



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

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IN THIS ISSUE:

The global burden of pathogens and pests on food crops

Phytopathology focus issue - Addressing the new global threat of *Xylella fastidiosa*

Resuscitated @PestNet Twitter account

Eve Billing passed away on 18 February

Wheat holiday for blast

Australasian Plant Pathology special issue on Botryosphaeriales

Classify viruses –The gain is worth the pain

Microscopic tornadoes of spores released during rainfall

EMPHASIS on the International Year of Plant Health

Plant scientist awarded Nancy Millis Medal for Women in Science

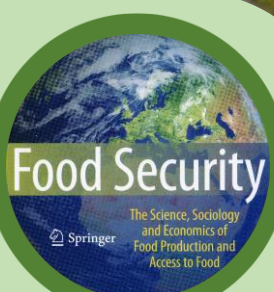
11th International Workshop Grapevine Trunk Diseases – Deadline extension

Obituary of Edward Rosario Provvidenti, 1921-2019

Current Vacancies

Acknowledgements

Coming Events



INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)

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THE GLOBAL BURDEN OF PATHOGENS AND PESTS ON FOOD CROPS

SERGE SAVARY, EDITOR-IN-CHIEF FOR FOOD SECURITY

WHY IS THIS IMPORTANT?

Crop pathogens and pests constitute a burden to food production worldwide: plant diseases and pests are frequent causes for crop losses – losses in quantity or in quality of harvests – irrespective of the agrosystems, whether in small-scale, diverse, single-cycle, "traditional" agriculture, or in large-scale, genetically uniform, monoculture-based, "intensive" systems. Yet, while pathogens and pests (P&Ps) are widely considered an important cause of crop losses, and sometimes a threat to food security, precise figures on these crop losses are very hard to produce.

Estimating losses is difficult for two reasons. One is because P&Ps are integral parts of the human-made agrosystems, in which they have evolved with crops over millennia. As a result, the effects of P&Ps in agriculture are very hard to disentangle from the complex web of interactions among factors at play within agrosystems. The second is due to the sheer diversity of P&Ps, which includes viruses and viroids, bacteria, fungi and oomycetes, nematodes, arthropods, molluscs, vertebrates and parasitic plants. This diversity means that the quantification of losses on an individual pathogen or pest basis, for each of the many cultivated crops, is a daunting task.

HOW THE PROBLEM WAS ADDRESSED?

During the 10th International Congress of Plant Pathology held in Beijing in 2013, the recently created [Crop Loss Subject Matter Committee](#) of the International Society for Plant Pathology (ISPP) decided that a survey on P&P losses should be conducted among crop health experts. This worldwide online survey was conducted with the support of the ISPP between Nov 1, 2016 and Jan 31, 2017, reaching over 2,500 members of the ISPP, along with nearly 100 specific crop health experts of

several organisations, including CGIAR institutes and Rothamsted Research.

Using a very simple online questionnaire, we collected almost 1,000 responses from 219 crop health experts on five major food crops (wheat, rice, maize, soybean, and potato) in 67 countries. We chose these five crops since together they provide about 50% of the global human calorie intake. The 67 countries represent a substantial fraction (84%) of the global production of these five crops.

LOSSES ARE SUBSTANTIAL AND THEY VARY ACROSS FOOD SECURITY HOTSPOTS

The "global burden of pathogens and pests" documents losses associated with 137 P&Ps in wheat, rice, maize, potato and soybean worldwide. At a global scale, we estimate that the range of losses are 10.1–28.1% in wheat, 24.6–40.9% in rice, 19.5–41.1% in maize, 8.1–21.0% in potato, and 11.0–32.4% in soybean.



Sheath blight on rice

These hotspots are critical sources and/or sinks in the global food system: North-West Europe, the plains of the US Midwest and Southern Canada, Southern

Our results highlight differences in impacts among crop pathogens and pests and among food security hotspots. But we also show that the highest losses

INFORMATION TO SUPPORT ACTION TO ADDRESS CHRONIC AND EMERGING CROP PATHOGENS AND PESTS

Quantification of crop losses provides a measure of past advances and a benchmark for future progress in crop health management. Our results provide a



Stripe rust (yellow rust) in wheat

Brazil and Argentina, the Indo-Gangetic Plains of South Asia, the plains of China, South-East Asia, and Sub-Saharan Africa.

appear associated with food-deficit regions with fast-growing populations, and frequently with emerging or re-emerging pests and diseases.

basis for research and policy prioritisation of crop health management. Some P&Ps occur chronically – meaning they occur regularly and over large areas. For chronic P&Ps, efforts to deliver more efficient and sustainable management tools, such as resistant varieties, are needed. Some P&Ps are emerging or re-emerging and are associated with recent large increases in losses in specific food security hotspots. For emerging or re-emerging P&Ps, urgent action is needed to contain them and efforts to generate long term solutions, such as varietal resistance, need to be undertaken rapidly.

LINKS

S. Savary, L. Willocquet, S. J. Pethybridge, P. Esker, N. McRoberts and A. Nelson, (2019) “The global burden of pathogens and pests on major food crops”, *Nature Ecology & Evolution*. [doi:10.1038/s41559-018-0793-y](https://doi.org/10.1038/s41559-018-0793-y)

PHYTOPATHOLOGY FOCUS ISSUE – ADDRESSING THE NEW GLOBAL THREAT OF *XYLELLA FASTIDIOSA*

Though the plant pathogen has a long history of harming agricultural crops and trees in the Americas, *Xylella fastidiosa* was discovered in Europe for the first time, affecting olive trees in southern Italy, in 2013. Since then *X. fastidiosa* has been found in France, Spain, and parts of Asia, making it a global threat to food production, forestry, and landscapes. This development sparked an increased interest in monitoring and management efforts and led to growing research efforts beyond the Americas, as revealed by [Phytopathology Focus Issue Addressing the New Global Threat of *Xylella fastidiosa*](#).

Open communication and collaboration on a global scale are key to understanding and combating *Xylella*. This focus issue represents that ideal; of the 20 articles included, nine originate from research in Europe. These articles highlight key challenges in addressing this global threat, recent advances in understanding bacteria-plant-insect interactions, and lines of research on disease control while looking forward to more permanent solutions as the breadth and depth of research continues to expand globally.

RESUSCITATED @PESTNET TWITTER ACCOUNT

GRAHAME JACKSON, PESTNET

The @PestNet Twitter account has been resuscitated. Please join PestNet's Twitter feed - <https://twitter.com/PestNet>.

Losa Naivalulevu, Fiji, is the Twitter person (and moderator) who is not only putting out messages that appear on PestNet's service but also from a multitude of other sites.

There are lots of interesting tweets on plant protection!



EVE BILLING PASSED AWAY ON 18 FEBRUARY

JAN LEACH, ISPP PRESIDENT

Dr. Eve Billing, a plant pathologist who retired from East Malling Research Station in the UK many years ago, passed away on 18th February, at the age of 95. Eve was a leader in research on fireblight disease over her entire career. An obituary will appear in the April issue of the ISPP Newsletter.

WHEAT HOLIDAY FOR BLAST

CIMMYT

In an attempt to curb the spread of this disease, policymakers in the region are considering a “wheat holiday” policy: banning wheat cultivation for a few years in targeted areas. Since wheat blast’s *Magnaporthe oryzae* pathotype *triticum* (MoT) fungus can survive on seeds for up to 22 months, the idea is to replace wheat with other crops, temporarily, to cause the spores to die. In India, which shares a border of more than 4,000 km with Bangladesh, the West Bengal state government has already instituted a two-year ban on wheat cultivation in two districts, as well as all border areas. In Bangladesh, the government is implementing the policy indirectly by discouraging wheat cultivation in the severely blast affected districts.

CIMMYT researchers recently published in two ex-ante studies to identify economically feasible alternative crops in Bangladesh and the bordering Indian state of West Bengal. In both studies close with an urgent plea for international financial and technical support for collaborative research on disease epidemiology and forecasting, and the development and dissemination of new wheat blast-tolerant and resistant varieties and complementary management practices – crucial steps to ensuring food security for more than a billion people in South Asia.

[Read more.](#)

AUSTRALASIAN PLANT PATHOLOGY SPECIAL ISSUE ON BOTRYOSPHAERIALES

OLUFEMI A. AKINSANMIEMAIL, ROSALIE DANIEL, AND ROGER SHIVAS

The special issue in *Australasian Plant Pathology on Botryosphaeriales* was inspired by two workshops, (i) a workshop on the identification and classification of *Botryosphaeriales* at the University of Southern Queensland, Australia, 26–30 June 2017 that was organised by the Subcommittee on Plant Health Diagnostics in collaboration with Plant Health Australia and funded by the Department of Agriculture and Water Resources through a grant from the Modern Diagnostics initiative as part of a professional development program for plant health diagnosticians; and (ii) a one-day symposium ‘*Botryosphaeriaceae* menace: Taxonomy, disease impact, ecology and management’ at the Science Protecting Plant Health 2017 conference held in conjunction with the Australasian Plant Pathology Society biennial conference, Brisbane, 25 September 2017. This issue contains reviews and original research articles on *Botryosphaeriales* in Australia and New Zealand.

This special issue highlights the need for a multi-disciplinary and across-industry collaborative approach to research into the economically important diseases caused by species of *Botryosphaeriales* in Australia. The biology of these fungal pathogens, as well as their ecology and epidemiology, is still poorly understood. This information will ultimately strengthen management practices and enhance biosecurity efforts to prevent new incursions.

CLASSIFY VIRUSES – THE GAIN IS WORTH THE PAIN

JENS H. KUHN AND COLLEAGUES, NATURE, 20 FEBRUARY 2019

Earth probably harbours a million times more virus particles than there are stars in the observable Universe. These viruses could hold solutions to many of humanity’s current problems. Phage therapy could someday be used to treat diseases caused by multidrug-resistant bacteria, for instance. Enzymes encoded by new viruses could help researchers to develop pharmaceuticals. Or viruses that kill algal cells could be used to control harmful blooms. Tapping into the benefits and threats requires describing and cataloguing viruses and mapping their evolutionary relationships. But, so far, just 4,958 virus species have been formally described. Comparative analyses of the genomes of these and numerous unclassified viruses show that the current taxonomy is vastly incomplete and, in places, even wrong. [Read more.](#)

MICROSCOPIC TORNADOES OF SPORES RELEASED DURING RAINFALL

KRISTIN ROSE, VIRGINIA TECH DAILY, 25 FEBRUARY 2019

Recent research in the Schmale Lab at Virginia Tech, US and the Jung Lab at Cornell University, US has illuminated how the splashing of rain droplets can transport spores of pathogens from infected plants. The team used high-speed video cameras to observe microscopic tornadoes of rust spores generated from the impact of raindrops on infected wheat leaves. [Their findings](#), which were recently published in the *Proceedings of the National Academy of Science* (PNAS), have implications for preventing disease spread in wheat crops.

The researchers set up experiments using a high-speed video camera to capture images of raindrops impacting wheat plants infected with the rust fungus, *Puccinia triticina*. These experiments shed new light on the physics of spore dispersal during rainfall.

This previously unknown method of air-vortex dispersal is a swirling mechanism that can be likened to a mini-tornado of air that carries the plant pathogens off the plant and onto air currents, with the potential for transport over much longer distances. The air-vortex dispersal mechanism could explain abrupt increases in spores in the atmosphere immediately after major rainfall events. Understanding the spread of plant pathogens during rainfall could help farmers better manage the timing of fungicide applications to their crops.

[Read more.](#)



EMPHASIS ON THE INTERNATIONAL YEAR OF PLANT HEALTH

ANDREA MASINO, ISPP BUSINESS MANAGER

The results of the European Project EMPHASIS (www.emphasisproject.eu) have been presented in Torino, Italy on 12 February 2019 during the workshop “EMPHASIS on the International Year of Plant Health” organised by the Project Coordinator Agroinnova, the Center of Competence for the Innovation in the agro-environmental field of the University of Torino.



The main aim of the EMPHASIS project, funded within the Horizon 2020 Programme of the European Commission, which lasted 4 years with a budget of almost 7 million Euro, was to ensure the safety of the food chain and to protect biodiversity through the development of effective practical solutions and mechanisms that can prevent the spread of epidemics and protect the European agricultural and forest system. The Consortium included Italy, Belgium, Spain, Holland, France, England, Latvia, Czech Republic, Hungary and Canada.

The event, chaired by ISPP Past President Maria Lodovica Gullino, took place with the participation of numerous international speakers, including Ralf Lopian, Special Advisor at the Ministry of Agriculture of Finland and first promoter of IYPH with the International Plant Protection Convention of FAO. He also designed the guidelines for the celebrations scheduled for 2020. His speech was preceded by a round table discussion attended by representatives of the Italian Ministry of Agriculture and some of the main European Institutions in agriculture and biosecurity field, at which the most effective ways to transfer the results of the research to the productive world were debated.



PLANT SCIENTIST AWARDED NANCY MILLIS MEDAL FOR WOMEN IN SCIENCE

THE UNIVERSITY OF WESTERN AUSTRALIA MEDIA RELEASE, 28 FEBRUARY 2019

A plant scientist from The University of Western Australia, Perth, who made significant breakthroughs in disease resistance in the oilseed crop canola has been awarded the prestigious 2019 Nancy Millis Medal for Women in Science. The Nancy Millis Medal recognises mid-career female scientists who have demonstrated exceptional leadership and established an independent research program in the natural sciences. The medal honours the contributions made to science by the late Professor Nancy Millis AC MBE FAA FTSE and recognises her importance as a role model for aspiring female scientists in Australia.

UWA recipient Professor Jaqueline Batley from the School of Biological Sciences researches crop genetics to enable breeders to produce better crops with resistance to disease and climatic conditions. "I'm studying the DNA of plants to better understand genes that lead to greater crop resilience," she said.

"If we can improve the quality and quantity of crop production, this will have huge benefits globally. A

major factor of famine is crop failure so if we can work out ways to improve crop production security this will have huge benefits to populations and the agriculture industry across the globe."

Professor Batley said she was honoured to receive the award and hoped it would encourage young women to see the amazing benefits of a career in STEM. "Nancy Millis was inspirational and a great role model and I hope I can be a role model to other aspiring female scientists," she said. "Science is so very important in our lives. It means what we discover is based on fact - not just an idea, and improves our lifestyles, our health and our knowledge."

UWA Vice-Chancellor Professor Dawn Freshwater said Professor Batley was a great role model for aspiring female scientists. "STEM is one of the fastest growing fields with so many opportunities, yet women are still under-represented," Professor Freshwater said "This is a fantastic example of the impact talented women can make to science and how they can inspire the next generation."



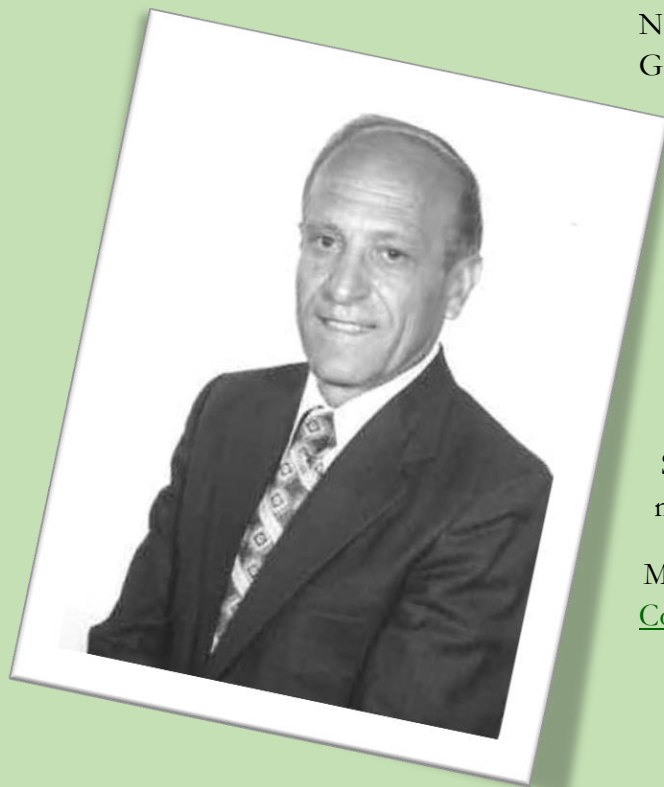
11TH INTERNATIONAL WORKSHOP GRAPEVINE TRUNK DISEASES—DEADLINE EXTENSION

JOSÉ RAMÓN ÚRBEZ TORRES

Due to multiple requests, the organising committee has decided to extend the deadline for Early Bird Registration and Abstract Submission until 24:00 hours (Pacific Standard Time) of 31 March 2019.

The organising committee is very excited to inform all of you that thanks to a generous sponsorship from E. & J. Gallo Winery we will have at this upcoming workshop the First International Workshop on Grapevine Trunk Diseases Student Presentation Competition Awards. More information on this will soon be provided but please, encourage your students to participate in this workshop as there will be awards for best oral and poster presentations.

More information: <http://iwgtd2019.ca/>



OBITUARY OF EDWARD ROSARIO PROVVIDENTI, 1921- 2019

K. RAMANUJAN, 13 FEBRUARY 2019

Rosario Provvidenti, Liberty Hyde Bailey Professor Emeritus of plant pathology, died on 1 February in Geneva, New York. He was 97. Considered one of the world's foremost authorities on viral diseases of vegetables, Provvidenti was a leader in the identification and characterisation of emerging and regulated plant viruses. He also pioneered the use of genetic approaches for managing these diseases.

Born in 1921 in Gela, Sicily, Provvidenti completed a bachelor's degree in agricultural science at the University of Catania in 1942 and a doctorate in microbiology at the University of Palermo in 1947. He was an assistant professor of plant pathology at the Agricultural Technical Institute in Siracusa, Italy, 1947-50, and a plant pathologist at the Polytron Corporation in White Plains, New York, 1950-54.

He joined Cornell as a research associate at the then-New York State Agricultural Experiment Station in Geneva in 1954. He had the rare distinction of being promoted from a non-professorial position to professor of plant pathology in 1984, before being named a Liberty Hyde Bailey Professor of plant pathology in 1987. He retired in 1991.

He was honored with an award of merit from the Northeastern Division of the American Phytopathological Society in 1985 and was named a fellow of the American Phytopathological Society in 1986. He was an author or co-author of more than 200 publications.

More detailed obituary in the [Cornell Chronicle](#).

CURRENT VACANCIES

The Department of Plant Pathology at the **Washington State University** seeks to fill a 12-month, permanent, full time tenure-track position at the rank of Assistant Professor of Plant Pathology. The position has research and extension responsibilities in potato pathology and teaching responsibilities at the undergraduate and graduate levels. Application screening will begin on 30April 2019 and remain open until filled. Further details about the position and how to apply are available in the [PDE](#).

ACKNOWLEDGEMENTS

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

COMING EVENTS

65th Annual Conference on Soilborne Plant Pathogens (formerly Soil Fungus Conference) and the 50th Annual Statewide California Nematology Workshop

26 March - 28 March, 2019
San Marino, California, USA
Website: soilfungus.wsu.edu

19th International Reinhardtsbrunn Symposium on Modern Fungicides and Antifungal Compounds

7 April - 11 April, 2019
Friedrichroda, Germany
Website: plant-protection.net/de/reinhardtsbrunn

1st International Molecular Plant Protection Congress

10 April - 13 April, 2019
Adana, Turkey
Website: www.imppc2019.org

Joint Meeting of the IUFRO working parties "Shoot, foliage and stem diseases" and "Wilt diseases" (7.02.02 and 7.02.03)

6 May - 10 May, 2019
Figline Valdarno, Florence, Italy
Website: www.iufro.org/download/file/29599/2749/florence19-1st-announcement_doc/

2nd International Conference on Holobionts

8 May - 10 May, 2019
Montréal, Québec, Canada
Website: www.fourwav.es/view/1040/info/

14th International Plant Virus Epidemiology Symposium

13 May - 17 May, 2019
Seoul, South Korea
Website: www.ipve2019.com

5th International Symposium on Postharvest Pathology: From Consumer to Laboratory - Sustainable Approaches to Managing Postharvest Pathogens

19 May - 24 May, 2019
Liège, Belgium
Website: www.postharvest2019.be

International Symposium on Cereal Leaf Blights 2019

22 May - 24 May, 2019
University College Dublin, Dublin, Ireland
Website: www.isclb2019.com

Functional Metagenomics 2019

16 June - 19 June, 2019
Trondheim, Norway
Website: www.sasm.org.za/component/k2/item/219-functional-metagenomics-2019

20th *Fusarium* Laboratory Workshop

23 June - 28 June, 2019
Kansas State University, Manhattan, Kansas, USA
Website: www.plantpath.k-state.edu/events.fusarium

Rhizosphere 5

7 July - 11 July, 2019
Saskatoon, Saskatchewan, Canada
Website: www.rhizo5.org

11th International Workshop on Grapevine Trunk Diseases

7 July - 12 July, 2019
Penticton, British Columbia, Canada
Website: iwgtd2019.ca/

4th International Symposium on Biological Control of Bacterial Plant Diseases (BIOCONTROL2019)

9 July - 11 July, 2019
Viterbo, Italy
Website: www.biocontrol2019.com

XVIII International Society for Molecular Plant-Microbe Interactions Congress

14 July - 18 July, 2019

Glasgow, Scotland

Website: www.ismpmi.org/Congress/2019

1st International Wheat Congress

21 July - 26 July, 2019

Saskatoon, Saskatchewan, Canada

Website: 2019iwc.ca

American Phytopathological Society Annual Meeting – Plant Health

3 August - 7 August, 2019

Cleveland, Ohio, USA

Website:

www.apsnet.org/meetings/2019/Pages/default.aspx

International Workshop on the Fruit Microbiome: A New Frontier

3 September - 6 September, 2019

National Conservation Training Center, Shepherdstown, West Virginia, USA

Website: www.bard-isus.com/fruitmicrobiome.html

Working Party Meeting of IUFRO WP 7.03.10 Methodology of forest insect and disease survey in Central Europe - “Recent Changes in Forest Insects and Pathogens Significance”

16 September - 20 September, 2019

Suceava, Romania

Website: www.silvic.usv.ro/iufroromania2019/

22nd Biennial Conference of the Australasian Plant Pathology Society

25 November - 28 November, 2019

Melbourne, Australia

Website: www.apps2019.org

International Symposium on Microbe-Assisted Crop Production – Opportunities, Challenges and Needs

2 December - 5 December, 2019

Vienna, Austria

Website: micrope.org/

16th Congress of the Mediterranean Phytopathological Union

23 March - 27 March, 2020

Limassol, Cyprus

Website: cyprusconferences.org/mpu2020

14th International Conference on Plant Pathogenic Bacteria

7 June - 12 June, 2020

Assisi, Italy

Website: www.icppb2020.com

Asian Conference on Plant Pathology: Importance and Impact of Global Plant Health

15 September - 18 September, 2020

Tsukuba International Congress Center, Ibaraki, Japan

Website:

www.ppsj.org/pdf/meeting/2020_ACPP.pdf?0913-2

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

IX International Postharvest Symposium

9 November - 13 November, 2020

Rotorua, New Zealand

Website: scienceevents.co.nz/postharvest2020

12th International Congress of Plant Pathology (ICPP2023)

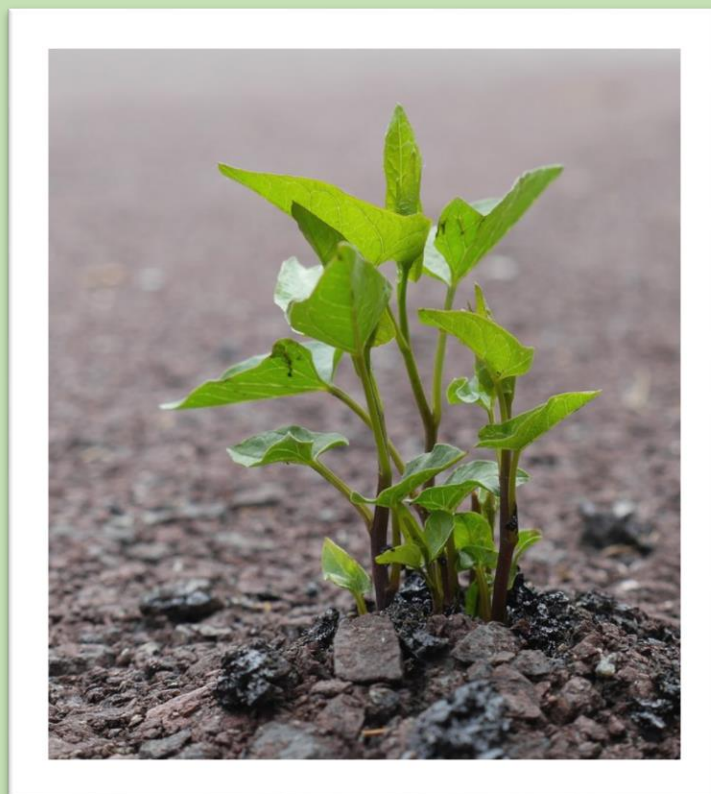
20 August - 25 August, 2023

Lyon, France

Website: www.icpp2023.org



INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)



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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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