



**ISPP** INTERNATIONAL SOCIETY  
FOR PLANT PATHOLOGY

PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

# ISPP NEWSLETTER

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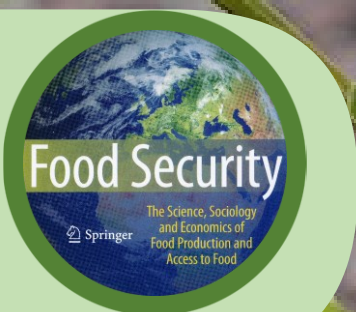
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INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)

[WWW.ISPPWEB.ORG](http://WWW.ISPPWEB.ORG)

## **EIGHTH UPDATE ON ISPP RESILIENCE BURSARY FOR PLANT PATHOLOGISTS**

**ANHELINA KYRYCHENKO, MAŁGORZATA JĘDRYCZKA, MAŁGORZATA MAŃKA AND GREG JOHNSON**

As the end of the year approaches, there are times for family, holiday celebration and reflection on the year's progress, with anticipation of what 2023 will bring.

For our Ukrainian colleagues, the usual reflections and celebrations are on hold, and in some cases, literally frozen in time - with blackouts, limited access to electricity and the internet, winter chill and worries about loved ones who are fighting or in the line of fire of missiles - while struggling to stay warm and regain hope. With much of the region covered in snow, at least the plant pathogens are asleep for now.

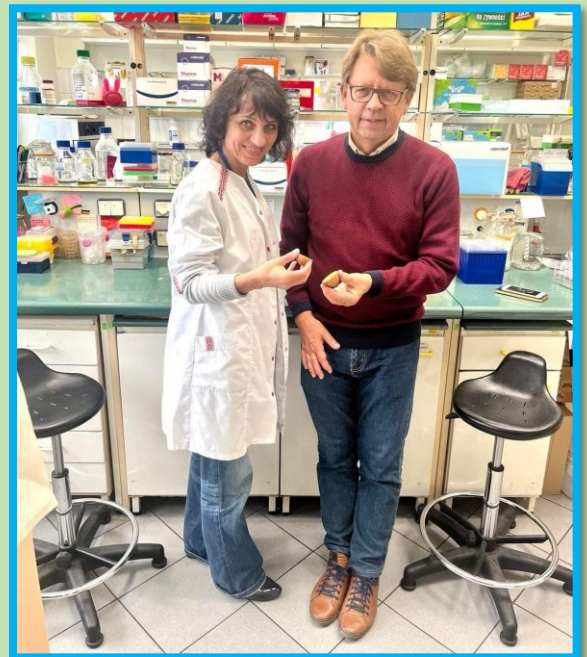
During November, Ukrainians marked the 90<sup>th</sup> anniversary of the "Holodomor", or Great Famine which saw the death of at least three million people over two years as the Soviet government under Josef Stalin seized food supplies and deported Ukrainians. The Anniversary was a timely reminder of the horrors of war and tyranny, and of the importance of making every effort to end conflict and contribute to world food security. As Winter embraces the northern hemisphere in its icy grip, the need for ISPP support through our Resilience Bursary remains urgent – if you wish to contribute, please go to this [link](#).

As the year ends, we thank all who have contributed to the Bursary support and to the ISPP and PPS Treasurers, Associate Professor Mathews Paret and Associate Professor Zbigniew Karolewski, respectively for keeping careful track of Bursary fundraising and expenditures.

This month we hear from Anhelina Kyrychenko, who is at the Institute of Biochemistry and Biophysics (IBB) of the Polish Academy of Sciences, Warsaw, Poland.

### **ANHELINA KYRYCHENKO**

My story is probably typical for all the scientists who have received support in Poland: the beginning of the war, evacuation from our hometowns, the collapse of all hopes and deep heartache, and, of course, the fear of the future and the desire to save our children from danger. I was forced to look for a way out of this situation and, to my great happiness, received a grant from the International Society for Plant Pathology (ISPP) via the Polish Phytopathological Society (PPS) fund and arrived in Poland with



Dr Anhelina Kyrychenko with Professor Jacek Hennig, head of the Laboratory of Plant Pathogenesis at the Institute of Biochemistry and Biophysics (IBB) of the Polish Academy of Sciences, Warsaw, Poland.

my youngest 15-year-old son. My eldest son (a medical intern) and husband (an officer of the Armed Forces of Ukraine) remained in Ukraine and are doing their civilian duty, bringing our victory over the enemy closer.

My internship started at the Institute of Biochemistry and Biophysics (IBB) of the Polish Academy of Sciences, in the Laboratory of Plant Pathogenesis led by Professor Jacek Hennig. The research team of the laboratory studies plant-virus interactions, a topic which has overlap to some extent with my experience in Ukraine, so it was very interesting for me to gain new knowledge and experience in this area. In addition, I had the opportunity to apply for a scholarship at the IBB and received a 6-months fellowship there. I am very grateful to Professor Hennig and his laboratory for the opportunity to gain new skills and experience and for their full support.

In Ukraine, before the Russian invasion, I worked as a head of the Plant Virology Laboratory, a senior research associate at the D. K. Zabolotny Institute of Microbiology and Virology, the National Academy of Sciences of Ukraine (NASU). In addition, I worked as an assistant professor at the National University of Kyiv-Mohyla Academy and was involved as a lecturer (General Virology Course) in postgraduate education programs at the Institute of Microbiology and Virology, NASU.

Being here in Poland, I keep in touch with my colleagues and students in Ukraine and I am grateful for this opportunity. We participated at the scientific conference of the Polish Phytopathological Society “A modern glance at plant pathology” (7-8 September, 2022) at Poznań, Poland and presented a poster report on the topic “Occurrence of cucumber mosaic virus and turnip mosaic virus in *Alliaria petiolata* in Ukraine”.

During an internship at the Laboratory of Plant Pathogenesis, I achieved several learning goals regarding the improvement of knowledge and skills on molecular cloning of DNA fragments, purification of plasmid DNA, transformation and growth of *Agrobacterium tumefaciens*, agrobacterium-mediated transformation of plants, and extraction of total proteins from agro infiltrated leaves. In addition to studying the general methods used in the host department, there was also an exchange of knowledge during seminars and research presentations. To summarise, I would like to say that besides the great experience of conducting scientific research, acquiring new skills and learning new concepts, I gained insight into the management of science in Poland that can help me a lot to apply obtained knowledge in a professional setting in the future. I want to thank the Polish Phytopathological Society for providing me with the chance to work in the Polish scientific Institute. I am grateful to Poland and its people for the strong support they have provided to our country and Ukrainian refugees. Thank you on behalf of all Ukrainians!



Dr Kyrychenko with Dr Małgorzata Lichočka at the Laboratory of Plant Pathogenesis IBB PAS.

## ICPP2023 - LYON SATELLITE EVENTS

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The ICPP2023 Organising Committee invites you to take a look at the rich program of satellite events that will take place the weekend of Saturday, August 19 to Sunday, August 20, 2023 prior to the ICPP congress. Twenty satellite events are now opened for registration and 3 will be private. The registration fees are attractive, especially if you also register for the ICPP (50% discount on satellites). The link to register is the following: <https://www.icpp2023.org/registration>. Stay tuned to our website for the latest updates on satellite events: <https://www.icpp2023.org/programme/satellite-events>

We hope to see many of you at our satellite events!

**The 4th European Conference on *Xylella fastidiosa*** will take place on Sunday August 20, 2023 (morning and afternoon). It is a cooperative event co-organised by European Food Safety Authority (EFSA) with European Research projects on *Xylella* and Euphresco network. Organiser: *Giuseppe Stancanelli, EFSA, Italy*.

**The OMGN2023: Oomycete Molecular Genetics Network Meeting** will take place from Saturday 19 to Sunday 20 August 2023 (two days). Oomycetes are a group of filamentous eukaryotic microorganisms widely present in natural environments, some of them including the main pathogenic species for plants, algae and animals. This international workshop will be devoted to the presentation of the most recent research on these organisms, aiming in particular at developing new control methods to limit their impact on agriculture and natural environments. The workshop will include sessions devoted to molecular mechanisms of oomycete pathogenicity, host resistance, evolution and population genomics, and innovations in control. *Chairs: Elodie Gaulin and Bernard Dumas, Toulouse University, UT3, France.*

### **Big Ideas in Agricultural Microbiome Science: A Community-based Interactive Workshop.**

1 day: Saturday August 19, 2023 (morning and afternoon).

Building upon the concept of a 'hackathon', we propose a microbiome 'thinkathon' with the goal to stimulate and create new ways of thinking about agricultural microbiome questions/hypotheses, experimental design, and data collection, analyses, and interpretations. The workshop will focus on advancing creative thinking through small-group breakout interactions in which participants will work collaboratively with provided microbiome experimental data, graphical summaries, and analyses to craft summary interpretations, and next-step hypotheses, analytics, and research objectives. Short invited talks and lightning talks from early-career scientists will set the stage for each step of the day, and teams will be challenged to synthesize and share the most creative, collaborative, and impactful outcomes to advance understanding and applications in agricultural microbiome science. Organized by the Agricultural Microbiomes Research Coordination Network (U.S. National Science Foundation-funded global research network). *Chairs: Linda Kinkel, University of Minnesota and JP Dundore-Arias, California State University-Monterey Bay, USA.*

### **Biological induced resistance in plants against pathogens using beneficial microbes and natural substances.**

2 days: Saturday 19 to Sunday 20 August 2023.

Induced immunity and resistance in plants against pathogens using beneficial microbes (fungi, bacteria, virus) and natural substances (bacterial metabolites or extracts, plant metabolites or extracts, bio-sourced compounds, etc.) is an ecofriendly biological control strategy promoting plant health, that fits with the current needs for sustainable agriculture and agroecology. The proposed symposium will focus on the recent advances in this area and will target all scientists and actors working or interested by such a concept. Particular attention will be addressed to the recent discoveries regarding crossprotection phenomenon against pathogenic microorganisms threatening plant health and crop production and to the mechanisms underlying plant defense elicitation and priming. The intrinsic and the extrinsic factors affecting the efficacy, the expression and the sustainability of induced immunity in field conditions will also be considered. The symposium will be organized in several specific sessions (orals, posters, and invited keynotes) dedicated to these topics and related issues. A round table as well as a visit of field trials could also be programmed in the framework of the event. The proposed symposium will be an opportunity to the researchers, agronomists, stakeholders, and industrials concerned by plant induced resistance and more generally by the agroecological transition in agriculture, to share their recent knowledge and future challenges regarding this topic. Organized by SFP, French Phytopathological Society. *Chairs: Ali Siab, Junia, Lille; Emmanuelle Vigne and Olivier Lemaire INRAE Colmar, France.*

### **Biology and paleovirology of the Caulimoviridae**

1.5 days: Saturday, August 19 morning and afternoon and Sunday, August 20 morning, 2023.

The Caulimoviridae is a family of plant-infecting viruses in the order Ortervirales, which in common with retroviruses, incorporates a reverse-transcription step in the replication cycle. Members of the Caulimoviridae are found throughout the world and infect a wide range of monocot and dicot plants, causing economically important diseases such as rice tungro and cacao swollen shoot. Cauliflower mosaic virus, the type species of the Caulimoviridae, has provided an exceptional model system to investigate all manner of biochemical pathways in plants, as well as fundamental aspects of virus replication, virion structure, intercellular movement and vector transmission. Endogenous viral elements (EVEs) that derive from caulimovirids are widespread in the genomes of tracheophyte plants, and some remain replication-competent and can cause spontaneous infections through activation by biotic or abiotic stresses. However, the majority of caulimovirid EVEs are replication-defective and can constitute a very large proportion of the plant genome. How these EVEs may benefit the plant is still a

matter of conjecture and is a very active area of research. Caulimovirid EVEs also act as molecular fossils and can be used to infer the evolution of plant viruses over unprecedented timescales. This 1.5 day symposium will offer a unique opportunity to present the latest advances in research on the Caulimoviridae and to discuss future research directions and collaborations. *Chairs : Pierre Yves Teycheney - CIRAD-Bios -Saint Pierre - Ile de la Réunion – France ; Andrew Geering - Centre for Horticultural Science - Queensland Alliance for Agriculture and Food Innovation - The University of Queensland – Australia.*

### **Forest pathology field trip**

1 day: Saturday August 19, 2023 (morning and afternoon).

Forest pathology field trip in the region of Aix-les-Bains to see forest pathogens such as Chalara ash dieback, chestnut blight, many Phytophthora problems, rusts of forest trees, etc. Sponsored by the ISPP “Forest Pathology” subject matter committee. *Organiser: Pascal Frey*

### **Fusarium wilt disease of banana: how to tackle a pandemic?**

1 day: Saturday, August 19, morning and afternoon, 2023.

Fusarium wilt of banana (FWB) caused by Tropical Race 4 is a major threat to banana production. The commonest Cavendish banana varieties are very susceptible to this pathogen. The satellite comprises sessions that address the current distribution and impact of FWB, the biology of the causal fungi, novel control methods from quarantine strategies to gene silencing, new approaches in genetics, genomics and breeding, and an update on GM strategies. The final session underscores the importance of global alliances and partnerships. The meeting is followed by a social event and a dinner sponsored by Chiquita. *Chairs: Prof. Dr. André Drenth, Centre for Horticultural Science - The University of Queensland, BRISBANE, Australia; Prof Dr Gert HJ Kema, Wageningen University and Research, The Netherlands.*

### **Harnessing Culture Collections for Improved Plant Health**

0.5 day: Sunday, August 20, morning, 2023.

This workshop will identify and explore the diversity of culture collections and how they are being used to improve plant health. Living microbial collections can play a pivotal role in untangling community level interactions and contribute basic knowledge that can be translated in real world solutions. Workshop presentations will discuss proper maintenance and curation, successful strategies and tools to further plant health research and identify critical research areas: increasing plant growth within changing environments, disease diagnostics, reducing biotic and abiotic stresses, and microbiome manipulation. The fundamental knowledge gained with this session will support and enhance efforts that are underway to broaden and strengthen U.S. and European collection communities and their networks. Sponsored by: U.S. Culture Collections Network (<https://usccn.org/>). *Chairs: Matthew Ryan, CABI, UK; Neba Potnis, Auburn University, USA; Rick Bennett, University of Kentucky, USA; Dusti Gallagher, U.S. Culture Collections Network.*

### **High-throughput sequencing in plant virology: from discovery to diagnostics**

1 day: Sunday August 20, morning and afternoon, 2023.

High-throughput sequencing (HTS) technologies have revolutionized plant virus research and diagnostics by accelerating the discovery of new viruses and by providing a sensitive untargeted approach for the detection of viruses. The latter, together with high data-generation potential of HTS, enables discovery of new and emerging viruses from diverse hosts, archived or ancient samples, and untargeted virus detection in diverse matrices, as well as research on a broad range of topics, such as plant virus epidemiology, diversity and evolution. Many new plant virus discoveries, increased availability of sequence data, and a lagging biological characterization of HTS-based findings call for a broad consideration on harmonization of sequencing and data analysis approaches, as well as

the interpretation of the results from the scientific and regulatory perspective. During this satellite meeting, different aspects of applying HTS in plant virology will be addressed and discussed. Topics will include: discovery and detection of new and emerging viruses; virus diversity, epidemiology, and evolution studies; development of virus detection and identification protocols and validation of HTS-based tests for plant virus diagnostics. *Chairs: Maja Ravnikar, National Institute of Biology (NIB), Ljubljana, Slovenia; Denis Kutnjak, National Institute of Biology (NIB), Ljubljana, Slovenia; Giovani Baldissera, Euphresco, Paris, France; Adrian Fox, Fera Science Ltd., York, UK; Marleen Botermans, National Plant Protection Organization of the Netherlands (NVWA), Wageningen, the Netherlands; Carla Oplaat, National Plant Protection Organization of the Netherlands (NVWA), Wageningen, the Netherlands; Dimitre Mollov, USDA ARS Horticultural Crops Disease and Pest Management Research Unit, USA.*

### **How to combine remote sensing with epidemiological modelling to improve plant disease management?**

2 days, from Saturday 19 to Sunday 20 of August 2023.

This satellite meeting aims to foster links between the communities of researchers modelling plant disease and those interested in remote sensing. Indeed, the latter do not tend to have a background in disease modelling while the former are sometimes skilled data scientists but, typically, have limited understanding of the opportunities and challenges involved in interpreting remotely sensed information. Bringing these two communities together will clearly stimulate further developments in both fields. A more concrete focus will be on how remote sensing approaches can contribute to an enduring preoccupation of disease modellers, calculating the basic reproduction number,  $R_0$ . Sponsored by: British Society for Plant Pathology, INRAE, International Society for Plant Pathology - Epidemiology Committee. *Chairs: Alexey Mikaberidze (Reading, UK); Carlos Camino (EC JRC, Italy); Frédéric Fabre (INRAE Bordeaux, France); Frédéric Hamelin (Institut Agro Rennes-Angers, France); Nik Cunniffe (Cambridge, UK); Pieter Beck (EC JRC, Italy); Stephen Parnell (Salford, UK); Suzanne Touzeau (INRAE, Sophia Antipolis, France).*

### **How to Write Winning Grant Proposals**

0.5 day: Sunday, August 20, afternoon, 2023.

Writing grants can be very challenging for starters to figure out, and it is a competence that many do not have an opportunity to learn while in graduate school. This workshop will be particularly beneficial to early career professionals and graduate students. Areas to be covered will include but not limited to good grantsmanship, international opportunities, logic models, impact statements, effective communication of content and communication of outcomes of winning proposals. At the end of the workshop, participants are expected to be more knowledgeable on: how to find the appropriate grants to apply to, how to use logic model to develop a blueprint for grant proposals, how to tell a good story, components to a successful proposal, efficient budgeting and project evaluation/management tools. This workshop will involve lots of creative activities like using the GOPP to create a proposal concept, writing impact statements, filling in NIFA and NSF budget forms. Sponsored by The Phytopathological Society of Nigeria (PSN). *Chair: Dr Sylvester O. Aigbe, Department of Crop Science, Ambrose Alli University Ekpoma, Nigeria (Visiting Scientist\_ CAES-CT.gov, The Connecticut Agricultural Experiment Station Department of Plant Pathology and Ecology, New Haven, USA).*

### **Nuts and Bolts for Plant Diseases Image Classification, an Artificial Intelligence Tool**

1 day: Sunday August 20, morning and afternoon, 2023.

Image classification tools that uses Artificial Intelligence is increasingly becoming relevant as a new approach for field detection of plant health issues. This session will cover the basics of image classification approaches by an industry presenter (Statlogic) followed by discussing real-world applications developed or in the process of development. The session will also review some of the new open-source image classification programs. This session is expected to be a hybrid of educational as well as research driven presentations and will shed light on

opportunities in utilizing images for developing Artificial Intelligence tools in plant pathology. *Chair: Mathews Paret, University of Florida, USA.*

### **Pectobacteriaceae: soft rot pathogenesis and symbiosis**

2 days: Saturday 19 to Sunday 20 August 2023.

Pectinolytic bacteria are pathogens that cause soft rot symptoms in economically important crops in different countries. Bacteria belong mostly to the genera *Pectobacterium* and *Dickeya*. The objective of this satellite is to bring together the research community of the field to discuss recent advances and future researches on the following themes: detection of these pathogens; crops protection and resistance; ecology of pathogens: the dynamics of infection and reservoir of pathogens; molecular interaction: pathogens their hosts and the environment. *Chairs: Florence Hommais (1), Marie-Anne Barny (2), Erwan Gueguen (1), Jan Van der Wolf (3), Zahar Haichar (1), Denis Faure (4), Guy Condemine (1) Sylvie Reverchon (1).*

(1) UMR 5240 Microbiologie Adaptation Pathogénie, Université de Lyon, Université Claude Bernard Lyon 1, Insa de Lyon, CNRS, France

(2) UMR S-U113 Institut d'Ecologie et des Sciences de l'Environnement de Paris, Sorbonne Université, CNRS 7618 - IRD 242 - INRAE 1392 - UNIV. DE PARIS 113 - UNIV. PARIS EST CRETEIL 7618, France

(3) Wageningen University & Research, The Netherlands

(4) Institute for Integrative Biology of the Cell (I2BC), CNRS, France

### **Phytobiomes Research for Plant Health**

0.5 day: Sunday, August 20, afternoon, 2023.

Having healthy plants is key to providing food security for the 9.8 billion people expected by 2050. But crops are facing many challenges, among them climate change and an increased exposure to biotic and abiotic stressors, such as pests, poor soil quality, low water availability and excessive heat. In order to make agriculture more productive and sustainable, we need to study plants in their biological, physical and environmental contexts, i.e. the “Phytobiome”. Phytobiomes research – a new, cross-cutting, multidisciplinary, holistic approach – focuses on the complex interactions between plants, microorganisms, soils, climate, environment, and management practices. In this workshop, we will showcase examples on how phytobiomes science can provide solutions to produce healthy plants to ensure food security for future generations. Sponsored by the International Alliance for Phytobiomes Research, <https://phytobiomesalliance.org/>. *Chairs: Kellye Eversole, Executive Director, International Alliance for Phytobiomes Research; Matthew Ryan, Curator, Genetic Resource Collection, CABI, UK.*

### **Plant Health starts with Seed Health**

1 day: Saturday August 19, 2023 (morning and afternoon).

Healthy seeds maximize chances for healthy plants and good harvests, particularly for vegetables as any damage leads to reduced yield and fruit marketability. Vegetable seed industry is active through the International Seed Health Initiative (ISHI), driven by the International Seed Federation (ISF) for developing and validating standard protocols for disease detection. Recent molecular techniques development helped hastening tests and increased sensitivity. Result biological relevance needs to be kept in mind as detection of pathogen particles does not necessarily lead to expressed diseases. Overview of ISF, ISHI and main methods will be presented here. A roundtable on topics like biological relevance, seed transmission and sensitivity of detection methods is part of the program. Sponsored by the International Seed Federation (ISF), <https://worldseed.org/>. *Chairs: Rose Souza Richards, Joyce Woudenberg, Ludivine Thomas, Bénédicte Lebas, International Seed Federation (ISF).*



### **Powdery mildew fungi: phylogenetics, phylogenomics, and molecular host-pathogen interactions**

0.5 day: Sunday, August 20, afternoon, 2023.

Powdery mildew fungi (Erysiphaceae) are common obligate biotrophic pathogens of over 10,000 plant species. Some cause economically important diseases of many agricultural and horticultural crops. Currently, there are more than 30 genome assemblies available from over 15 species representing eight powdery mildew genera. The Symposium will focus on the use of these genomic resources and other molecular data to better understand the identification, phylogeny, evolution, and host range expansions of powdery mildew fungi, and their interactions with host plant tissues at molecular level. *Chairs: Levente Kiss (University of Southern Queensland, Australia) and Stefan Kusch (RWTH Aachen University, Germany)*

### **Rice diseases**

1 day: Sunday August 20, morning and afternoon, 2023.

Rice is an important staple crop and critical for global food security. Both endemic and emerging pathogens greatly affect rice production and cause huge yield losses. This workshop aims at gathering people involved in research on rice pathogens and on their interactions with their host plant, and on developing control methods of rice diseases. It will provide a unique opportunity to get a worldwide overview of current rice diseases, gain information on emerging diseases, update knowledge in cutting-edge research topics and establish collaborations with a large community. *Chairs: Guo-Liang Wang, Department of Plant Pathology, Ohio State University, USA; Didier Tharreau, Plant Health Institute of Montpellier, CIRAD, Montpellier University, France.*

### **Soil health and soilborne plant diseases**

1 day: Sunday August 20, morning and afternoon, 2023.

Root rot diseases can be difficult to manage due to the broad host range and long-lived survival structures of the pathogens. Fungicides, crop genetic resistance, and cultural practices can be effective, but educating producers and implementation of the best practices at broad scales is difficult. In this workshop we will feature basic and applied work on soil health as it is related to plant diseases and how to communicate with stakeholders to implement best practices on the farm. Research presentations will be followed by interactive small group discussions where participants will exchange information to overcome research and outreach barriers. *Chairs: Dr. Mary Burrows, Montana State University; Dr Uta McKehty, Montana State University; Dr Christophe Le May, IGEPP, INRAE, Institut Agro, Univ Rennes ; Rennes, France.*

### **Tn-Seq to reveal microbial lifestyles along plant interaction processes**

0.5 day: Sunday, August 20, afternoon, 2023.

Transposon-sequencing (Tn-Seq) emerged as a powerful molecular approach to investigate behavior of plant pathogens and symbionts along host colonization processes. This workshop will illustrate different ways to use Tn-Seq and the strengths and limits of the Tn-mutant screening approach in microbes, including bacteria and eucaryotes. Sponsored by the French environmental genomics network (GDR GE). *Chairs: Denis Faure, Institute for integrative biology of the cell, CNRS-CEA-University of Paris-Saclay, Gif-sur-Yvette, France; Adam Deutschbauer, Department of Plant and Microbial Biology, UC Berkeley, CA, USA*

### **Understanding the ecology and evolution of bacterial wilt disease in the plant microbiomes**

1 day: Sunday August 20, morning and afternoon, 2023.

*Ralstonia solanacearum* is one of the most destructive bacterial plant pathogens worldwide, causing bacterial wilt and major crop losses, especially in the solanaceous plant family. While a solid understanding of the molecular interactions between the pathogen and crop plants have been established, these interactions are poorly understood in more complex

rhizosphere microbiomes. Moreover, while increasing evidence suggests that plant-pathogen interactions can evolve rapidly, this is seldom recognised in the context of plant pathogen control. In this session, we will bring together experts from microbiome research, systems biology, plant pathology, experimental evolution and plant pathogen biocontrol to build a multidisciplinary view of the ecology and evolution of *R. solanacearum* in rhizosphere microbiomes. We aim to produce a holistic summary of how ecological and evolutionary information could be harnessed for bacterial wilt biocontrol and to identify key environmental drivers associated with disease outbreaks. We also welcome researchers interested in the *R. solanacearum* pangenome to better understand its genetic diversity in space and time. The satellite event will be accompanied by a special issue on the topic for example in FEMS Microbiology Ecology edited by Ville Friman (current Editor) and other organizers. *Chairs: Dr. Ville-Petri Friman, Dr. Andrea Harper, and Dr. Sara Franco Ortega, University of York, UK.*

### **Three private events will complete the satellite program**

#### **5<sup>th</sup> annual EURL workshop for pests of plants on bacteria: taxonomy and diagnostics in phytobacteriology**

Saturday, August 19, morning and afternoon, 2023.

The European Union Reference Laboratory (EURL) for pests of plants on bacteria was established in 2019. This is an European Union initiative that aims to achieve an overall high level of diagnostics in bacteriology at National Reference Laboratories, primarily across the Member States. The main EURL activities encompass the organisation of proficiency tests (PT) in order to assess the diagnostic competence of the laboratories. Additionally, test performance studies (TPS) and studies to evaluate the suitability of critical reagents in diagnostic tests are annually included. The focus of the EURL activities is on bacteria belonging to the EU priority pests or listed as EU quarantine pests, including *Xylella fastidiosa*, *Ralstonia solanacearum* species complex, *Xanthomonas citri* pv. *citri* and ‘*Candidatus Liberibacter*’ on Citrus, *Curtobacterium flaccumfaciens* pv. *flaccumfaciens*, *Pantoea stewartii* subsp. *stewartii* etc. The 5th EURL Workshop aims to address several current issues and recent developments in the field of plant bacteriology, with the focus on taxonomy and diagnostics. Additionally, during this Workshop the activities and results obtained in TPSs and PTs between September 2022-August 2023 will be presented and the priorities to be given in the Work Program 2024-2025 will be highlighted. Should you have any questions related to the content of the 5th Annual EURL Workshop for Pests of Plants on Bacteria or administrative/practical issues please contact the EURL Bacteriology at [EURL-Bacteriology@nvwa.nl](mailto:EURL-Bacteriology@nvwa.nl). *Chairs: Maria Bergsma-Vlami, Netherlands Institute for Vectors, Invasive plants and Plant health (NIVIP-NVWA, Bacteriology group), Wageningen, The Netherlands; Johan van Vaerenbergh, Flanders Research Institute for Agriculture, Fisheries and Food (ILVO, Plant Sciences, Bacteriology group), Mellebeke, Belgium; Stefania Loreti,*

*CREA-Research Centre for Plant Protection and Certification (CREA-DC, Laboratory of Phytopathology DIALAB, Bacteriology group), Rome, Italy; Tanja Dreo National Institute of Biology (NIB, Bacteriology and Metrology unit), Ljubljana, Slovenia.*

#### **Global Plant Health Assessment Workshop (GPHA)**

Sunday, August 20, morning and afternoon, 2023.

This workshop will allow the GPHA community to discuss and decide on further steps for the project. These steps will involve elements of conclusions, recommendations, and perspectives. Perspectives can be according to research, education, and policy. Specifically, the workshop will aim to identify organisation and timeline (1) to produce and disseminate conclusions and recommendations from the GPHA results and (2) for future activities within the GPHA project. ISPP- International Year of Plant Health.

*Organiser: Paul Esker, Department of Plant Pathology, PennState University, USA. Co-organisers: Laetitia Willocquet, INRAe, France; Sonam Sab and Manjari Singh, GB Pant University, India;*

Federica Bové, University of Piacenza, Italy; Serge Savary, GBPant University, India and UC Davis, USA.

### ISPP Executive Committee

1.5 days: Saturday, August 19 morning and afternoon and Sunday, August 20 morning, 2023.



#### The Flower tree of Lyon, France.

What does this giant bouquet represent? The work has 85 original flowers and reaches a height of 6 meters. According to the Korean artist Choi Jeong Hwa, the bouquet "summons by its imputrescible dimension the idea of sublime transience of nature, the fragility and the extreme endangerment of environments by human activity". Clearly, the artificial side symbolizes eternal flowers in the face of climatic dangers.

## **SUMMARY OF THE WORLDWIDE AVAILABLE CROP DISEASE RISK SIMULATION STUDIES THAT WERE DRIVEN BY CLIMATE CHANGE SCENARIOS AND PUBLISHED DURING THE PAST 20 YEARS**

A review paper by Peter Juroszek *et al.* titled "Summary of the worldwide available crop disease risk simulation studies that were driven by climate change scenarios and published during the past 20 years" was published on 5 September 2022 by *Plant Pathology* (Vol. 71, pp. 1815-1838). The abstract is as follows:-

Here, published crop disease risk simulations are summarized, which were driven by climate change scenarios on a timescale terminating between 2001 and 2100. Thirty different agricultural and horticultural crops were specifically considered. Wheat diseases (mainly leaf rust) were most often simulated, followed by rice diseases (mainly leaf blast), grapevine diseases (mainly downy mildew) and potato diseases (mainly late blight). Most simulations suggest that within the projection period simulated, crop disease risk will more often increase (86 simulations) than decrease (45 simulations) or remain similar (12 simulations). The majority of crop disease risk simulations focus on Europe and Brazil. For example, there is agreement across crop disease risk simulations that in Europe the risk of leaf rust of wheat will increase. In other cases, there is disagreement across crop disease risk simulations, for example, due to contemporary climatic differences of locations. Therefore, it is risky to extrapolate results across locations. Mitigation and adaptation methods should be more often integrated in the crop disease risk simulations in order to inform about potential methods to reduce disease risk in future.

[Read paper.](#)

## SECRETION SECRETS REVEALED: PATHOGEN EFFECTOR CHARACTERISATION FOR A DEVASTATING PLANT DISEASE

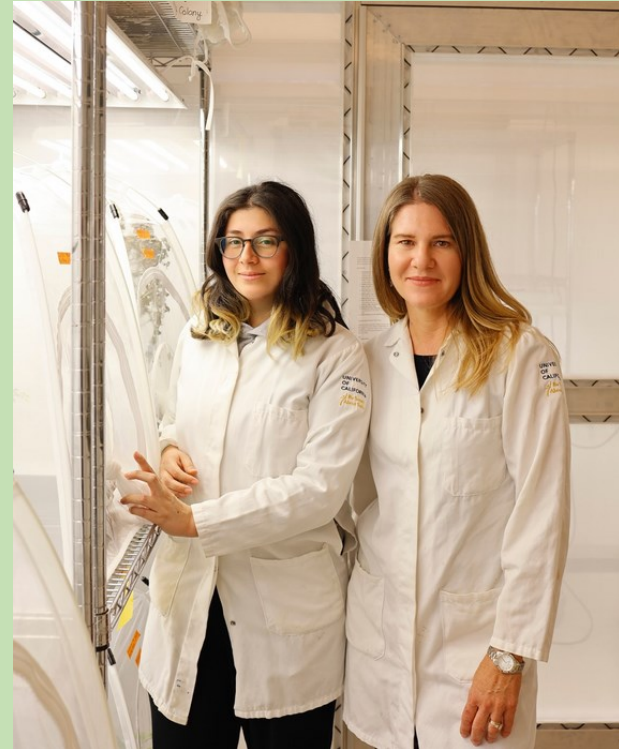
AMERICAN PHYTOPATHOLOGICAL SOCIETY NEWS RELEASE, 22 NOVEMBER 2022

Sometimes the most niche plant pathogens pack the greatest punch. Such is the case for the Florida citrus industry, which has seen a 70% decline in its orange production since the introduction of Huanglongbing (citrus greening) in 2005. This disease is caused by the bacteria *Candidatus Liberibacter asiaticus*, which spreads via a flying insect—unlike most bacterial plant pathogens. When the insect feeds on the sugary sap of a plant, it deposits the bacteria into the veins of the plant, directly into the phloem, which allows the bacteria to follow this transport highway throughout the plant.

A close relative of the citrus greening pathogen, *Candidatus Liberibacter solanacearum* (CLso), is a newly emerging pathogen of tomato and potato. As this bacterium cannot survive outside of its hosts, very little is known about it, including how it causes disease. A recent study led by Paola Reyes Caldas, of the University of California, Davis, has discovered and characterised secreted proteins from the pathogen CLso. These proteins, called effectors, offer clues into the manipulation tactics this bacterium uses to subdue its plant host.

Newly published in [Molecular Plant-Microbe Interactions](#), the study found that these effectors can be present in both the plant and insect host. Once inside the plant, these effectors can target various parts of the cell such as the iconic chloroplast, which are critical for the plant to perform photosynthesis. Additionally, these effectors are mobile in that they can travel from one plant cell to another. Corresponding author Gitta Coaker comments, “These effectors can also move from cell to cell, which could explain how *Liberibacter* can manipulate the plant while remaining restricted to the phloem. Unlike effectors from culturable leaf colonising bacteria, the majority of *Liberibacter* effectors do not suppress plant immune responses, indicating that they possess unique activities.”

Whether these unique activities alter the phloem environment or insect attractiveness to facilitate pathogen spread remains to be seen, but this research offers an exciting starting point to unravelling this complex disease. Once targets of these effectors are identified, genetically engineering these important crops to prevent manipulation could be a fruitful solution to managing these diseases.



Dr. Gitta Coaker (right) and Dr. Paola Reyes Caldas standing next to insect cages containing tomato plants naturally infected with *Candidatus Liberibacter solanacearum* (Credit: Dr. Gitta Coaker and Dr. Paola Reyes Caldas).

## BREAKTHROUGH IN PROTECTING BANANAS FROM PANAMA DISEASE

UNIVERSITY OF EXETER RESEARCH NEWS, 21 OCTOBER 2022

Bananas are amongst the most popular fruits eaten world-wide. They are grown and eaten locally, so providing food for almost half a billion people, and banana exports generate precious income.

In the 1950s, Panama disease, caused by the fungus *Fusarium oxysporum cubense* Race 1, decimated the world's bananas supply. This disaster was overcome by the introduction of a new Cavendish variety bananas. However, a new race of the fungus, known as Tropical Race 4, recently swept across the continents and through the Cavendish banana plantations. This new Panama disease threat is of particular significance as Cavendish bananas account for about 40% of world production and more than 90% of all exports. All efforts to control the disease in Cavendish bananas have, so far, failed.

In this new study, reported in the journal [PLOS Pathogens](#), University of Exeter scientists provide hope that Panama disease can be controlled by a particular class of anti-fungal chemistries (fungicides).

Funded by the BBSRC Global Food Systems initiative (GFS), an Exeter team led by Professor Steinberg and Professor Sarah Gurr used a multi-disciplinary approach, to better understand why chemical control of Panama disease had failed. By combining expertise in cell and molecular biology, bioinformatics and plant pathology, the team revealed that all major classes of fungicides do not work against this troublesome pathogen and provide insight for the molecular reason behind this "resistance".

Guided by this understanding, the research team discovered that a more specialised class of anti-fungal chemistries, not previously used, suppress Panama disease and maintain banana plant health in the presence of the pathogen. This discovery opens new avenues to develop efficient control strategies and

provides a significant step forwards in the fight to protect this valuable crop.

Professor Steinberg, who led the molecular and cellular aspects of the work, said: "Bananas are Britain's favourite fruit and Panama disease may 'wipe' them off the supermarket shelves. On top, millions of people in producer countries live on bananas. Providing an important step towards safeguarding bananas from Panama disease gives me great pride."

Professor Sarah Gurr, the plant pathology expert who led all work on banana infection and pathogen cultivation, said: "Our success is due to an enormous amount of dedicated work over several years with co-workers with hugely disparate skills. We are highly delighted and excited by the outcome of our work and by the glimmer of hope that the beloved banana may remain as part of our daily diet."

Professor Dan Bebber, who was not involved in the study but heads the Exeter Global Food Security programme, said: "This work has rather excitingly opened the door to development of safe and effective ways of protecting the UK's favourite fruit by demonstrating good levels of disease control with lesser known antifungals. It also confirms that basic research has the potential to provide answers to pressing challenges in global food security."

The University of Exeter realises the potential social impact of this study. Dr Tori Hammond, from Innovation, Impact and Business at the University of Exeter, said: "Prof Steinberg and Prof Gurr's work has resulted in an exciting and innovative technology breaking out of the lab and towards commercialisation. The potential impact of this technology on the global bioeconomy is incredibly significant."

# UNDERSTANDING THE ENVIRONMENTAL MICROBIOME USING CONFOCAL MICROSCOPY

AGRILIFE TODAY, 29 NOVEMBER 2022

Confocal technology is one of the most important advances in optical microscopy, and many disciplines within Texas A&M AgriLife and other parts of The Texas A&M University System are discovering it can also be a game-changer in their research.

Brian Shaw, a professor in the Department of Plant Pathology and Microbiology, PLPM, at the Texas A&M College of Agriculture and Life Sciences is an expert in confocal microscopy. He not only applies this state-of-the-art technology in his own research, but also encourages undergraduate and graduate students, as well as other researchers, to use it to advance their own scientific efforts.



Brian Shaw, Ph.D., using the confocal microscope that allows him to employ various imaging modalities in his research (Photo credit: Michael Miller, Texas A&M AgriLife).

## WHAT IS CONFOCAL MICROSCOPY?

“Confocal microscopy offers several advantages over conventional microscopy, including the ability to control depth of field and to reduce or eliminate out-of-focus light in image formation on the focal plane,” Shaw explains.

“It also gives you the ability to work with living cells and see the changes they make in real time, as well as to collect serial sections from thick specimens,” he said. “Additionally, it can produce an almost 3-D image of the cell, allowing you to view it from various perspectives.”

Shaw’s primary confocal microscope, which allows for a wide range of imaging modalities, is located in the Plant Pathology and Microbiology Building on the Texas A&M campus.

It is an Olympus FV3000 confocal laser-scanning microscope with four detectors and six laser lines, which allow for simultaneous imaging of four-color channels of almost any fluorophore. It is fully motorized with autofocus, allowing for time-lapsed imaging for hours without losing focus. The microscope’s precision motorized stage makes it possible for multiple-point time-lapse of various specimens simultaneously.

## CONFOCAL MICROSCOPY AND DETERMINING PATHOGENIC INFECTION

According to research in the Multidisciplinary Journal of Microbial Ecology, the official Journal of the International Society for Microbial Ecology, more than 80% of crop diseases are caused by fungi or fungus-like pathogens. These diseases lead to billions of dollars in crop losses and threaten food security.

Shaw said much of the research he and his team do relates to determining the cellular machinery involved in the growth and development of fungi and how fungal pathogens work.

“We are investigating surface characteristics of fungal spores and how they influence spore dispersal,” he said. “The fungal spore is the dormant cell that these organisms use to disperse across distance and through time.”

Shaw said fungi require polarized hyphal growth to have an impact on plants and humans, so understanding how hyphae are made is a fundamental concern. A hypha is the basic unit of a filamentous fungus and typically consists of a chain of elongated cells that expand at the apex of the tip cell. The elongated, thread-like cells grow only at their highly polarized apex and their growth is characterized by the initial establishment of one growth site, which is followed by its continuous maintenance.

“Our lab examines the temporal and spatial dynamics of cytoskeletal components during the growth and development of fungal hyphae,” he said. “Using the confocal microscope, we found that the spores of the important corn pathogen, *Colletotrichum graminicola*, are asymmetric. And these spores can only attach to their new host on one face of the spore.”

Shaw said since attachment to their new host is necessary to begin the disease cycle in corn, this discovery identifies a new and essential target to disrupt fungal disease in corn.

“With the help of this higher-resolution, almost 3-D imagery, we were able to infer a correlation between the site of attachment and the site of infection by the fungal pathogen,” he said. “Confocal microscopy allows us to see these structures and their components at a level of detail not previously available. Now we can get a better picture of how fungi grow and identify the hyphae of specific fungi and their role in disease initiation.”

[Read more.](#)

## A NEW SPECIES OF MYCODIPLOSIS GALL MIDGE FEEDING ON MYRTLE RUST

A paper by Peter Kolesik *et al.* titled “A new species of *Mycodiplosis* gall midge (Diptera: Cecidomyiidae) feeding on myrtle rust *Austropuccinia psidii*” was published on 22 June 2022 by *New Zealand Entomologist* (Vol. 44, pp. 121-129). The abstract is as follows:-

Larvae of an undescribed gall midge were found feeding on the rust fungus *Austropuccinia psidii* that was infecting leaves of trees *Lophomyrtus bullata*, *Lophomyrtus obcordata* and *Syzygium jambos* (all Myrtaceae) in New Zealand. The new species belongs to a cosmopolitan, rust- and mildew-feeding genus *Mycodiplosis* (Diptera: Cecidomyiidae). The description of *Mycodiplosis constricta* sp. nov. includes morphology of adults, pupa and larva, and the sequence of a segment of the Cytochrome Oxidase unit I mitochondrial gene. The new species differs from its congeners in an unusual aedeagus and a peculiar male hypoproct. The aedeagus is rounded apically and strongly constricted subapically, bearing subapical setulose sensoria. The hypoproctal lobes are long and narrow, dorsally they are covered with long apical setulae, ventrally they are bare, each lobe bearing a pair of setae of which one is placed apically, the other subapically. The currently known geographical distribution of the new species is confined to the North Island of New Zealand. While it is likely that larvae of the new species decrease numbers of viable uredinia of *Austropuccinia psidii*, the exact impact of the new species on the population dynamics of the fungal host as a biological control agent and/or a transmission vector remain to be determined.

[Read paper.](#)

## VECTOR ACQUISITION AND CO- INOCULATION OF TWO PLANT VIRUSES

A paper by Autumn A. McLaughlin *et al.* titled “Vector acquisition and co-inoculation of two plant viruses influences transmission, infection, and replication in new hosts” was published on 27 November 2022 by *Scientific Reports* (Vol. 12, 20355). The abstract is as follows:-

This study investigated the role of vector acquisition and transmission on the propagation of single and co-infections of tomato yellow leaf curl virus (TYLCV) and tomato mottle virus (ToMoV) (Family: Geminiviridae, Genus: Begomovirus) by the whitefly vector *Bemisia tabaci* MEAM1 (Gennadius) in tomato. The aim of this research was to determine if the manner in which viruses are co-acquired and co-transmitted changes the probability of acquisition, transmission and new host infections. Whiteflies acquired virus by feeding on singly infected plants, co-infected plants, or by sequential feeding on singly infected plants. Viral titers were also quantified by qPCR in vector cohorts, in artificial diet, and plants after exposure to viruliferous vectors. Differences in transmission, infection status of plants, and titers of TYLCV and ToMoV were observed among treatments. All vector cohorts acquired both viruses, but co-acquisition/co-inoculation generally reduced transmission of both viruses as single and mixed infections. Co-inoculation of viruses by the vector also altered virus accumulation in plants regardless of whether one or both viruses were propagated in new hosts. These findings highlight the complex nature of vector-virus-plant interactions that influence the spread and replication of viruses as single and co-infections.

[Read paper.](#)



## CURRENT VACANCIES

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### **Emerging Fungal and/or Phytophthora Plant Disease Population Genomicist - NC State**

We seek a solution-driven research scholar with expertise on plant pathogenic oomycetes including *Phytophthora* species and fungi. They will conduct cutting-edge science to track emerging plant pathogenic *Phytophthora* and fungi that can be used by decision-makers to improve local and global efforts to manage emerging pathogens that threaten crop production and food security. Examples of research include population genomics using modern high-throughput sequencing methods (e.g., long-read, rad-seq, pen-seq, single cell, etc.) sequencing to track outbreak strains, understand centers of origins, migrations, and sources of plant diseases, analytics of spatially explicit population genomics datasets to predict transmission pathways, and deployment of rapid response strategies to detect and limit potential damage by emerging threats. Applicants with a history of working across boundaries using population genomics datasets with plant disease epidemiologists and spatial modelers is important. Approaches that leverage translation to stakeholders at the local, national and international levels are especially important.

This position is Open rank and part of the Emerging Plant Diseases and Global Food Security Cluster. Individual will participate in teams that help develop proposals to advance interdisciplinary research in emerging plant diseases is expected (NSF Predictive Intelligence for Pandemic Preparedness Phase 2 grant anticipated submission fall 2023). The successful candidate will also become part of the integrated core team of the cluster that is part of Plant Science Initiative at NC State. Closing date: 1 January 2023. To apply go to: <https://jobs.ncsu.edu/postings/172923>

### **Assistant/Associate Professor of Plant Pathology at Louisiana State University**

The Department of Plant Pathology and Crop Physiology, Baton Rouge, Louisiana State University is seeking an Assistant/Associate Professor of Plant Pathology. This is a full-time 12-month, tenure-track position with an appointment of 70% research, 20% extension, and 10% teaching, focused on the biology, etiology and management of sugarcane diseases. The successful candidate is expected to develop a strong and innovative research program for managing sugarcane diseases and to develop their own area of specialisation within plant pathology. The application deadline is 14 December 2022 or until a suitable candidate is identified. Apply [online](#) by attaching files containing a letter of application, curriculum vita, official university transcripts, three letters of reference and a one-page statement each on research, extension, teaching and how you would address Diversity, Equity, and Inclusivity in your academic mission. More details about the position is available in the [PDF](#).

### **Assistant Professor of Plant Pathology at the University of California, Davis**

The Department of Plant Pathology in the College of Agricultural and Environmental Sciences at the University of California, Davis is recruiting an Assistant Professor of Plant Pathology with an emphasis in plant virology. This is an academic year (9-month), tenure track Assistant Professor position, with responsibilities for research, teaching, mentoring and service, that includes an appointment in the California Agricultural Experiment Station (AES). Faculty members who hold an Agricultural Experiment Station appointment have a responsibility to conduct research and outreach relevant to the mission of the California Agricultural Experiment Station. Participation in outreach programs and performance of University service are also expected.

The successful candidate is expected to develop an independent, productive and competitively funded research program in fundamental and/or applied virology regarding viruses and/or virus-like agents associated with plants. This includes work with emerging viral diseases of field, fruit and nut and vegetable crops in California and around the world. Areas of interest include virus-plant host interactions, diagnostics, epidemiology, seed transmission, and virus-vector interactions. We expect that this proposed position will exploit new technologies to develop knowledge that will contribute environmentally sound disease control methods for plant virus diseases that threaten agriculture. The individual may take advantage of the large-scale diagnostic capabilities at Foundation Plant Services (FPS) for virus discovery and develop associations with the Seed Biotechnology Center and Genome Center. More info in the [PDF](#).

To apply, please visit: <https://recruit.ucdavis.edu/JPF05269>

## **ACKNOWLEDGEMENTS**

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## COMING EVENTS

### Plant and Animal Genome Conference 30

13 January - 18 January, 2023  
San Diego, California, USA  
Website: [www.intlpag.org/30/](http://www.intlpag.org/30/)

### 3<sup>rd</sup> Global Soil Biodiversity Conference

13 March - 15 March, 2023  
Dublin, Ireland  
Website: [gsb2023.org](http://gsb2023.org)

### 68th Annual Conference on Soilborne Plant Pathogens and the 53<sup>rd</sup> Annual Statewide California Nematology Workshop

28 March - 30 March, 2023  
California, USA  
Website: [soilfungus.wsu.edu](http://soilfungus.wsu.edu)

### 13<sup>th</sup> International Congress on Plant Biotechnology and Agriculture

12 June - 16 June, 2023  
Cayo Guillermo, Cuba  
Website: [bioveg.bioplantas.cu](http://bioveg.bioplantas.cu)

### Plant Health 2023 – APS Annual Meeting

12 August - 16 August, 2023  
Denver, Colorado, USA  
Website: [www.apsnet.org/meetings/annual/Pages/default.aspx](http://www.apsnet.org/meetings/annual/Pages/default.aspx)

### 12<sup>th</sup> International Congress of Plant Pathology (ICPP2023)

20 August - 25 August, 2023  
Lyon, France  
Website: [www.icpp2023.org](http://www.icpp2023.org)

### XX International Plant Protection Congress

1 July - 5 July, 2024  
Athens, Greece  
Website: [www.ippcathens2024.gr](http://www.ippcathens2024.gr)

### 9<sup>th</sup> ISHS International Postharvest Symposium

11 November – 15 November, 2024  
Rotorua, New Zealand  
Website: [scienceevents.co.nz/postharvest2024](http://scienceevents.co.nz/postharvest2024)





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[WWW.ISPPWEB.ORG](http://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](mailto:business.manager@issppweb.org)

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