

# INTERNATIONAL NEWSLETTER ON PLANT PATHOLOGY

## ISPP Newsletter 46 (4) April 2016

News and announcements from all on any aspect of Plant Pathology are invited for the Newsletter. Contributions from the ISPP Executive, Council and Subject Matter Committees, Associated Societies and Supporting Organisations are requested.

**Editor: Daniel Hüberli** ([E-mail](#))

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### **CALL for bids to host the 12th International Congress of Plant Pathology, ICPP2023**

Associated Societies of ISPP are invited to present bids to host the 12th International Congress of Plant Pathology in 2023. Traditionally the ICPP is held in August.

ISPP councillors are urged to consider and discuss this opportunity with their Society.

The deadline for receipt of bids is 31 August 2016. They should be sent to the Business Manager of ISPP, with c.c. to the Secretary ISPP, as e-mail attachments and/or Web addresses.

*Peter Williamson Business Manager,  
International Society for Plant Pathology  
[businessmanager@ISPPweb.org](mailto:businessmanager@ISPPweb.org)*

*Dr Brenda Wingfield  
Secretary-General, International Society for Plant Pathology  
[ispp.secretary@isppweb.org](mailto:ispp.secretary@isppweb.org)*

For more information on bidding for the 12th International Congress of Plant Pathology, 2023, [please click here](#)

### **6th International Conference of the Indian Phytopathological Society, 23-27 February 2016**

The Indian Phytopathological Society (IPS) organized its 6th International Conference during 23-27 February 2016 at the NASC Complex, New Delhi, India. IPS was established in 1947, and has been organising International Conference at regular intervals since 1965. The 6th IPS conference was titled "Plant, Pathogens and People."

The Conference was an overwhelming success, attracting more than 750 delegates, speakers and sponsors from 35 countries and provided great intellectual and scientific interaction for the participants. The conference placed a specific emphasis on the role and the use of biodiversity in disease management, with a satellite meeting of Asian Plant Growth-Promoting Rhizobacteria (PGPR) Satellite Workshop.



The delegates at the 6th International Conference on "Plant, Pathogens and People" outside the NASC Complex, New Delhi, India.

(Serge Savary)

### **Scientists race to halt banana catastrophe**

Scientists in developing countries are scrambling to find a cure for a devastating fungus that threatens to wipe out the global banana trade and plunge millions of farmers into poverty.

Around the world, banana farmers are fighting a losing battle against Tropical Race 4, a soil fungus that kills Cavendish bananas, the only type grown for the international market. The disease was first spotted in the early 1990s in Malaysia, but has now started to wipe out crops in large parts of South-East Asia as well as in Africa and the Middle East. [1]

The Tropical Race 4 pathogen, a new strain of what is known as Panama disease, escaped from Asia in 2013. By 2015, it had infected plantations in Jordan and Mozambique, as well as Lebanon and Pakistan, with many scientists fearing an epidemic in Sub-Saharan Africa. [2]

The disease can be devastating for small banana farmers, who provide much of the 17 million tonnes of Cavendish bananas traded every year - mostly to rich countries where the fruit is popular as a healthy snack. Bananas are also a staple food in many tropical countries, and the main source of protein for more than half a billion people around the world.

Tropical Race 4, a variant of the *Fusarium oxysporum* fungus, is transmitted by infected plant matter, but also from the clothes and shoes of plantation workers.

[Read more.](#)

(SciDevNet, 29 February 2016)

### **International Year of Pulses 2016 at Springer**

The 68th UN General Assembly declared 2016 the International Year of Pulses to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production aimed towards food security and nutrition. Springer is joining the activities by providing free access to related journal articles and highlighting books – content ranging from disciplines such as plant sciences, agriculture and food sciences to ecology and environmental sciences. Open access journal articles are freely available online on a permanent basis and all other articles have been made freely available until May 15, 2016.

[Browse articles.](#)

### **Plants found to host beneficial fungi when required**

Scientists have believed for a long time that the role of plant immune system was only to distinguish between friend and foe and to fend off pathogens, but it is also involved in accommodating beneficial microorganisms in the plant when required. Researchers from the Max Planck Institute for Plant Breeding Research in Cologne, Germany, in collaboration with an international consortium of other laboratories discovered this relationship between the model plant *Arabidopsis thaliana* and the fungus *Colletotrichum tofieldiae*. The plant tolerates the fungus when it needs help in obtaining soluble phosphate from the soil and rejects the microbe if it can accomplish this task on its own.

*Arabidopsis* is one of the few plants without a mycorrhiza. Instead, it engages in a beneficial relationship with

the soil fungus *C. tofieldiae* which converts insoluble phosphate in the soil into soluble phosphate and releases the nutrient via the fungal mesh to its plant host. The research team discovered that an intact innate immune system is needed for the symbiosis and allows the fungus to take up residence in the plant's roots only if the plant is not able to obtain enough soil phosphate on its own. However, if phosphate is plentiful, the plant launches a massive immune response.

[Read full article.](#)

([Crop Biotech Update](#), 23 March 2016)

### **Researchers discover microbes use plant hormones to protect plants**

Researchers from the Department of Plant and Environmental Sciences at the University of Copenhagen have shown, for the first time, that the production of a plant hormone by a beneficial microbe is protecting a plant from a pathogenic microbe by inducing plant resistance. Plant beneficial microbes mediate biocontrol of diseases by interfering with pathogens or via strengthening the host, but the microorganisms' production of phytohormones, including cytokinins, has not been considered as a biocontrol mechanism before. The research team has now identified a novel mechanism of how bacterial production of cytokinin contributes to its ability to control plant diseases. According to Dominik Kilian Grosskinsky from the Department of Plant and Environmental Sciences, they have identified the ability of a bacterium to efficiently control a pathogen infection in a model plant by producing cytokinin, allowing the plant to maintain tissue integrity and ultimately biomass yield. The group has also shown the close link of the plant growth stimulating hormones to regulation of plant carbohydrate metabolism, and they linked the findings to the microbial activity related green islands in autumn leaves.

([Crop Biotech Update](#), 23 March 2016)

### **Dogs detect trees with citrus greening**

About 75% of groves in Florida, USA, are threatened by a disease known as citrus greening caused by a bacteria transmitted by Asian citrus psyllids. Trained dogs are being used to identify diseased trees before symptoms appear. Dogs, with 50 times more scent receptors in their noses than humans, sense chemicals that trees emit when infected. They're accurate 99.7% of the time, which is more accurate than DNA-sampling techniques that can require several hours or days to complete and are subject to lab-related and sampling errors. The dogs have detected the disease in trees that didn't show symptoms until days or weeks later. As there is no cure, growers hope the dogs will give them more time by slowing the contagion.

Florida's orange harvest is forecast to reach a 52-year low this season, down 71% since 2004, as the psyllids spread the bacteria. It cost the citrus industry \$7.8 billion and 7,500 jobs since 2006. The US Department of Agriculture is planning to dispatch most of the new canine unit to California, Arizona and Texas, where the disease is less widespread and early detection could be used more broadly.

[Read more.](#)

(M. Mittelman, BD Live, 22 March 2016)

### **Fourth edition of Compendium of Corn Diseases - new book**

Compendium of Corn Diseases, Fourth Edition. 2016. Gary P. Munkvold and Donald G. White (Eds). APS Press, 165 p.

With nearly 15 years since publication of the third edition, the Compendium of Corn Diseases, Fourth Edition was completely reviewed and updated to deliver the newest management recommendations and diagnostic information available from the world's top corn experts.

In total, the new edition covers nearly 90 diseases and disorders of corn found in the field and in storage, including:

- Diseases caused by bacteria, fungi, nematodes, and parasitic seed plants
- Nutrient deficiencies and toxicities
- Air pollution, extreme weather, and other environmental factors
- Herbicide injury

The Compendium has the most practical, up-to-date, and comprehensive management information available in one book. It includes detailed illustrated descriptions and field-tested management recommendations for each disease and disorder.

More than 300 high-quality colour images are included throughout the book to help field staff, crop consultants, diagnosticians, state and provincial extension agents, and crop scientists more easily identify and treat specific corn diseases and disorders.

This latest edition also includes completely new sections on the use of fungicides for foliar disease management, combating storage molds, and an appendix that helps users match common names of corn diseases with the names of their pathogens. A detailed description of this book can be found on [APS Press website](#).

### **Sweet potato viruses and phytoplasmas**

A review compiled by Sandra Dennien (Horticulture and Forestry Sciences, Department of Agriculture and Fisheries, Queensland, Australia) of sweet potato viruses and phytoplasmas found in Australia and worldwide, and their current detection method, was published online in March 2015. The review contains some excellent images of virus symptoms.

[Download PDF of review.](#)

(Grahame Jackson)

### **Systems-based approaches for the management of soilborne plant pathogens**

A review paper by D.O. Chellemi et al. titled "Development and deployment of systems-based approaches for the management of soilborne plant pathogens" was published in March 2016 by *Phytopathology* (vol. 106 pp. 216-225). The full paper is available on open access. The abstract is as follows:-

Biological suppression of soilborne diseases with minimal use of outside interventive actions has been difficult to achieve in high input conventional crop production systems due to the inherent risk of pest resurgence. This review examines previous approaches to the management of soilborne disease as precursors to the evolution of a systems-based approach, in which plant disease suppression through natural biological feedback mechanisms in soil is incorporated into the design and operation of cropping systems. Two case studies are provided as examples in which a systems-based approach is being developed and deployed in the production of high value crops: lettuce/strawberry production in the coastal valleys of central California (United States) and sweet basil and other herb crop production in Israel. Considerations for developing and deploying system-based approaches are discussed and operational frameworks and metrics to guide their development are presented with the goal of offering a credible alternative to conventional approaches to soilborne disease management.

[Read paper.](#)

### **Phytobiomes - A roadmap for research and translation**

On 25 February 2016, a group of scientific societies, companies, research institutes, and governmental agencies launched the Phytobiomes Roadmap presenting a new vision for agriculture to increase health, productivity, and sustainability of our current cropping and forest systems. The Roadmap outlines a strategic plan for acquiring critical knowledge of how all of the components on a farm interact and affect each other. These components - the crops, plants, microbes, animals, soils, and climate - are collectively called the phytobiome.

The document lays out an action plan to translate that knowledge into powerful new tools for crop management to produce a sufficient supply of food, feed and fiber to meet global needs in the future. This Roadmap comes at a critical time in which new innovative approaches are needed to sustainably increase global crop productivity to meet the demand of an additional 2.4 billion people by 2050. During that timeframe, experts predict that current agricultural systems will be facing multiple challenges due to more frequent extreme weather events, plateauing crop yields, and diminishing availability of land, water and other critical inputs.

Interactions within phytobiomes are dynamic and complex. The Roadmap advocates for a systems-level understanding of all the phytobiome components. It proposes to bring together current approaches and leverage and coordinate currently disparate activities to generate critical knowledge on how all constituents of phytobiomes interact with each other to affect crop health and yield.

Current technological developments - such as advances in genomic technologies, computational sciences, system-level approaches and precision agriculture - are enabling unprecedented insights for probing the complex interactions within phytobiomes. These technologies are providing extensive biological and environmental datasets. The Roadmap proposes to integrate these "big data" into predictive modeling systems to provide critical information to drive agricultural innovations.

The primary outcome is expected to be a shift in agricultural production from managing primarily individual

components of cropping systems to managing whole systems using comprehensive systems-based knowledge of phytobiomes.

Translating knowledge of phytobiomes into next generation precision agriculture tools and techniques will empower farmers to produce sufficient crops to meet global demands. For example, it could be envisioned that growers will have at their disposal crop varieties that better exploit phytobiome components in specific environments for stronger resilience to pests and limited water and nutrients. Another application would be new innovative management practices to grow crops on marginal and degraded lands with minimized negative impacts on the environment.

The Phytobiomes Roadmap was developed under the leadership of the American Phytopathological Society (APS), based on discussions and input provided by over 200 academic, industry, and government representatives at a workshop organized in Washington DC in July 2015, as well as from input by the scientific community and the general public through the [Phytobiomes website](#).

The Roadmap has broad support from professional societies, industry, government agencies, private foundations, non-profit institutes, and government-supported research networks.

(Jan Leach)

### **Second announcement of the International Conference on Plant Protection in the Tropics, Malaysia**

The Malaysian Plant Protection Society is pleased to organise the 9th International Conference on Plant Protection in the Tropics during 3-5 August 2016 in Kuching, Sarawak, Malaysia. The theme "Healthy Crops for a Healthy World" will focus on developments in the science of plant protection and discuss challenges faced by researchers, practitioners and consumers on problems related to plant protection. The programme will accommodate 2 keynote addresses with two plenary papers, concurrent oral sessions and poster presentations. For further information, see the [conference website](#).

### **Acknowledgements**

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