

Bacterial wilt and canker of tomato

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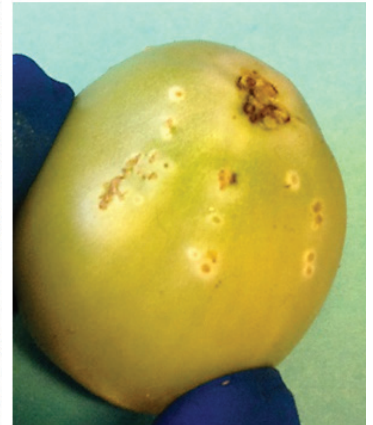
Bacterial wilt and canker is an important tomato disease caused by the bacterial pathogen *Clavibacter michiganensis* subsp. *michiganensis*. Bacterial canker can cause substantial losses in greenhouse and field production systems. The economic threat and the challenges to manage this disease have led to the inclusion of this pathogen as a quarantine agent in Europe, Asia, Africa, and the Caribbean. At present, control and management of this disease relies primarily on the use of clean seed, healthy transplant practices, and crop rotation.

Disease symptoms

In the greenhouse, the first symptom is unilateral wilting of leaflets followed by whole plant collapse. In the field, the edge of the leaflet desiccates mainly on lower leaves. The plant slowly desiccates, usually without exhibiting wilting symptoms. Brown stripes may appear on stems and petioles that split to expose yellowish to reddish-brown cavities, called stem cankers. Unilateral wilting of leaves, stem canker formation, and bird's eye spot lesions on the fruit surface are the classical diagnostic features of tomato bacterial canker.

Pathogen transmission

Clavibacter michiganensis subsp. *michiganensis* gains entry into the plant through contaminated seeds, wounds, broken hydathodes and then proliferates in xylem vessels. Primary infection of tomato plants originates from contaminated seed. The disease spreads to other seedlings and plants by practices such as clipping and packaging for transplant production, tying and staking of trellis tomatoes, suckering and tying in greenhouses, water splashing caused by rain, overhead irrigation and chemical sprays. In the field,



Bacterial wilt and canker of tomato (top, left); bird's eye lesions of fruit collected from infected plants in the field (top, right); unilateral wilting and stem cankers after Clavibacter michiganensis subsp. michiganensis infection in greenhouse (bottom left and right).

bacteria can spread from plants with primary infection to nearby plants by water splash and mechanical transmission.

Prevention and control

Use of healthy seeds is the first and most important condition for controlling and management of bacterial canker. Seed testing is an essential tool for the control

Issue highlights

- Survey link for tomato growers
- 6th International oomycetes workshop

of *C. michiganensis* subsp. *michiganensis* and is important for its regulation and control through phytosanitary certification and quarantine programs in the domestic and international seed trade. Tomato seed testing is based on dilution plating of seed extracts on semi-selective media followed by PCR and pathogenicity tests. Gitta Coaker and colleagues at the University of California, Davis, are using genome sequences of many pathogenic and nonpathogenic *Clavibacter* strains to generate a highly specific multiplex PCR diagnostic assay.

Seed treatment, appropriate cultural practices, chemical sprays, hygiene and sanitation are other important

If you work with commercial tomato growers, please share this short survey on bacterial wilt and canker detection:

www.surveymonkey.com/r/2H8YT8B

measures for controlling the disease. Once the disease has appeared, strict hygiene measures such as eradication of infected plants and isolation of infected rows, destruction of crop residues, disinfection of structures and equipment can prevent further contamination. 🌿

Diagnostics

6th International Oomycetes Workshop to celebrate the 50th anniversary of the International Society of Plant Pathology at the ICPP 2018

Z. Gloria Abad, USDA-APHIS-PPQ-Center for Plant Health Science & Technology, CPHST Beltsville Laboratory

The Subject Matter Committee (SMC) of the Oomycetes of the International Society of Plant Pathology (ISPP) is very pleased to announce the presentation of the Satellite Meeting “6th International Workshop: *Phytophthora*, *Pythium*, Downy Mildews and related genera (Oomycetes in the era of Plant Health in A Global Economy)” that will be held Saturday, July 28, 2018 at the Hynes Convention Center, 900 Boylston St, Boston in Massachusetts, USA. This important event will be offered to salute and celebrate our science of Plant Pathology in the 50th anniversary of the International Society of Plant Pathology (ISPP) in the occasion of the 11th International Congress of Plant Pathology (ICPP) 2018 organized by the International Society of Plant Pathology (ISPP) and American Phytopathological Society (APS) in Boston, USA during July 29–August 3.

The **SMC of the Oomycetes** of the ISPP was established in December 2016 and has 34 members from 15 countries including Argentina, Australia, Canada, Czech Republic, Germany, India, Italy, Japan, Mexico, Philippines, South Africa, Spain, Taiwan, United Kingdom and United States. **Gloria Abad** (USA) is the Chair and **Marco Thines** (Germany), **Andre Levesque** (Canada), and **David Cooke** (UK) are co-Chairs. One of the missions of the SMCs of the

A workshop flyer is available to post or distribute. Click here to access this flyer or visit the ISPP website at www.isppweb.org/smc_io.asp.

ISPP is to organize international workshops. This event is supported by the Italian Phytopathological Society, Latin American Association of Phytopathology and the American Phytopathological Society-Caribbean Division (APS-CD) and by the American Phytopathological Society (APS) Committees of Diagnostics; Mycology; Plant Pathogen and Disease Detection; Regulatory Plant Pathology Committee and by the Office of International Programs. The workshop is organized by Gloria Abad (USA). Members of the scientific committee for the workshop are Gloria Abad (USA), Marco Thines (Germany), Andre Levesque (Canada), David Cooke (UK), **Guillaume Bilodeau** (Canada), **Palem Chowdappa** (India), **Santina Caciola** (Italy), **Hemilse Palmucci** and **Pablo Grijalba** (Argentina), **Chis Spies** (South

Africa), **John Bienapfl**, **JoAnne Crouch**, **Ronald French**, **Carla Garzon**, **Frank Martin**, **Lina Quesada**, and **Yazmin Rivera** (USA). Topics of the workshop will be taxonomy and nomenclature: past, present, and future; identification and diagnostics: from the traditional tools to the innovative genomic sequencing technologies (IGST) including NGS and TGS; diversity in cultivated and natural environments: the global spread of pathogens; management and control: advanced IPM-tools, improved biocontrol, enhancing resistance, sustainable production, agricultural systems for the future; plant pathogenic oomycetes of concern: trade regulations, advanced monitoring and certification; plant pathogenic oomycetes: the era of genomics and microbiomics; and new technologies for Oomycete research: looking to the future. The “IDphy: Molecular and Morphological Identification of *Phytophthora* Based on the Types” an online resource with Lucid Key, and Tabular Key that was developed by Gloria Abad and collaborators **Treena Burgess** (Australia), **John Bienapfl**, **Michael Coffey** and **Amanda Redford** (USA) to facilitate accurate and

robust identification of species using type specimens will be demonstrated to close the event.

This workshop will provide capacity building on identification and diagnostics, ecology, etiology, population genetics, advanced technologies; helping to build collaborative international and national scientific relations; serving as a catalyst for many to accurately describe new species in the oomycetes; learning about the emerging oomycetes of concern around the world; increasing the knowledge to develop molecular diagnostics tools; and obtaining information on the current status of identification of plant pathogenic oomycetes. Many oomycetes are recognized to be high risk plant pathogens causing high economic and environmental impact in different areas of the world. Authorities will be keynote speakers and contributions from oral and poster presentations are encouraged from participants. For registrations visit **ICPP Program** or contact Gloria Abad at gloria.abad@aphis.usda.gov. 🌿

committee Highlights

NPDN PROGRAM AREAS

National Database Committee

Cindy Music, Committee Chair, Purdue University

The NPDN National Database Committee held a conference call on February 21, 2018. The following agenda items were covered:

- Two pest codes proposed for the National Repository Pest Dictionary needing further review by the committee. a.) A Picloram injury request opened discussion on individual entries for specific herbicides bringing about data division resulting in many entries. Further discussion points are included in the minutes. b.) The naming convention of *Guignardia bidwellii* as a synonym versus the primary name of *Phyllosticta ampellicida*. Megan Romberg,

National Mycologist/Plant Pathologist for USDA-APHIS-PPQ-PHP-NIS, was an invited participant in this discussion. Megan explained that the Genus *Guignardia* is moribund and *Guignardia bidwellii* is a synonym to *Phyllosticta ampellicida*. ARS is in the process of reviewing this genus. Please see the minutes for further discussion.

- Additional National Repository Pest Dictionary matters include a.) The taxonomic review of the gastropod classification. b.) The taxonomic change of Acari from the rank of order to the rank of sub-class.
- Administrative matters included a.) The discussion and proposal to review both the mission statement

for the National Database Committee and the National Repository Upload Guidelines. b.) Requesting additional membership, with more representation from the western region and entomological membership.

The full minutes of this call are available on the NPDN website, National Database Committee page.

The next conference call has been set for March with an actual date and time to be polled. ❖

Visit www.npdn.org for more information on Program Area Committees. Login required.

Upcoming events

Meetings

July 29–August 3, 2018

International Congress of Plant Pathology
(ICPP) 2018

Boston, Massachusetts

August 12–16, 2018

National Plant Board 2018 Annual Meeting
Cleveland, Ohio

photo of the month

www.bugwood.org

downy mildew (*Peronospora parasitica*)

Downy mildew infection of cabbage caused by *Peronospora parasitica*
© Howard F. Schwartz, Colorado State University

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