PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

ISPP NEWSLETTER

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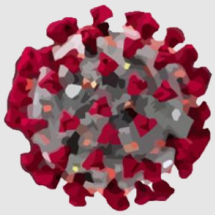
The International Society for Plant Pathology promotes the world-wide development of plant pathology and the dissemination of knowledge about plant diseases and plant health management

IN THIS ISSUE:

How is COVID-19 affecting plant pathologists?



In the fifth month of this series, I share my story on: "How is the COVID-19 pandemic impacting your research, teaching, outreach and lives? Share your stories with our ISPP community on how you and your family and colleagues are coping. Send a few lines through the online form to share in the ISPP Newsletters over the next few months!

Daniel Hüberli, Department of Primary Industries and Regional Development, Western Australia

Photo credit: Christiaan Valentine, DPIRD

As a plant pathologist, working primarily on soilborne fungal diseases of cereals in Western Australia, our work from home routine was enforced by the government for about a month in May 2020. Plans for experimental field trials for the growing season were just beginning and further approvals from our director to conduct trials were required. Borders between Australian states were closed, and remain closed indefinitely, which means that interstate meetings are not possible for the near future. We all have learned using online communication programs, like Zoom, to keep up to date with our collaborators across the borders. Within the state, our borders were also temporarily closed for several weeks, which meant applying for border passes and travelling through police check points to get from the Perth metropolitan head office where I am based to the regionally based field trials. Travel for me typically is 250-600 km in either a northen, eastern or southern direction, and often a plane is involved. With travel limited to day trips only, we were all forced to keep trials closer to home, about 200 km from home base. This is probably a good outcome as I have managed to keep a closer eye on my trials. We are all back at the office again, and many are now working from home a few days a week. Only just last week the Crop Protection group organised a virtual field day which will be put online for the state's cereal growers and their advisors to view. In the end, no trials were cancelled with all work going ahead.

Postponed conference due to COVID-19

In order to protect the health, safety and well-being of our international community from COVID-19 some conferences and workshops have been postponed or changed to virtual meetings. Affected meetings with cancellations or new dates, where confirmed, are listed here. These changes have also been updated in the Coming Events list. Please let me know of any date changes that I may have missed.

- 16th Congress of the Mediterranean Phytopathological Union, has been postponed to 20 -22 April, 2021.

MANAGING APPLE SCAB USING SEAFOOD INDUSTRY BYPRODUCT

LORI TYLER GULA, UNIVERSITY OF NEW HAMPSHIRE NEWS, 10 AUGUST 2020

University of New Hampshire (UNH) researchers have teamed up with colleagues from Pennsylvania State University to investigate whether a byproduct of the seafood industry could help manage one of the most devastating fruit diseases facing the US apple industry.

University of New Hampshire graduate student Liza DeGenring is investigating the development of new tools to manage apple scab for Northeast farmers (Photo credit: UNH).

UNH graduate student Liza DeGenring is investigating the development of new tools to manage apple scab for Northeast farmers. Specifically, she is investigating the combination of beneficial microbes with a natural compound called chitosan—a byproduct of mostly shrimp shells from the seafood industry.

Much of the research around chitosan has focused on the reduction of postharvest disease—once the fruit or vegetable has been harvested. Chitosan has shown to be effective in reducing plant disease and preserving fruits and vegetables during storage and transport. Researchers at UNH would like to extend this research to investigate the effect of a chitosan application during crop production and in combination with an application of biopesticides.

Apple scab, caused by the fungus Venturia inaequalis, is one of the most destructive diseases of apple worldwide. This disease is a significant threat to growers in the Northeastern US because of the warm, moist conditions during the growing season that favor disease development. Apple scab can cause up to 100 percent crop loss and significant reduction in fruit marketability. According to the USDA National Agricultural Statistics Service, the market value of apples nationwide was US$2.4 billion. The New Hampshire tree fruit industry includes 228 farms growing 1,701 acres of tree fruit, valued at $9.3 million.

According to DeGenring, the success of sustainable agriculture in the United States will increasingly rely on the integration of biologically based methods with conventional agricultural practices that rely on fungicides. The scientific and agricultural community has begun to recognize the critical role microorganisms, such as bacteria and fungi, and their metabolites play in agroecosystem health.

Read more.

ORGANIC AMENDMENTS FOR PATHOGEN AND NEMATODE CONTROL

A review by Erin Rosskopf *et al.* titled "Organic amendments for pathogen and nematode control" was published in August 2020 by *Annual Review of Phytopathology* (vol. 58, pp. 277-311). The abstract is as follows:-

The loss of methyl bromide as a soil fumigant and minimal advances in the development and registration of new chemical fumigants has resulted in a resurgence of interest in the application of organic amendments (OAs) for soilborne plant pathogen and plant-parasitic nematode management. Significant progress has been made in the characterization of OAs, application of strategies for their use, and elucidation of mechanisms by which they suppress soilborne pests. Nonetheless, their utility is limited by the variability of disease control, expense, and the logistics of introducing them into crop production systems. Recent advances in molecular techniques have led to significant progress in the elucidation of the role of bacteria and fungi and their metabolic products on disease suppression with the addition of OAs. Biosolarization and anaerobic soil disinfestation, developed to manipulate systems and favor beneficial microorganisms to maximize their impact on plant pathogens, are built on a strong historical research foundation in OAs and the physical, chemical, and biological characteristics of disease-suppressive soils. This review focuses on recent applications of OAs and their potential for the management of soilborne plant pathogens and plant-parasitic nematodes, with emphasis primarily on annual fruit and vegetable production systems.

Read paper.

MODELING THE IMPACT OF CROP DISEASES ON GLOBAL FOOD SECURITY

A review by Serge Savary and Laetitia Willocquet titled "Modeling the impact of crop diseases on global food security" was published in August 2020 by *Annual Review of Phytopathology* (vol. 58, pp. 313-341). The abstract is as follows:-

Plant pathology must contribute to improving food security in a safe operating space, which is shrinking as a result of declining natural resources, climate change, and the growing world population. This review analyzes the position of plant pathology in a nexus of relationships, which is mapped and where the coupled dynamics of crop growth, disease, and yield losses are modeled. We derive a hierarchy of pathogens, whereby pathogens reducing radiation interception (RI), radiation use efficiency (RUE), and harvest index increasingly impact crop yields in the approximate proportions: 1:4.5:4,700. Since the dawn of agriculture, plant breeding has targeted the harvest index as a main objective for domesticated plants. Surprisingly, the literature suggests that pathogens that reduce yields by directly damaging harvestable plant tissues have received much less attention than those that reduce RI or RUE. Ecological disease management needs to target diverse production situations and therefore must consider variation in attainable yields; this can be achieved through the reengineering of agrosystems to incorporate built-in dynamic diversity of genes, plants, and crop stands.

Read paper.

NEW SCIENCE INITIATIVE TO TACKLE BACTERIAL PLANT THREATS IN UK

HORTDAILY, 25 AUGUST 2020

A new initiative on bacterial plant diseases has just begun with support from the UK Research and Innovation Strategic Priorities Fund and specifically funded by UK Research Innovation (UKRI)- Biotechnology and Biological Sciences Research Council, UKRI – Natural Environment Research Council, Department for Environment, Food and Rural Affairs (DEFRA), and the Scottish Government. This was driven both by the emergence of bacterial plant diseases and by concern about loss of a critical skill base across UK science in the field of bacterial plant pathology. Gone unchecked, a decline in this science base could leave agricultural, horticultural and forestry sectors vulnerable to hard-to-control endemic and invasive bacterial plant pathogens, which are notoriously difficult to control at the best of times.

This initiative, representing an investment of nearly £13 million over the next 3 years, involves eight new research projects across the UK. These new projects build on the recently established BRIGIT project which for the past two years has been tackling the threat posed by the broad host range bacterial pathogen *Xylella fastidiosa* – arguably one of the biggest and most destructive bacterial diseases threatening the UK. Five of the eight new projects target important pathogens that cause significant losses or pose a threat to UK agricultural and horticultural cropping systems, including *Pectobacterium*, *Ralstonia*, *Xanthomonas*, *Liberibacter* and *Rhizobium radiobacter* encompassing crop hosts such as potato, tomato, carrot, brassicas and strawberry. Another project aims to understand how bacterial populations that reside on plant leaf surfaces affect resistance to bacterial canker (caused by *Pseudomonas syringae pathovars*) in cherry and a further two projects investigate bacterial associations of oak trees and whether their interactions with environmental factors influence the health of this iconic woodland species.

For more information: BPD-UK www.bacterialplantdiseases.uk

ACCESS ON-DEMAND PLANT HEALTH 2020 ONLINE CONTENT UNTIL 2021

While the live programming for Plant Health 2020 Online, an American Phytopathology Society (APS) meeting, has ended, you can still register until 14 September to get on-demand access to all of the leading plant pathology programming you missed. Premium tier registrants have access to all programming on demand until 14 September, while Unlimited tier registrants have access until 14 August, 2021. In addition, Unlimited tier registrants get free access to eight upcoming interactive workshops covering a variety of topics—from an introduction to root phenotyping to using spore trapping in research and disease forecasting. Learn more about Plant Health 2020 Online on-demand programming and register before 14 September.

GENOMES ON CANVAS: ARTIST'S PERSPECTIVE ON EVOLUTION OF PLANT-BASED FOODS

A paper by David Vergauwen and Ive De Smet titled "Genomes on canvas: Artist's perspective on evolution of plant-based foods" was published in August 2020 by *Trends in Plant Science* (vol. 25, pp. 717-719). The abstract is as follows:-

How can we trace the evolution of our plant-based food through time? Here, we will discuss the advantages and disadvantages of using historical paintings to map the history of modern fruits, vegetables, legumes, grains, nuts, and seeds, and explain how the general public can contribute to such studies.

Read paper.

Authors Ive De Smet and David Vergauwen in a field of wheat, one species that has been the focus of this type of research (Photo credit: Liesbeth Everaert).

An interesting read is also the article related to the paper on the Global Plant Council page.

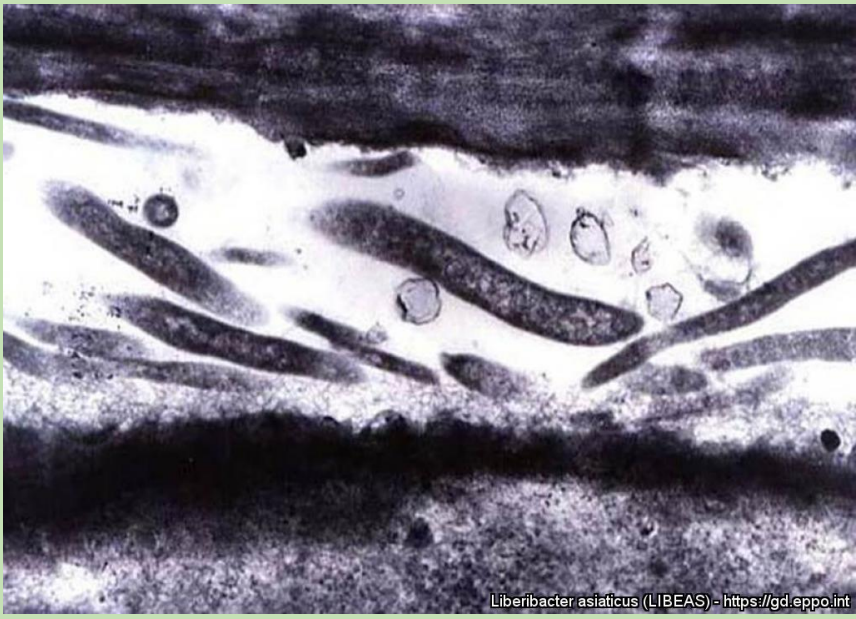
BACTERIAL ROAD MAP OFFERS NEW TARGETS FOR HUANGLONGBING DISEASE TREATMENTS

JULES BERNSTEIN, UC RIVERSIDE NEWS, 10 AUGUST 2020

Scientists are closer to gaining the upper hand on Huanglongbing disease that has wiped out citrus orchards across the globe. New models of the bacterium linked to the disease reveal control methods that were previously unavailable.

"They show you all the biological processes, and how they work together," said Univeristy of California (UC) Riverside microbiology professor James Borneman. "They also show you which molecular pathways, if blocked, will kill the organism."

In this case, researchers created the first models of the bacterium associated with Huanglongbing, also known as citrus greening disease. The team's work is described in a new paper published in Nature's *npj Systems Biology and Applications*.



Transmission electron microscope image of CLas bacterium (Photo credit: J.M. Bové/INRA).

The research team made models for six different strains of the bacterium known as CLas and doing so enabled them to identify as many as 94 enzymes essential for the bacterium's survival. These enzymes can now be considered targets for the creation of new antibacterial treatments.

In addition, the team identified metabolites required for the bacteria to grow.

Read more.

SOURCE OF PATHOGEN THAT CAUSES BITTER ROT DISEASE

AMY DUKE, PENN STATE NEWS, 13 AUGUST 2020

Fungal spores responsible for bitter rot disease, a common and devastating infection in fruit, do not encounter their host plants by chance. Turns out, they have a symbiotic association with the plant, often living inside its leaves.

The new way of looking at the fungal pathogen, *Colletotrichum fioriniae*, as a leaf endophyte — bacterial or fungal microorganisms that colonise healthy plant tissue — was the outcome of a two-year study conducted by researchers in Penn State's College of Agricultural Sciences.

According to Phillip Martin, a doctoral candidate in plant pathology, the findings, which were published recently in the journal *Phytopathology*, have important implications for the management of the pathogen in fruit trees.

Research conducted by scientists in Penn State's College of Agricultural Sciences focused on finding the source of bitter rot disease in fruit. Here, apples infected with *Colletotrichum fioriniae* show disease symptoms of sunken lesions and orange spore masses (Photo credit: J. Phillip Martin).

C. fioriniae causes diseases, often called anthracnoses, in more than 100 fruit and vegetable plants, including apple, peach, pear and strawberry. The fungus infects the fruit under warm and wet conditions and causes brown, sunken lesions; occasionally, orange spores will be seen on the surface.

"The research was based on the idea that if we can determine where the spores are coming from, then maybe we can eliminate the source and break the bitter rot disease cycle," said Martin, who carried out the study under the guidance of Kari Peter, associate research professor of tree-fruit pathology. "Unfortunately, from this perspective, many of the spores come from leaves, including apple leaves, and from trees and shrubs that are everywhere in Pennsylvania."

Previously, the spores in question were thought to originate mostly from diseased fruits and twigs. However, even when infected fruits and twigs were removed from a tree, the disease, while reduced, often still was present, a circumstance that puzzled scientists.

Read more.

AN INVENTORY PROVIDING INFORMATION ON MORE THAN 200 VIRUSES THAT INFECT PLANTS IN BRAZIL

MARIA FERNANDA ZIEGLER, AGÊNCIA FAPESP, 5 AUGUST 2020

Brazilian scientist has produced an inventory of 219 viruses and viroids that infect plants in Brazil, including many agriculturally important species. The annotated list, published in *Biota Neotropica*, is the largest compilation of information on plant viruses ever produced in Brazil. It presents descriptions of the microorganisms, data on the diseases they cause, and information on their occurrence in native, cultivated and ornamental plants as well as weeds.

Most of the viruses and viroids in the inventory are recognised by the International Committee on Taxonomy of Viruses (ICTV), which authorises and organises taxonomic classification and nomenclature. Some of the microorganisms listed have yet to be officially recognised. The list maps the history of pathogenic occurrences in Brazilian agriculture and the evolution of plant virology in Brazil as well as the main centers of research in the field.

For example, citrus tristeza virus (CTV) is one of the top 20 viruses in molecular plant pathology. It causes citrus plants to decline quickly and is the most economically important citrus disease worldwide, being responsible for enormous losses, including the destruction of some 10 million orange trees in the 1940s. This problem was solved on the basis of scientific research, and the state of São Paulo became the world's largest producer and exporter of industrialised orange juice.

Another important crop pest is bean golden mosaic virus, which emerged in the 1970s, when Brazil was one of the world's leading producers of beans but had to import the commodity from Mexico owing to the severe losses caused by the disease. Additionally, mosaic is caused in papaya by papaya ringspot virus (PRSV). This disease has wiped out entire plantations in Brazil. Control by roguing (systematic removal of diseased plants) has been sufficiently effective to enable the state of Espírito Santo, which pioneered the technique, to become a major exporter of papaya.

Read more.

CURRENT VACANCIES

No current vacancies.

ACKNOWLEDGEMENTS

Thanks to Grahame Jackson, Greg Johnson, and Jan Leach for contributions.

COMING EVENTS

International Seed Testing Association Seed Health Workshop: Seed health methods to detect fungi, bacteria and viruses
Postponed – date to be announced
Pretoria, South Africa
Website: www.seedtest.org/en/event-detail---0--0--0--111.html

13th Arab Congress of Plant Protection
1 November - 6 November, 2020
Le Royal Hotel, Hammamat, Tunisia
Contact: Dr. Asma Jajar, Chairperson of Organising Committee info@acpp-aspp.com
Website: acpp-aspp.com

7th International Bacterial Wilt Symposium
3 November - 7 November, 2020
Montevideo, Uruguay
Website: 7ibws2020.fq.edu.uy

7th International Conference of Pakistan Phytopathological Society
29 November - 1 December, 2020
University of Agriculture Faisalabad and Ayub Agricultural Research Institute, Faisalabad, Pakistan
Website: pakps.com/web/7icpps

4th International Conference on Global Food Security
6 December - 9 December, 2020
Montpellier, France
Website: www.globalfoodsecurityconference.com

10th International IPM Symposium
15 March - 18 March, 2021
Denver, Colorado, USA
Website: ipmsymposium.org/2021

16th Congress of the Mediterranean Phytopathological Union
20 April - 22 April, 2021
Limassol, Cyprus
Website: cyprusconferences.org/mpu2020

7th International Congress of Nematology
25 April - 30 April, 2021
Antibes Juan-les-Pins, France
Website: www.alphavisa.com/icn/2020/index.php

International Symposium on Cereal Leaf Blights
19 May - 21 May, 2021
Hammamet, Tunisia
Website: www.isclb2021.com

4th International *Erwinia* Workshop
5 June - 6 June, 2021
Assisi, Italy
Website: www.icppb2020.com

14th International Conference on Plant Pathogenic Bacteria
6 June - 11 June, 2021
Assisi, Italy
Website: www.icppb2020.com

Joint 18th International *Botrytis* Symposium & 17th International *Sclerotinia* Workshop
7 June - 11 June, 2021
Avignon, France
Website: colloque.inra.fr/botrytis-sclerotinia-2020

International Plant Health Conference "Protecting Plant Health in a changing world"
28 June - 1 July, 2021
Paasitorni Conference Centre, Helsinki, Finland
Website: www.fao.org/plant-health-2020/events/events-detail/en/c/1250609/

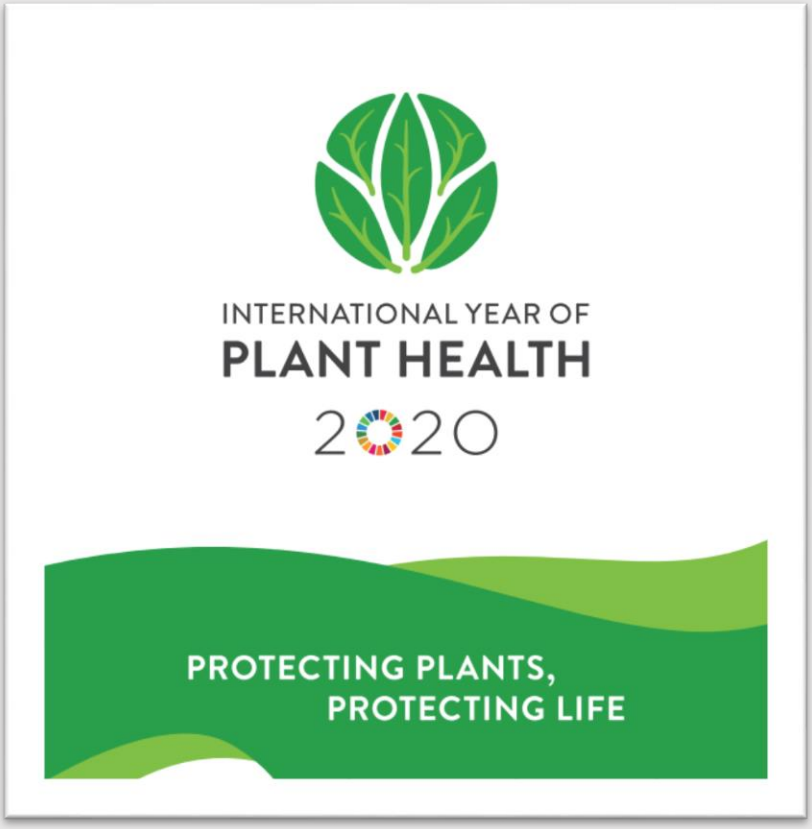
11th Australasian Soilborne Diseases Symposium
Mid-late 2022
Cairns, Queensland, Australia
Website: asds2020.w.yrd.currinda.com

XX International Plant Protection Congress
10 June - 15 June, 2023
Athens, Greece
Website: www.ippcathens2023.gr

12th International Congress of Plant Pathology (ICPP2023)
20 August - 25 August, 2023
Lyon, France
Website: www.icpp2023.org

9th ISHS International Postharvest Symposium
11 November – 15 November, 2024
Rotorua, New Zealand
Website: scienceevents.co.nz/postharvest2024

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)



WWW.ISPPWEB.ORG

The ISPP List is an e-mail list server which broadcasts messages and announcements to its subscribers. Its goal is to facilitate communication among members of the International Society for Plant Pathology and its Associated Societies. Advertised vacancies in plant pathology and ISPP Newsletter alerts are also sent to members of the ISPP List.

In accordance with the guidelines and recommendations established by the new EU General Data Protection Regulation 679/2016 (GDPR), the International Society for Plant Pathology has created a Privacy Information Notice containing all the information you need to know about how we collect, use and protect your personal data.

This policy explains when and why we collect personal information about our users, how we use it, the conditions under which we may disclose it to third parties, how we keep it safe and secure and your rights and choices in relation to your personal information.

Should you need further information please contact business.manager@issppweb.org

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