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

PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

ISPP NEWSLETTER

ISSUE 51 (4) APRIL 2021

Editor: Daniel Hüberli (**email**)

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IN THIS ISSUE:

CALL FOR BIDS TO HOST THE 13TH INTERNATIONAL CONGRESS OF PLANT PATHOLOGY, ICPP2028

Associated Societies of ISPP are invited to present bids to host the 13th International Congress of Plant Pathology in 2028. 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, 2021. 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.

Andrea Masino
Business Manager, International Society for Plant Pathology
business.manager@isppweb.org

Dr Brenda Wingfield
Secretary-General, International Society for Plant Pathology
ispp.secretary@isppweb.org

If a Society is considering a bid for the 13th International Congress of Plant Pathology, 2028, please read the bid and congress guidelines and requirements carefully. They can be accessed here.

PLANT PATHOLOGY IN FOOD SECURITY - THE APRIL 2021 ISSUE

SERGE SAVARY, EDITOR-IN-CHIEF OF *FOOD SECURITY*

The Food Security Series "Plant Pathogens Which Threaten Food Security", initiated by the ISPP with the Year of Plant Health, 2020, continues.

The upcoming April issue of *Food Security* includes an article by Pr. Jonathan Yuen, SLU, Uppsala, Sweden. In this article, J. Yuen provides us with an overview of the biological, as well as the economic, social, and political influence that *Phytophthora infestans*, the potato late blight pathogen, has had and still has in the world. Those interested to know why and how a foreign pathogen introduced in Western Europe caused a famine in the nineteenth century; how, in so doing, it contributed to the Century of Revolutions, and thus, to shaping the social, political, and economic world where we now live; and how the potato late blight epidemic in Ireland is related with a famous president of the United States of America, are urged to read this article.

Photos from J. Yuen, April 2021 issue of *Food Security*.

The Food Security Series "Plant Pathogens Which Threaten Food Security" will continue.

ICPP2023 FIRST ANNOUNCEMENT AND CALL FOR SATELLITE EVENTS

The International Society for Plant Pathology (ISPP) is pleased to announce the 12th International Congress on Plant Pathology (ICPP2023) that will take place from 20-25 August 2023 in Lyon, France. The French Phytopathological Society (SFP) is honored to organize this world event for the first time ! We hope that it will be the opportunity to bring together researchers from our community around the latest issues of Plant Health. Time is close to meet again in person and to find the way back to international congresses !

Call for satellite events: "Take advantage of the facilities set up during the ICPP2023-Lyon to carry out your own event in plant pathology!". A satellite event is a symposium or a workshop (half day, 1, 2 or 3 days) that will take place the weekend just before (or just after) the ICPP2023 on a topic of interest to ICPP attendees related to Plant Pathology or Plant Health. Satellite events will allow combination of both events into a single trip!

For more information go to
https://www.icpp2023.org/

Please forward this announcement to anyone who may be interested and Save the date !

Dr. Nathalie Poussereau (ISPP vice-president, ICPP2023 co-chair)
Dr. Mathias Choquer (SFP board member, ICPP2023 co-chair)

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.

- New dates for the 7th International Conference of Pakistan Phytopathological Society are 17 October - 20 October, 2021.

THE LIFE AND RESEARCH OF JOSÉ YORINORI, THE "FATHER OF SOYBEAN PATHOLOGY IN BRAZIL"

EUREKALERT, APS NEWS RELEASE, 24 MARCH 2021

Soybean rust--perhaps the most feared and studied of all soybean diseases--was first reported in Japan in 1902. It spread slowly, initially impacting only countries in the Eastern Hemisphere from Japan south to Australia and west to China and India. Then in the 1990s, the disease was reported in Hawaii and many African countries. Next, it moved to the Americas: to Paraguay in 2001, to Brazil in 2002, and finally to the continental United States in 2004.

Dr. José Yorinori, the "Father of Soybean Pathology in Brazil" (Photo credit: APS Press).

If left unchecked, soybean rust can cause yield reductions of up to 80%, according to Glen Hartman, a USDA-ARS research plant pathologist at the University of Illinois at Urbana-Champaign who focuses on soybean diseases and pests. He describes the development of soybean rust as "explosive under the right conditions--in just a week or two after the first diagnosis of soybean rust in a field, it can become an epidemic nightmare, producing billions upon billions of aerial-dispersed spores."

Hartman is one of the editors of Soybean Rust: Lessons Learned from the Pandemic in Brazil, the newest title from APS PRESS. This book was written by the late José Tadashi Yorinori, a pioneer researcher who "had the foresight to study rust before it was a problem in Brazil," according to Hartman, and then spent 10 years struggling to bring the disease under control. Yorinori's research and collaborations provided growers with "on-the-spot information about how to diagnose, manage, and reduce the impact of soybean rust," in Hartman's words. This important work "laid the foundation for rust management in Brazil and other countries."

Known to many as the "father of soybean pathology in Brazil," the research that Yorinori conducted across 30-plus years provided critical training materials for technical staff and farmers on the management of soybean diseases both in Brazil and worldwide. Yorinori published more than 1,000 technical reports and papers and oversaw exchange programs with technicians from South America, Mexico, and the United States. He also participated in several technical committees of the World Soybean Research Conference and other organizations.

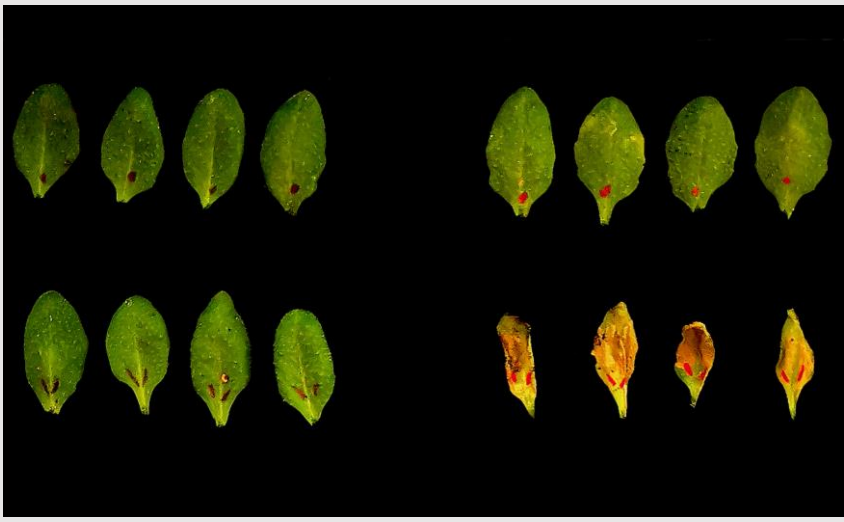
Yorinori's most significant contribution to the management of soybean rust was to develop and implement a program called the vazio sanitário ("sanitary void"), which requires farmers to maintain a 90-day period free of soybeans before the next summer planting, thereby reducing the overseasoning production of spores by the causal fungus. First applied in Mato Grosso State in 2006, this program is currently adopted by all the soybean-producing regions in Brazil and allows much greater efficiency in soybean rust control.

Soybean Rust: Lessons Learned from the Pandemic in Brazil is now available in the APS PRESS bookstore. Hartman recommends it as "a good read" for both experienced and novice plant pathologists interested in one of the greatest epidemics ever documented.

PLANT IMMUNITY REQUIRES TWO-STEP DETECTION OF INVADERS

THE SAINSBURY LABORATORY NEWS, 10 MARCH 2021

Plants perceive pathogens and activate immunity using two very different types of receptors. Receptors at the cell surface detect pathogen-derived molecules that accumulate outside plant cells, activating pattern-triggered immunity (PTI). PTI is suppressed by pathogen-derived effector proteins, that are injected into host cells to enable pathogen growth, but these effectors can be detected by intracellular receptors, resulting in effector-triggered immunity (ETI). Until now, it has not been clear how the defence mechanisms activated by these two distinct perception mechanisms interact.



Top left: control experiments with no immune receptors activated show no response. Bottom left: when only cell-surface immune receptors are activated, there is no visible response. Top right: when only intracellular immune receptors are activated, there is no visible response. Bottom right: when both cell-surface and intracellular receptors are activated, there is a robust immune response leading to local self-sacrificial plant cell-death that prevents the pathogen from growing and subsequently spreading to other leaves and plants (Photo credit: The Sainsbury Laboratory).

The challenge has been to study ETI without activating PTI by the pathogen. Scientists at The Sainsbury Laboratory were able to make their breakthrough by engineering the model plant *Arabidopsis thaliana* so that they could use a chemical to initiate the production of a recognized bacterial effector proteins inside plant cells to activate ETI without PTI.

PhD student Bruno Pok Man Ngou, Professor Jonathan Jones and the rest of the team found that neither immune system alone is sufficient to provide resistance to the plant pathogenic bacterium *Pseudomonas syringae*. However, when both are activated together, the pathogen is thwarted. They found that ETI enhances PTI, and PTI enhances ETI. In particular, detection of effectors by intracellular receptors greatly elevates the abundance of many of the key signalling components involved in activating plant defence upon pathogen detection by surface receptors. This replenishes their abundance after their attenuation by the pathogen's defence-suppression mechanisms.

These findings were corroborated by researchers from the Chinese Academy of Sciences who used a different but complementary approach. They used a modified version of *A. thaliana* with no functional surface receptors. These plants could therefore only mount ETI when challenged with the pathogen.

These discoveries strengthen the rationale for developing disease-resistant plants with several resistance genes to allow the perception of several effectors. Such gene-stacking not only makes a plant resistant to a wider range of pathogen variants, but also increases the intensity of the immune response to a pathogen with several recognised effectors. This research has answered a fundamental question in plant pathology that will help in the development of more durable disease-resistant crops. Importantly, such crops will require fewer inputs, such as chemical treatments, benefiting our environment.

This study, "Mutual Potentiation of Plant Immunity by Cell-surface and Intracellular Receptors", appears in *Nature*.

Fusarium spp. associated with root rot of pulse crops and their cross-pathogenicity to cereal crops

A paper by Swarnalatha Moparthi *et al.* titled "*Fusarium* spp. associated with root rot of pulse crops and their cross-pathogenicity to cereal crops in Montana" was published on March 2021 by *Plant Disease* (vol. 105, pp. 548-557). The abstract is as follows:-

Root rot caused by *Fusarium* species is a major problem in the pulse growing regions of Montana. *Fusarium* isolates (n = 112) were obtained from seeds and roots of chickpea, dry pea, and lentil. Isolates were identified by comparing the sequences of the internal transcribed spacer region and the translation elongation factor 1-α in Fusarium-ID database. *Fusarium avenaceum* was the most abundant species (28%), followed by *F. acuminatum* (21%), *F. poae* (13%), *F. oxysporum* (8%), *F. culmorum* (6%), *F. redolens* (6%), *F. sporotrichioides* (6%), *F. solani* (4%), *F. graminearum* (2%), *F. torulosum* (2%), and *F. tricinctum* (0.9%). The aggressiveness of a subset of 50 isolates that represent various sources of isolation was tested on three pulse crops and two cereal crops. Nonparametric analysis of variance conducted on ranks of disease severity indicated that *F. avenaceum* and *F. solani* isolates were highly aggressive on pea and chickpea. In lentil, *F. avenaceum* and *F. culmorum* were highly aggressive. In barley, *F. avenaceum*, *F. solani*, *F. culmorum*, and *F. graminearum* were highly aggressive. In wheat, *F. avenaceum*, *F. graminearum*, and *F. culmorum* were highly aggressive. Two *F. avenaceum* isolates were highly aggressive across all the crops tested and found to be cross-pathogenic. One isolate of *F. culmorum* and an isolate of *F. graminearum* obtained from chickpea and lentil seed were highly aggressive on barley and wheat. The results indicate that multiple *Fusarium* spp. from seeds and roots can cause root rot on both pulse and cereal crops. Rotating these crops may still lead to an increase in inoculum levels, making crop rotation limited in efficacy as a disease management strategy.

Read paper.

A pandemic clonal lineage of the wheat blast fungus

A paper by Joe Win *et al.* titled "*A pandemic clonal lineage of the wheat blast fungus"* was published on 18 March 2021 by *Zenodo*. The abstract is as follows:-

Wheat blast, caused by *Magnaporthe oryzae* (Syn. *Pyricularia oryzae*), was recently reported in Africa for the first time. To determine the relationship between African wheat blast isolates from Zambia with other populations from South America and Bangladesh, we analyzed the genotyping data recently reported by Tembo *et al.* (2021). The dataset consists of 84 single nucleotide polymorphisms (SNPs) obtained by multiplex amplicon sequencing from 186 isolates amended with data from 67 isolates mined from publicly available genome sequences. We observed that the Zambian isolates (N=13, 2018-2020) are identical for the 84 SNPs to isolates from Bangladesh (N=81, 2016-2020) and one genotype from South America (Bolivia, N=1, 2012). We conclude that the "B71" clonal lineage that emerged in South East Asia in 2016 and traces its origins to South America is now established in Zambia. Further analyses using whole genome sequences are needed to validate this conclusion. These findings call for urgent action, including a mitigation plan to prevent further spread.

Read paper.

GOING UNDERGROUND: GRANT ROOTS OUT RAPID APPLE DECLINE CULPRIT

ERIN RODGER, CORNELL CHRONICLE, 10 MARCH 2021

Since 2013, a mysterious phenomenon has been killing apple trees across North America, leaving growers panicked and scientists bewildered. The phenomenon has been named rapid apple decline (RAD) for its sudden onset, which causes apple trees to quickly deteriorate and die. Now, two scientists from the College of Agriculture and Life Sciences in Cornell University, USA, are on a mission to track down its cause. This effort is thanks to a recent $299,000 grant from the U.S. Department of Agriculture's National Institute of Food and Agriculture. The three-year project, "Root Traits and Rapid Decline of Apple Trees in High-Density Orchards," is one of the first federally funded projects to research rapid apple decline in the United States.

Awais Khan, associate professor of plant pathology and plant-microbe biology, examines apples in an orchard (Photo credit: Allison Usavage, Cornell University).

In Geneva, New York, two researchers at Cornell AgriTech first teamed up in 2018 to explore potential causes of RAD, such as pathogens, insects, cold weather injury and root systems' interactions. While their findings revealed no direct above-ground causes, they noticed that a weaker root system could potentially contribute to the trees' decline. "So very little is known about the below-ground root system of apple rootstocks right now," said Awais Khan, co-principal investigator and associate professor of plant pathology and plant-microbe biology. "By performing a comprehensive analysis of these systems, we are hopeful that this project will uncover the answers the apple industry has been looking for."

He and Marc Fuchs, professor of plant pathology and plant-microbe biology, will hone in on the complex dynamics of apple root systems and explore the behavior of viruses in commercial apple orchards. While roots are an important component of any apple orchard, knowledge of their growth and architecture is scarce due to the difficulty and cost involved with studying them. Few technologies exist to help scientists study these systems, and digging up trees in an orchard to examine their root traits is not only expensive but destructive.

As part of his research, Khan will explore a possible connection between high-density orchard systems and RAD. By planting small nursery trees in a greenhouse with spacing that is comparable to the close spacing of these systems, Khan will replicate the way in which roots may potentially compete with each for nutrient uptake. Fuchs will establish whether the presence of viruses in these nursery trees may weaken the root system of declining trees. The nursery plant roots will be examined after one, two and three years and a 3D root system of each will be documented. From there, the trees will be planted and then dug up over a three-year period to assess how they have grown over time.

Read more.

THE CHALLENGE OF FEEDING THE WORLD SUSTAINABLY

The need for sustainable agriculture is becoming ever more significant. The world's population is still increasing, requiring more from our agricultural systems. Malnutrition and diet-related illnesses are present in nearly all societies. At the same time, agriculture plays a significant role in some of the biggest environmental challenges that humanity is facing, including the climate crisis, biodiversity loss, deforestation, and the pollution of our soil, water, and air. The need to balance the growing demand for nutritious food with these environmental threats is a complex issue, and ensuring sustainable food systems will require a collaborative effort from many different communities.

These issues were addressed during the US-UK Scientific Forum on Sustainable Agriculture held in Washington, DC, on March 5-6, 2020. Organized by the National Academy of Sciences and the United Kingdom's Royal Society, the forum brought together leading scientists, researchers, policy makers, and practitioners in agricultural sciences, food policy, biodiversity, and environmental science (among other specialties). The forum provided an opportunity for members of these research communities to build multidisciplinary and international collaborations that can inform solutions to a broad set of problems. This publication summarises the presentations of the forum.

Download free PDF of "The Challenge of Feeding the World Sustainably: Summary of the US-UK Scientific Forum on Sustainable Agriculture (2021)."

23RD BIENNIAL AUSTRALASIAN PLANT PATHOLOGY SOCIETY CONFERENCE

KARA BARRY, CONFERENCE CONVENOR

We welcome the plant pathology community to what will be both the 23rd Biennial Australasian Plant Pathology Society Conference and our 1st fully online conference! This event was originally planned to be held in Hobart, Tasmania, however, due to the potential for ongoing impacts from COVID-19, we have decided to hold a fully online conference.

The theme for the conference is "Stay Connected for Plant Health". A fully online format will allow us to plan with certainty and we are confident that all the key aspects of previous conferences (keynote speakers in plenary sessions, oral presentations across concurrent sessions and, poster presentations), can be well supported online. The system will provide user-friendly virtual networking and options to engage with exhibitors.

Please join us at the conference to stay connected with colleagues, support our emerging scientists and showcase and access the most recent plant pathology research.

Abstracts and registrations are now open. For more information visit the APPS conference wesbite.

BSPP INFOGRAPHICS STUDENT COMPETITION 2020

As the annual British Society for Plant Pathology (BSPP) conference was cancelled, there were no associated poster and presentation prizes awarded for 2020. So, we launched our first ever Student Infographics Competition to encourage a new way of communicating science.

Our 7 entrants agreed that, "with online communication becoming increasingly prevalent, infographics are a vital aspect of scientific research" and "a great way to share our science".

There were two winners and five runners up, you can see their entries and read more about them below. Winners were both awarded a cash prize of £150.

Usman Hussain (Joint Winner)

Usman Hussain is a PhD student, studying oak microbiomes and Acute Oak Decline with James McDonald at Bangor University, Wales.

"My favourite part of this PhD project is the amazing opportunities it presents; it allows me to conduct innovative research whilst benefitting the UK's natural environment."

"One of the opportunities given to me was to apply to this fantastic infographic competition! I believe it is vital for scientists to be able to communicate their ideas and findings as collating information allows us to become better scientists and research with higher efficiency. This competition is a great way of gathering scientists from across the globe and allowing them to share their hard work to other scientists but also to the public. With online communication becoming increasingly prevalent, infographics and posters are now a vital aspect of scientific research."

Maninder Kaur (Joint Winner)

Maninder Kaur is a PhD student researching the application of cold plasma technology to postharvest cereal grain to manage *Fusarium graminearum* contamination and associated mycotoxin production. Her work is supported by a Department of Primary Industries and Regional Development scholarship and supervised by Daniel Huberli from the Department of Primary Industries and Regional Development and Kirsty Bayliss from Murdoch University, Australia.

"The importance of innovation and adaptation to continuously evolving conditions has been well demonstrated during the COVID-19 epidemic. This virtual competition is an excellent example of the transformation to online communication."

"Similarly, cold plasma could potentially be a future transformational technology for the treatment of contaminated stored cereal grain, ensuring food safety whilst also avoiding the harmful effects of chemicals on ourselves and the environment."

The Runners Up included Raisa Osama, Athina Koutouleas, Luca Steel, Becca Claxton, and Isabelle Simms. All posters can be viewed on the BSPP website.

CURRENT VACANCIES

No current vacancies.

ACKNOWLEDGEMENTS

Thanks to Greg Johnson, Jan Leach, and Serge Savary for contributions.

COMING EVENTS

16th Congress of the Mediterranean Phytopathological Union
Postponed – the conference will be rescheduled either for Autumn 2021 or Summer 2022
Limassol, Cyprus

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

BotrySclero Webinar
8 June - 10 June, 2021
Avignon, France
Website: colloque.inra.fr/botrytis-sclerotinia-2020

International Phytobiomes Conference 2021
14 September - 17 September, 2021
Denver, Colorado, USA
Website: phytobiomesconference.org/

7th International Conference of Pakistan Phytopathological Society
17 October - 20 October, 2021
University of Agriculture Faisalabad and Ayub Agricultural Research Institute, Faisalabad, Pakistan
Website: 7icpps.pakps.com

13th Arab Congress of Plant Protection
31 October - 5 November, 2021
Le Royal Hotel, Hammamat, Tunisia
Contact: Dr. Asma Jajar, Chairperson of Organising Committee info@acpp-aspp.com
Website: acpp-aspp.com

Australasian Plant Pathology Society Conference – Staying Connected for Plant Health
23 November - 26 November, 2021
Online conference
Website: appsconference.com.au/home

International Plant & Animal Genome XXIX
8 January -12 January, 2022
San Diego, California, USA
Website: www.intlpag.org/2021/

10th International IPM Symposium
28 February - 3 March, 2022
Denver, Colorado, USA
Website: ipmsymposium.org/2021

7th International Congress of Nematology
1 May - 6 May, 2022
Antibes Juan-les-Pins, France
Website: www.alphavisa.com/icn/2020/index.php

International Plant Health Conference "Protecting Plant Health in a changing world"
Week of 12 May 2022
Location to be advised
Website: www.fao.org/plant-health-2020/events/events-detail/en/c/1250609/

4th International *Erwinia* Workshop
2 July - 3 July, 2022
Assisi, Italy
Website: www.icppb2020.com

14th International Conference on Plant Pathogenic Bacteria
3 July - 8 July, 2022
Assisi, Italy
Website: www.icppb2020.com

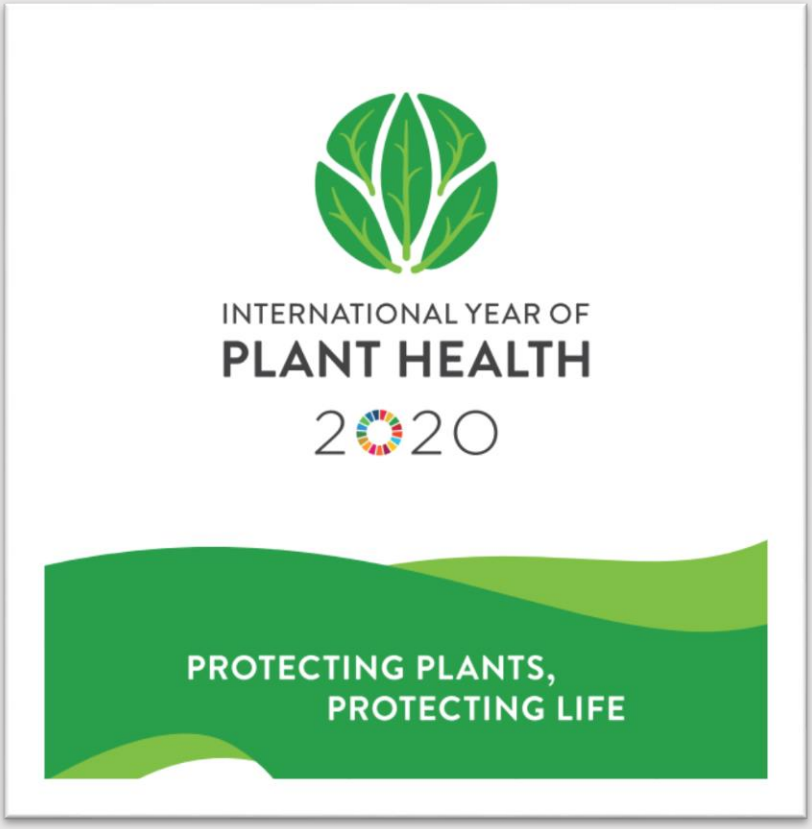
11th Australasian Soilborne Diseases Symposium
Mid-late 2022
Cairns, Queensland, Australia
Website: asds2020.w.yrd.currinda.com

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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