (3) Centro de Investigación y Desarrollo en Fermentaciones Industriales (CINDEFI), UNLP-CONICET. La Plata, Buenos Aires, Argentina, La Plata, Argentina; (4) Instituto Carlos Spegazzini, Facultad de Ciencias Naturales y Museo. La Plata, Buenos Aires, Argentina, La Plata, Argentina; (5) Univ Nacl de la Plata, La Plata, Argentina

788-P Characterization and comparative analysis of disease resistance genes from the genomes of rosaceous species using the RosaR80 framework.
L. VAN ECK (1), J. M. Bradeen (1); (1) University of Minnesota, St Paul, MN, U.S.A.

789-P Dissecting the molecular basis of basil-*Peronospora belbahrii* interactions.
D. Wu (1), J. Win (2), D. Shao (1), M. TIAN (1); (1) University of Hawaii at Manoa, Honolulu, HI, U.S.A.; (2) The Sainsbury Laboratory, Norwich, United Kingdom

790-P qRT-PCR as a tool for regulatory network reconstruction in *Phytophthora infestans*.
J. C. Castro (1), I. Valdés (2), G. Danies (3), L. N. Gonzalez (1), S. Cañas (4), C. E (5), S. RESTREPO (6), D. M. Riaño-Pachón (7); (1) Universidad de los Andes, Bogotá, Colombia; (2) Utrecht University, Utrecht, Netherlands; (3) Cornell University, Ithaca, NY, U.S.A.; (4) Harvard University, Cambridge, MA, U.S.A.; (5) Universidad Nacional de Colombia, Bogotá, Colombia; (6) Universidad de los Andes, Bogota, Colombia; (7) Laboratório Nacional de Ciência e Tecnologia do Bioetanol (CTBE), Campinas, Brazil, São Paulo, Brazil

791-P Metabolic and nutritional strategies of oomycete plant pathogens.
H. JUDELSON (1), M. Kagda (2), M. Abrahamian (2), A. Ah Fong (2); (1) Univ of California, Riverside, CA, U.S.A.; (2) University of California, Riverside, CA, U.S.A.

792-P Changes in the population structure of PVY during systemic movement in a potato plant.
W. L. DA SILVA (1), S. M. Gray (2); (1) Cornell University, Ithaca, NY, U.S.A.; (2) USDA-Agricultural Research Service; Department of Plant Pathology and Plant-Microbe Biology, Cornell University, Ithaca, NY, U.S.A.

793-P Temporally altered gene expression in *Bemisia tabaci* during feeding on tomato infected with the semipersistent *Tomato chlorosis virus*.
N. KAUR (1), W. Chen (2), Y. Zheng (2), Z. Fei (2), W. M. Wintermantel (1); (1) USDA ARS, Salinas, CA, U.S.A.; (2) Boyce Thompson Institute, Ithaca, NY, U.S.A.

Networking

794-P EMPHASIS, a European-funded project to provide integrated solutions for the effective management of pests and harmful alien species.
M. L. GULLINO (1), M. L. Gullino (2); (1) University of Torino, Agroinnova, DISAFA, Grugliasco Torino, Italy; (2) University of Torino, Agroinnova, DISAFA, Grugliasco, Italy

795-P Integrated Pest Information Platform for Extension and Education (iPiPE): A new USDA Cooperative Agricultural Program (CAP).
S. A. ISARD (1), F. Louws (2); (1) Penn State Univ, University Park, PA, U.S.A.; (2) North Carolina State University, Raleigh, NC, U.S.A.

Outreach and Engagement

796-P New prospects, progress, and research at the Fungal Genetics Stock Center.
K. MCCLUSKEY (1), J. F. Leslie (1); (1) Kansas State University, Manhattan, KS, U.S.A.

797-P Delivering site-specific applications to farmers in a knowledge network via cloud integration of weather mesonets and proven predictive models.
J. CARROLL (1), P. Oudemans (2), D. Cooley (3), J. Clements (4), D. Robinson (5), T. Bradshaw (6), R. Crassweller (7), M. Concklin (8), K. Peter (9), A. DeGaetano (10); (1) Cornell University, Geneva, NY, U.S.A.; (2) Rutgers The State University of New Jersey, Chatsworth, NJ, U.S.A.; (3) University of Massachusetts, Amherst, MA, U.S.A.; (4) University of Massachusetts, Belchertown, MA, U.S.A.; (5) Rutgers The State University of New Jersey, Piscataway, NJ, U.S.A.; (6) University of Vermont, Burlington, VT, U.S.A.; (7) Pennsylvania State University, University Park, PA, U.S.A.; (8) University of Connecticut, Storrs, CT, U.S.A.; (9) Pennsylvania State University, Biglerville, PA, U.S.A.; (10) Cornell University, Ithaca, NY, U.S.A.

798-P Undergraduate Research as a Bridge for College of Agricultural Sciences and Natural Resources Recruiting.
K. GWINN (1), J. Logan (2), A. Vanderpool (3), S. J. Domingo (2), C. A. Beyl (2); (1) Univ of Tennessee, Knoxville, TN, U.S.A.; (2) University of Tennessee, Knoxville, TN, U.S.A.; (3) Lincoln Memorial University, Harrogate, TN, U.S.A.

799-P Vectoring Plant Pathology: Outreach Group Brings Scientific Research from the Laboratory to the Classroom.
E. Lookabaugh (1), A. KOEHLER (1), K. McCorkle (1); (1) North Carolina State University, Raleigh, NC, U.S.A.

800-P Plant Pathology Career and Internship Opportunities at Monsanto.
S. ROSENBERGER (1); (1) Monsanto Vegetable Seeds, Woodland, CA, U.S.A.

801-P The Role of Science in Regulatory Decision Making: Pesticides and Honeybee Health.
D. OUIMETTE (1), J. Fajardo (2), P. Lewis (3), K. Eversole (4); (1) Dow AgroSciences LLC, Indianapolis, IN, U.S.A.; (2) USDA, Washington, DC, U.S.A.; (3) EPA, Washington, DC, U.S.A.; (4) Eversole Associates, Bethesda, MD, U.S.A.

Professional Development

802-P Creation and Implementation of STAR-D; a Laboratory Accreditation Program for the National Plant Diagnostic Network (NPDN) Laboratories.
K. SNOVER-CLIFT (1), D. Dailey O'Brien (1), P. Shiel (2), K. Burch (2), G. Dennis (2); (1) Cornell University, Ithaca, NY, U.S.A.; (2) USDA-APHIS-PPQ-CPHST, Raleigh, NC, U.S.A.

Teaching and Learning

803-P Applications of Mobile Microscopy in Plant Pathology.
A. L. TESTEN (1), S. A. Miller (1); (1) The Ohio State University OARDC, Wooster, OH, U.S.A.

804-P LSU Summer Technical Sharing Sessions: Graduate Students Teaching Graduate Students.
J. PENG (1), R. R. Sweany (1), A. Lunos (1); (1) Louisiana State University Agricultural Center, Baton Rouge, LA, U.S.A.

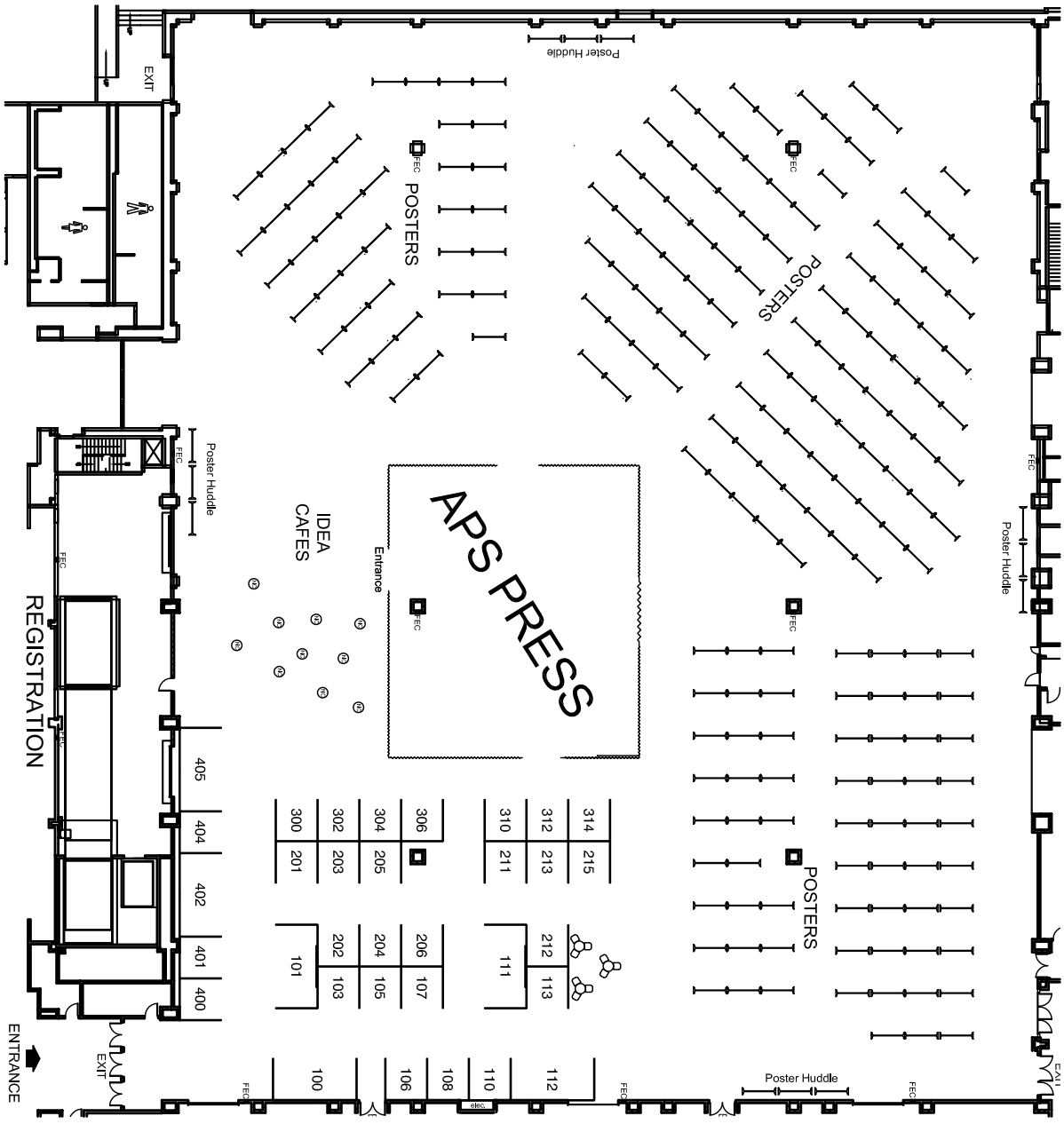
805-P Using rapid-cycling *Brassica* species and *Albugo candida* to teach concepts of plant disease resistance.
M. HAYSLETT (1), V. Kartanos (2), D. I. Rouse (3), P. Williams (2); (1) Univ of Wisconsin, Madison, WI, U.S.A.; (2) University of Wisconsin, Madison, WI, U.S.A.; (3) University of Wisconsin-Madison, Madison, WI, U.S.A.

806-P Plant Virus Biology for Advancing STEM Teaching.
B. Grimberg (1), C. I. POL (1), K. Ehlert (1), F. Menalled (1); (1) Montana State University, Bozeman, MT, U.S.A.

807-P Developing and testing an undergraduate level case study on cassava viral diseases.
S. Yusuf (1), S. MALLOWA (2), S. Ruongo (3), G. Abucheli (4), N. Korir (5), D. W. Miano (6), J. P. Legg (7), A. E. Robertson (8); (1) Makerere University, Kampala, Uganda; (2) Iowa State Univ, Ames, IA, U.S.A.; (3) Independent communications consultant, Bondo, Kenya; (4) Chuka University, Meru, Kenya; (5) Kenyatta University, Nairobi, Kenya; (6) University of Nairobi, College of Agriculture and Veterinary Sciences, Department of Plant Sciences and Crop Protection, Kangemi, Nairobi, Kenya; (7) International Institute of Tropical Agriculture, Dar es Salaam, Tanzania; (8) Iowa State University, Ames, IA, 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 18, 2015. Visit www.apsnet.org/meet for updates. Floor plan can also be found on the mobile app.



Exhibitor list in numerical order of assigned booth numbers.

100 DuPont Crop Protection
101 Agdia, Inc.
103 BioChambers Incorporated
105 MO BIO Laboratories, Inc.
106 CABI Books
107 Pro-Lab Diagnostics
108 UNL Doctor of Plant Health Program
110 Biopesticide Industry Alliance (BPIA)
111 USDA-APHIS-BRS
112 Alcorn State University
113 ADAMA
201 Dino-Lite Scopes (Big C)
202 Proptera, LCC
203 Novogene Bioinformatics Technology Co., Ltd. China
204 American Peat Technology (APT)
205 OptiGene
206 Sunburst Plant Disease Clinic, Inc.
211 Dow AgroSciences LLC
212 APS Public Policy Board (PPB)
213 APS Office of Public Relations and Outreach (OPRO)
215 2016 APS Annual Meeting - Tampa
300 BIOREBA AG/Eurofins
302 Taiwan HiPoint Corporation
304 The British Society for Plant Pathology
306 Spectrum Technologies, Inc.
310 AC Diagnostics, Inc.
312 PathSensors, Inc.
314 Conviron
400 Gylling Data Management
401 Percival Scientific Inc.
402 Springer
404 APS Diagnostics Committee
405 PhytoTechnology Laboratories

APS Meeting Exhibitors

Exhibitors are listed as of June 18, 2015. Floor plan can also be found on the meeting mobile app. THANK YOU to all our 2015 exhibitors for being part of this meeting! Exhibitor list in alphabetical order with descriptions.

Booth #310 **AC Diagnostics, Inc.** • ***Sustaining Associate***
1131 West 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 or www.nanodiainc.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 for our customers worldwide.

Booth #112 **Alcorn State University**
Department of Agriculture, 1000 ASU Drive #750, Alcorn State, MS 39096
Phone: +1.601.877.6527; Fax: +1.601.877.6219;
E-mail: dcollins1@alcorn.edu
Web: www.alcorn.edu/academics/schools/AREAS/
Located in Lorman, Mississippi, the oldest black land-grant institution in the United States, Alcorn State University founded in 1871 proudly exhibits a pictorial and oral history of African-Americans in Plant Pathology as our nation celebrates the 125th year anniversary of the signing of the Second Morrill Act of 1890.

Booth #113 **ADAMA** • ***Sustaining Associate***
3120 Highwoods Blvd, Suite 100, Raleigh, NC 27604
Phone: +1.919.256.9300; Email: help@adama.com;
Web: www.adama.com
ADAMA Agricultural Solutions Ltd (formerly Makhteshim Agan Industries) is a leading global manufacturer of crop protection solutions. With a comprehensive range of high-quality, differential and effective products, ADAMA strives to provide accessible, easy-to-use solutions that simplify the user experience while improving crop yields.

Booth #101 **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 #204 **American Peat Technology (APT)**
36203 350th Avenue, Aitkin, MN 56413
Phone: +1.218.927.1888; Fax: +1.218.927.3272
E-mail: info@americanpeattech.com;
Web: www.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 #215 **2016 APS Annual Meeting - Tampa, Florida**
3340 Pilot Knob Road, St. Paul, MN 55121
Phone: +1.651.454.7250; Fax: +1.651.454.0766
Web: www.apsnet.org/meet
APS takes the 2016 meeting to Tampa and the Tampa Convention Center. Stop by and check out this new and fun location.

Booth #404 **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 #213 **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 #212 **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 advocacy target – the "Phytobiomes Initiative" – and how you can become involved!

Booth #103 **BioChambers Incorporated** • ***Sustaining Associate***
477 Jarvis Avenue, Winnipeg, Manitoba R2W 3A8 Canada
Phone: +1.204.489.8900; 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 research needs.

Booth #110 **Biopesticide Industry Alliance (BPIA)**
PO Box 465, McFarland, WI 53558
Phone: +1.608.712.4916;
Web: www.biopesticideindustryalliance.org
BPIA is dedicated to fostering adoption of biopesticide technology through increased awareness about their effectiveness and full range of benefits to a progressive pest management program.

Booth #300 **BIOREBA AG/Eurofins** • ***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/sta-laboratories/bioreba-ag/
Eurofins STA Laboratories and BIOREBA AG are partners in providing agrodiagnostic products and services for results you can trust. Eurofins STA Laboratories, a leading independent diagnostic laboratory, is the exclusive distributor of BIOREBA products in the United States. Eurofins STA 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 #304 **The British Society for Plant Pathology**
Charles Darwin House, 12 Roger Street, London WC1N 2JU, United Kingdom
Phone: +44.20.7685.2550
E-mail: secretary@bspp.org.uk;
Web: www.bspp.org.uk
BSPP promotes the study and advancement of all branches of plant pathology. We support plant pathologists' interests worldwide and provide information and communicate with members via newsletter, website, and annual meeting. We edit three international journals and fund members for travel expenses and for short-term undergraduate and masters studentships.

Booth #106 **CABI Books**
22883 Quicksilver Drive, Sterling, VA 20166
Phone: +1.703.661.1581 or +1.800.232.0223;
Fax: +1.703.661.1501
E-mail: stylusmail@presswarehouse.com;
Web: www.styluspub.com
CABI is a not-for-profit international organization that improves people's lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. Our mission and direction is influenced by our member countries who help guide the activities we undertake.

Booth #314 **Conviron** • ***Sustaining Associate***
590 Berry Street, Winnipeg, Manitoba R3H 0R9, Canada
Phone: +1.204.786.6451; 800.363.6451;
Fax: +1.204.786.7736
Email: info@conviron.com;
Web: www.conviron.com
From small reach-in chambers, to large walk-in rooms, the Conviron Growth House, the Conviron Research Greenhouse, and customized designs, Conviron-controlled environments can be found in small start-up facilities to many of the world's largest and most prestigious universities and research facilities in more than 90 countries.

Booth #201 **Dino-Lite Scopes (Big C)**
20655 South Western Avenue, Suite 116, Torrance, CA 90501
Phone: +1.310.618.9490; Fax: +1.877.978.2787
E-mail: sales@bigc.com; Web: www.dinolite.us
Dino-Lite portable digital microscopes and eyepiece cameras provide high-quality microscopy video interfacing to PC and MAC. Most models provide 10x – 200x magnification with features such as measurement and adjustable polarizer. The included DinoCapture software makes it easy to take snapshots, record videos, manipulate images, and save and e-mail discoveries.

Booth #211 **Dow AgroSciences LLC** • ***Sustaining Associate***
9330 Zionsville Road, Indianapolis, IN 46268
Phone: +1.317.337.3000; Web: www.dowagro.com
We are committed to increasing crop productivity through higher yields, better varieties, and targeted pest management. Our products and services are designed to solve pressing crop production problems for our customers, boosting agriculture productivity to maximum sustainable levels to keep pace with the growing needs of our world's expanding population.

Booth #100 **DuPont Crop Protection** • ***Sustaining Associate***
974 Centre Road, Chestnut Run Plaza, Wilmington, DE 19805
Phone: +1.229.563.4326; Web: www.dupont.com/production_agricultural/en_us
For more than 200 years, DuPont has brought world-class science to the global agricultural marketplace through innovative products, materials, and services.

Booth #400 **Gylling Data Management** • ***Sustaining Associate***
405 Martin Boulevard, Brookings, SD 57006
Phone: +1.605.692.4021; Fax: +1.605.693.4180
E-mail: gdm.arm.support@gdmdata.com; Web: www.gdmdata.com
Providing research management 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, and record trial GPS locations. ST: summarize and report a trial series across locations and/or years; links with Trial Database to select trials based on information in any trial data entry field.

Booth #105 **MO BIO Laboratories, Inc.**
2746 Loker Avenue West, Carlsbad, CA 92010
Phone: +1.760.929.9911;
E-mail: customercare@mobio.com
Web: www.mobio.com
MO BIO Laboratories, Inc. is a global leader in solutions for nucleic acid purification, offering innovative tools for research in molecular biology. MO BIO's line of soil, plant, and microbial isolation kits are now the method of choice among environmental and microbiology researchers studying microbial DNA and RNA.

Booth #203 **Novogene Bioinformatics Technology Co., Ltd. China**
17F&21F, Tower B, Jinma Building, #38 Xueqing Road, Haidian District, Beijing, China
Phone: +86.10.82837567; Fax: +86.10.82837867
E-mail: support@novogene.com
Web: www.novogene.com/
Novogene Bioinformatics provides advanced genomic solutions.

Booth #205 **OptiGene** • ***Sustaining Associate***
5 Blatchford Road, HorshamWest Sussex RH13 5QR, United Kingdom
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 #312 **PathSensors, Inc.**
800 West Baltimore Street, Suite 405, Baltimore, MD 21201
Phone: +1.443.557.6150; Fax: +1.443.817.0830
E-mail: fmiller@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 #401 **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
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Booth #405 **PhytoTechnology Laboratories**
9245 Flint Street, Overland Park, KS 66214
Phone: +1.913.341.5343; Fax: +1.913.341.5442
Email: marketing@phytotechlab.com;
Web: www.phytotechlab.com
PhytoTechnology Laboratories® is a leading global supplier of plant tissue culture media, microbiological/phytopathology media, biochemicals, laboratory equipment and supplies for the plant science markets. We are an ISO-9001 certified company that provides unmatched quality and service. Visit our booth for more details and information about our products and company.

Booth #107 **Pro-Lab Diagnostics**
21 Cypress Boulevard, #1070, Round Rock, TX 78665
Phone: +1.512.832.9145; E-mail: kristy@pro-lab.us
Web: www.pro-lab-direct.com
Originally established in 1974, the Pro-Lab Group of companies is dedicated to providing high-quality, cost-effective immunodiagnostic and molecular products. Pro-Lab distributes, as well as manufactures, products for medical and research facilities. Visit our booth to learn more about the citrus greening and other Pro-AmpRT™ rapid isothermal molecular assays.

Booth #202 **Proptera, LLC** • ***Sustaining Associate***
106A Industrial Drive, Waxahachie, TX 75165
Phone: +1.972.937.9595; Web: www.proptera.com
Proptera, LLC markets and sells Zonix Biofungicide made with rhamnolipids. Rhamnolipids have been found highly effective for the control of oomycetes in organic agriculture and when used in rotation with conventional pesticides to reduce resistance. Their powerful surfactant properties also provide the grower added benefits when used in tank mixes.

Booth #306 **Spectrum Technologies, Inc.**
3600 Thayer Court, Aurora, IL 60504
Phone: +1.800.248.8873;
E-mail: bbozarth@specmeters.com
Web: www.specmeters.com
Spectrum Technologies, Inc. offers affordable devices to measure nutrient levels, soil qualities, light, weather, and other factors affecting plant growth. Our WatchDog weather stations and data loggers make it easy to record weather events and conditions. Over 15,000 customers count on Spectrum's easy-to-use, dependable technology for their growing needs.

Booth #402 **Springer**
233 Spring Street, New York, NY 10013
Phone: +1.212.460.1600;
E-mail: exhibits-ny@springer.com
Web: www.springer.com
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Booth #206 **Sunburst Plant Disease Clinic, Inc.**
677 East Olive, Turlock, CA 95380
Phone: +1.209.667.4442; Fax: +1.209.667.4443
E-mail: slivingston@sunburstpdcinc.com;
Web: www.sunburstpdcinc.com
Sunburst Plant Disease Clinic offers plant disease diagnostic services using NSHS and AOSA Protocols. Certified by CDFA and USDA for disease diagnosis. Diagnostic test for HLB and PCR; detection of viral infection using ELISA; detection and determination of soil bacterial and fungi and microbial activity analysis of soil.

Booth #302 **Taiwan HiPoint Corporation** • ***Sustaining Associate***
No. 3, South 7th Road, K.E.P.Z, Kaohsiung 806, Taiwan
Phone: +886.7.8128885; Fax: +886.7.8128336
E-mail: sales02@twhipoint.com;
Web: www.twhipoint.com
Taiwan HiPoint manufactures astonishing lab equipment to support the scientist's daily life. Our growth chamber, chillers, shaking incubators, LED, and spectrometer have been leading the Taiwanese market for 30 years.

Booth #108 **UNL Doctor of Plant Health Program**
279E Plant Sciences Hall, PO Box 830933, Lincoln, NE 88583-0933
Phone: +1.402.472.3365 or +1.402.472.3345;
Fax: +1.402.472.3300
E-mail: dph@unl.edu; Web: www.dph.unl.edu
The Doctor of Plant Health Program at the University of Nebraska–Lincoln (DPH) degree is a doctoral-level professional degree designed to educate plant practitioners with broad expertise and experience across all disciplines that impact plant health and plant management. Internships focus on application of this comprehensive background in production systems.

Booth #111 **USDA-APHIS–BRS**
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. Biotechnology Regulatory Services regulates certain genetically engineered organisms by, among other things, evaluating their potential plant pest risks.

CONGRATULATIONS TO THE 2015 APS FOUNDATION AWARDEES

The following 75 individuals received awards and a total of $45,800 from the APS Foundation in 2015. Special thanks to all of the donors and volunteers whose continued support makes these opportunities possible. Join us in honoring these individuals at the Opening General Session on Sunday morning, and be sure to stop by the APS Foundation's booth located near registration to create new possibilities for future leaders in plant pathology.

Books for the World Award
Muhammad Ibrahim Khaskheli and Faheem Uddin Rajer, Sindh Agriculture University
Tsitsi Nyamupingidza, Chinhoyi University of Technology
Olanrewaju Folusho Olotuah, Adekunle Ajasin University

Browning Plant Medicine and Health Travel Award
Rebecca Barocco, University of Florida

French-Monar Latin American Award
Paola Alejandra Picos-Muñoz, Centro de Investigación en Alimentación y Desarrollo

Lucy Hastings de Gutiérrez Award for Excellence in Teaching
Michael G. Milgroom, Cornell University
Eric B. Nelson, Cornell University

Frank L. Howard Undergraduate Fellowship
Jared Mohr, Cornell University

International Travel Award
Abdul Rehman, University of Agriculture Faisalabad

JANE International Research Award
Erica M. Goss, University of Florida

JANE International Service Award
Rebecca J. Nelson, Cornell University

Noel T. Keen Award for Research Excellence in Molecular Plant Pathology
Thomas J. Baum, Iowa State University

Don and Judy Mathre Education Endowment Award
Members of the **North Carolina State University Plant Pathology Outreach Team,** including: **Alyssa Koehler, Emma Lookabaugh, Kestrel L. McCorkle, Lucky Mehra, Roslyn Noar, Megan L. Sexton, William C. Sharpee, Anna Thomas, and Emma C. Wallace**

Don and Judy Mathre Student Educational Award
Manisha Rath, USDA & University of Georgia

15th I. E. Melhus Graduate Student Symposium
Kiersten A. Bekoscke, Cornell University
Robin Choudhury, University of California, Davis
Zachariah R. Hansen, Cornell University
André Aguiar Schwanck, Institut National de la Recherche Agronomique
Stephen Wyka, University of New Hampshire

Plant Pathology Experiential Award - Department
Members of the **Louisiana State University Plant Pathology and Crop Physiology Graduate Student Association,** including: **Sebastian Albu, Adam Bigott, Eduardo Chagas, Dongfang Hu, Allysson Lunos, Jingyu Peng, Yenjit Raruang, Josielle Rezende, and Rebecca Sweany**

Plant Pathology Experiential Award - Individual
Jade Florence, Oregon State University

Schroth Faces of the Future Early Career Professionals Symposium
J. Alfonso Cabrera, Bayer CropScience
Shiyan Chen, Cornell University
Travis R. Faske, University of Arkansas
Paulo Vieira, USDA & Virginia Tech

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Percival Scientific, Inc.
PropTera, LLC
Sakata Seed America, Inc.
Spectrum Technologies, Inc.
Syngenta Crop Protection
Valent USA Corporation

Interested in becoming an APS Sustaining Associate Member?

Please visit the registration desk or apsnet.org/about/join/benefits/Pages/SA.aspx for more information.

Recognition

2015 APS Author Index

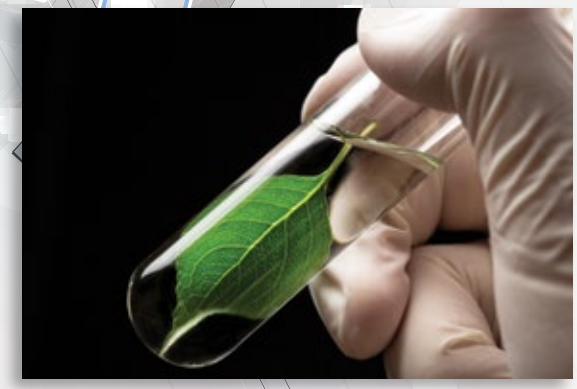
NOTES

APS Annual Meeting

2016

July 30–August 3

Tampa, Florida



Science to Practice

Special Sessions – Field Trips – Workshops
Submissions Accepted: July 8 – August 25, 2015

Oral Technical Sessions
Submissions Accepted: February 1– March 15, 2016

The American Phytopathological Society

NEW!

Potyvirus ImmunoStrip®

Detect **multiple viruses** in **minutes**

- Test-on-site
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- Fast results
- No experience required

Available in kits of 5 and 25.
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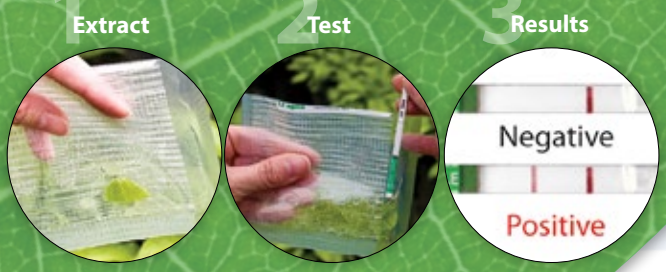

Visit us at Booth # 200/101 for special savings on the Poty ImmunoStrip!

AmplifyRP® Discovery Kits

- ✓ Design your own plant pathogen assays
- ✓ Easy / Crude sample preparation
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- ✓ Portable
- ✓ Extraction to results in about 30 minutes

Endless Possibilities for Nucleic Acid Detection

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End-point detection

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