



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

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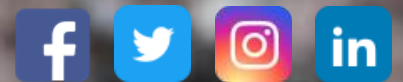
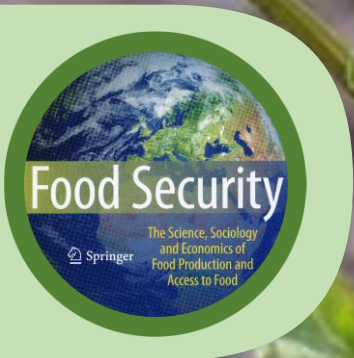
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INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)

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OBITUARY OF EVE BILLING, 1923-2019

GEORGE W. SUNDIN (MICHIGAN STATE UNIVERSITY), JAN E. LEACH (COLORADO STATE UNIVERSITY), AND JOHN W. MANSFIELD (EMERITUS PROFESSOR, IMPERIAL COLLEGE LONDON)

Dr. Eve Billing died peacefully on 18 February 2019, aged 95. Dr. Billing was an internationally-renowned plant pathologist who worked for most of her career at the East Malling research station (EMR) in Kent, UK. For over 50 years, Dr. Billing studied fire blight, a critical bacterial disease problem caused by *Erwinia amylovora*, that affects apple and pear trees throughout much of the world. Eve remained active and engaged in the fire blight system in her later years, and published her last scholarly paper in 2011 at age 87.

Eve Billing is best known for the development of Billing's integrated system, a disease modeling system that uses weather inputs to predict the occurrence of fire blight. The strength of this system was borne from Eve's vast knowledge and understanding of fire blight infection. The system provides an output of infection risk, and growers can then decide whether interventions are needed, and respond with appropriate management strategies. Her system, and others that followed it, have had lasting impacts on fire blight disease management. Eve also studied pathogen factors that contribute to the disease process, including a landmark study on the bacterial capsule that was published in 1978. Her inciteful work laid a foundation for the work of others and has culminated in our current understanding of the importance of biofilms to the fire blight disease process.

Eve was a highly-respected member of the international fire blight research community, and contributed to almost all of the meetings that have been held every three years since 1978 at sites around the world. The current [fire blight](#) meeting, to be held in Traverse City, Michigan in June 2019 will be dedicated to Eve, and we will remember her tremendous legacy and contributions to our field, and to apple and pear production. Eve's influence on *Erwinia* biology was also honored with the naming of *Erwinia billingiae*, an organism that can be isolated from trees showing fire blight symptoms.



REFLECTIONS FROM JAN LEACH: In a time when there were very few female role models in plant pathology, Eve, a petite and inspirational powerhouse, became a prominent phytobacteriologist, having built a tremendous body of foundational work on fire blight disease. She was an important mentor to me, starting from my first days at EMR as a postdoctoral fellow. I admired Eve's outside-the-box thinking, and I learned from her the power of bringing diverse and unconventional approaches to addressing plant disease questions.

Eve was also a generous, kind and fun friend who gave me the gift of her time, inviting me to her home for Sunday lunches or weekend stays and taking me on outings or to local concerts. All of these provided the opportunity to discuss our research projects as well as life in general. Shortly after I, a naïve Nebraskan, arrived at EMR, Eve picked me up for a Sunday outing.

I remember careening down a narrow country lane, on what was to me the ‘wrong side of the road’, in Eve’s car, which was about the size of a roller skate. After noticing that I was frequently hitting an imaginary brake on the passenger side of the car, Eve grinned and quipped, “I hope you don’t mind that I have never passed a driving test.” She had my wide-eyed attention. [Eve began driving during WWII, when tests (and, obviously, formal lessons) were not required].

It is an understatement to say that Eve was incredibly devoted to her research. As I was leaving EMR to start my career in the USA, Eve was retiring. But retirement from EMR did not mean that she was foregoing fire blight. On a Sunday visit to her home, Eve showed me how she was preparing her kitchen to serve as a lab so that she could continue her research after retirement. A newly purchased pressure cooker would allow media preparation for cultivation of *E. amylovora*. A new scale on her counter would be used to weigh the components for the growth media. Colourful labels with arrows were attached to the knobs on her oven; Eve had determined what temperature settings would allow her to use her oven to culture bacteria, incubate immature pear slices inoculated with bacteria (her disease assay), or to sterilise glass petri dishes! Although I left the UK just as she retired, I have always imagined Eve at her kitchen table happily dosing pear slices with bacteria! That is how I will remember her: a superb scientist with an endless passion for fire blight.

REFLECTIONS FROM JOHN MANSFIELD: I first met Eve in the early 80s after moving to Wye College. She was close to retirement having worked at EMR alongside Connie Garrett on fire blight and cherry canker. Eve persuaded me to carry out some experiments on *E. amylovora* using the naturally occurring mutants she had isolated from the field. She had various theories about the virulence factors that might have been missing and so it proved with one mutant lacking the key regulator HrpS. Eve often visited Wye to discuss her ideas with students - her latest analysis of the effects of weather conditions on fire blight outbreaks and also thoughts on gene for gene interactions and the role of her predicted “virulence factors”, that have turned out to be effector proteins. Not only did she continue to discuss various projects after her retirement but also completed an impressive series of publications. In addition to her valuable work on disease forecasting she made important advances in analysis of

bacteriophages and their potential as biocontrol agents. Although she is perhaps best known for her work on fire blight, she also co-authored one of the most quoted papers on the phytopathogenic fluorescent *Pseudomonads*, in which the elegant and simple series of LOPAT tests were used to identify species with remarkable accuracy. The tests she helped to develop continue to be the mainstay of diagnostics in plant clinics around the world. I last met Eve at a BSPP meeting in Oxford and she soon started asking me about various posters that she had scrutinised in far more detail than I had managed. Infectious enthusiasm for bacterial plant pathogens seems about the right way to sum up both my first and last impressions!

REFLECTIONS FROM GEORGE SUNDIN: I first met Eve in 2012 when I was in the UK and had a chance to take a side trip to visit her at her flat in Cirencester. I was amazed by the large file cabinets full of research notes, papers, books etc devoted to fire blight. We spent an afternoon discussing fire blight and she peppered me with questions and criticisms of my work, and brought up many relevant research hypotheses, often expressing a wish that she could tackle some of this work herself. In fact, my lab followed up on a number of these hypotheses working on aspects of the infection process of *E. amylovora* that had continued to be impacted by our further email discussions. I last visited Eve in July 2018, and she couldn’t contain her excitement about receiving some fire blight papers to read and about the chance to talk fire blight. It was a wonderful afternoon.

Dr. Eve Billing leaves a lasting and tangible legacy for future generations of plant pathologists. With digitisation, her research publications from as far back as the 1950s are accessible through the internet, and will continue to inform future work on fire blight. Eve’s parting comment to me last July was to “find a cure”; this will serve as inspiration to me and to my own group to continue to work expediently, collaboratively, and with purpose, such that our collective efforts can one day lead to sustainable management of this devastating disease.

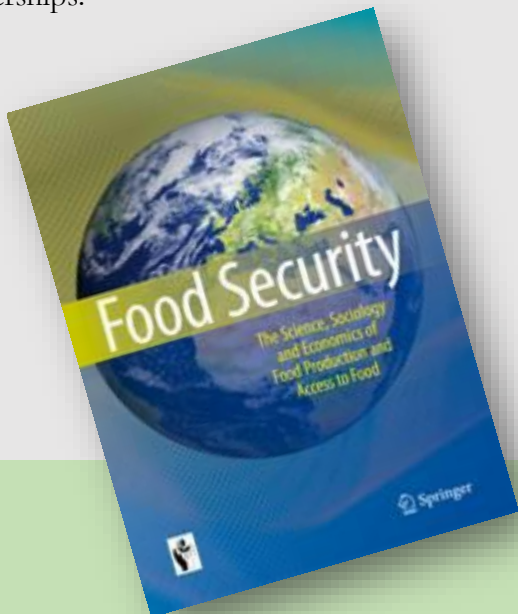
ISPP OFFERS LIFE MEMBERSHIPS

ISPP is an international association of societies for plant pathology. Individuals who are members of one of the [associated societies](#) are automatically associate members of ISPP. However, anyone can join ISPP as an individual member on an annual basis, with two options available including individual membership and individual membership package. The individual package includes:

- Individual membership of ISPP,
- Online personal calendar year subscription to Food Security, and
- 20% discount on all English-language books from Springer.

As of 2019, ISPP now also offers life individual memberships! The life membership does not include the journal subscription. (ISPP Fellows are automatically Life Members of ISPP).

Further details about [individual memberships](#) are on the ISPP website where you can securely purchase memberships.



AVERTING RISKS TO THE FOOD CHAIN

In this environment of climate change and global marketing of agricultural products, transboundary diseases, pests and threats to the food chain are increasing, so that every effort must be made to prevent them from being introduced and spreading to new environments. Prevention can save lives, save livelihoods and save money.

The purpose of this second edition of the Compendium of monthly Food Chain Crisis - Emergency Prevention Systems (FCC-EMPRES) information sheets is to share lessons learned over the last two years on the prevention and control of high-impact animal and aquatic diseases, plant and forest pests and diseases and food safety incidents.

The Compendium outlines what FCC-EMPRES teams did, what they grasped, and what the challenges to managing transboundary threats are, so that other initiatives may benefit and build upon the knowledge and best practices shared in the stories. Antimicrobial resistance, Fall armyworm (FAW), and African swine fever (ASF) are some of more widely known topics covered in this volume that are currently posing threats to public health, food safety and security, as well as to livelihoods, animal production and economic and agricultural development.

[Download PDF report.](#)

MECHANISM THAT HELPS PLANTS FIGHT BACTERIAL INFECTION IDENTIFIED

IQBAL PITTALWALA, UC RIVERSIDE NEWS, 28 FEBRUARY 2019

A team led by a plant pathologist, Hailing Jin, at the University of California, Riverside (UCR), has identified a regulatory, genetic mechanism in plants that could help fight bacterial infection published recently in *Nature Communications*. Working on *Arabidopsis thaliana*, Jin's research team found that Argonaute protein, a major core protein in the RNA interference machinery, is controlled by a process called "post-translational modification" during bacterial infection. This process controls the level of the Argonaute protein and its associated small RNAs — molecules that regulate biological processes by interfering with gene expression. This provides double security in regulating the RNA interference machinery. RNA interference, or RNAi, is an important cellular mechanism that many organisms use to regulate gene expression. It involves turning off genes, also known as "gene silencing."

Under normal plant growth conditions, the Argonaute protein and its associated small RNAs are well controlled by arginine methylation – a type of post-translational modification of the Argonaute protein. This regulates the Argonaute protein and prevents it from accumulating to high levels. The small RNAs associated with the Argonaute protein are also prevented from accumulating to higher levels, allowing the plant to save energy for growth. During bacterial infection, however, arginine methylation of the Argonaute protein is suppressed, which leads to the accumulation of the Argonaute protein and its associated small RNAs that contribute to plant immunity. Together, these two changes allow the plant to both survive and defend itself.

"Until our study, how the Argonaute protein got controlled during a pathogen attack was unclear, and just how plants' immune responses got regulated by the RNAi machinery was largely a mystery," said Jin, who holds the Cy Mouradick Endowed Chair at UCR and is a member of UCR's Institute for Integrative Genome Biology. "Ours is the first study to show that post-translational modification regulates the RNAi machinery in plant immune responses."

A TOMATO AROMA COULD PROTECT THE CROPS AGAINST BACTERIA

ASOCIACIÓN RUVID, FRONTIERS SCIENCE NEWS, 11 MARCH 2019

Tomato plants emit an aroma in order to resist bacterial attacks. This aroma— or volatile compound – is named hexenyl butyrate (HB), and according to a study published in *Frontiers in Plant Science*, it has great potential for protecting various crops from infections and drought.

“The application of this compound in fields will allow the industry to have a new natural strategy for improving crop yields: treatments will protect crops from biotic and abiotic stress easily, efficiently and at a low cost,” says Purificación Lisón, researcher at the Institute for Plant Molecular and Cellular Biology (IBMCP).

The researchers have proven that the treatment of the tomato plants with this compound causes the closing of the stomata and protects them from infection by the *Pseudomonas syringae* bacteria, increasing their resistance to it. In addition, they have observed that the treated tomato plants are more tolerant to drought. They have also confirmed HB’s stomata-closing efficacy in several species of vegetables, especially from the tomato, corn, alfalfa, citrus and tobacco families.

Another application could be controlling fruit development and the ripening processes. In those cases, treatment with the compound could be used in order to cause, in a controlled manner, treated plants to enter an induced “lethargy” of sorts, as the stomata-closing involves delaying the development processes. This could provide farmers a new strategy for controlling harvest times and adjust them better to the needs of the market.

UV TREATMENTS TO CONTROL POWDERY MILDEW IN STRAWBERRIES

PAUL RUSNAK, GROWING PRODUCE, 7 MARCH 2019

Novel uses of light to suppress pathogens like powdery mildew in several specialty crops have been tested by Natalia Peres, a Professor of plant pathology at the University of Florida, who is working with researchers from Rensselaer Polytechnic Institute (RPI), Cornell University, Norwegian University of Life Sciences, the Norwegian Institute of Bioeconomy, and the USDA Grape Genetics Research Unit. Thus far, the team has developed a tractor-drawn machine with several UV lamps. According to Peres, a breakthrough in the research recently took place when Norwegian researchers discovered that treatments were more effective when applied at night. She explained that the mildew pathogen evolved to survive natural UV in sunlight. But part of that adaptation to sunlight resulted in the pathogen not being able to defend against natural UV light at night. So, nighttime UV applications bypass the natural defenses of the pathogen.

While UV lamps are widely used in water purification and microbiological sterilization, they’re not yet commonly used for plant pathogen suppression. “UV treatments applied once or twice weekly were as effective as the best available fungicides applied on similar schedules for control of strawberry powdery mildew,” Peres stated in a prepared news release. “It’s not a one-time fluke. The trials have been repeated successfully for three seasons now.”

14TH INTERNATIONAL CONFERENCE ON PLANT PATHOGENIC BACTERIA, ITALY, JUNE 2020

NICOLA SANTE IACOBELLIS AND ROBERTO BUONAURO, CO-CHAIRMEN OF THE SCIENTIFIC AND ORGANISING COMMITTEES

The upcoming 14th International Conference on Plant Pathogenic Bacteria, entitled “The Impact of Plant Pathogenic Bacteria on Global Plant Health” will be held in Assisi, Umbria, Central Italy, during 7-12 June 2020. The conference mission is to promote and disseminate the latest scientific advances in all aspects of Phytobacteriology and encourage dialogue and collaboration between researchers.

The latest developments in the field, either basic or applied, will be presented and discussed at the conference. Plenary, oral and poster sessions will be held on key topics such as: Epidemiology and Ecology; Omics and Evolution; Control and Integrated Management; Diversity, Taxonomy and Diagnosis; Pathogenesis and Regulation; Disease Resistance and Effector Biology.

The proposal of special sessions may be considered by the Scientific Committee. In this regard, the year 2020 has been planned by the FAO as the International Year of Plant Health. A special session is planned to be organised in collaboration with the FAO with the aim to discuss the role and impact of plant diseases caused by bacteria on plant health worldwide.

A number of abstracts presented as poster contributions will be selected for short oral presentations and discussion. The participation of young researchers is strongly encouraged. Reduced registration fees for students and early-career postdoctoral researchers will be available. Awards for posters and presentations are planned for these two groups.

The meeting proceedings are planned to be published as a special issue in the *Journal of Plant Pathology*.

Further information and important dates is available on the conference website: www.icppb2020.com



SEED MICROBIOME MAY UNLOCK SUSTAINABLE ALTERNATIVES

AMERICAN PHYTOPATHOLOGICAL SOCIETY, 25 MARCH 2019

Recent advances in next-generation sequencing technologies have allowed scientists to access and assess previously undetectable plant microorganisms. Scientists have long known that various plant-associated microorganisms contribute to plant health and productivity but were unable to analyse them in plant seeds due to technical restrictions. Thanks to the enhanced development of high-throughput sequencing methods, plant seed microbiomes have been increasingly studied.

In a study published in the fully open access [Phytobiomes Journal](#), a group of scientists led by Tomislav Cernava utilised this new technology and were the first to assess the seed microbiomes of two successive plant generations of tomato plants, selected due to its importance to the human diet. The team identified and characterised microbial

communities in different compartments of the tomato.

The research showed that seed endophytes have distinct compositions and harbour different beneficial bacteria. The team also found that plant seeds were an important vector for the transmission of beneficial microorganisms across generations. Notably, they found that the seed is an important vehicle of plant growth-promoting bacteria.

This novel discovery has an impact for the design of seed treatment. Cernava explains: "These findings provide a basis to further explore how plant seeds can be specifically equipped with beneficial microorganisms and provide the basis to develop sustainable alternative to chemical inputs, such as fertilisers and pesticides, in agriculture."

ABSTRACTS EXTENDED FOR BIOCONTROL2019

PROF. GIORGIO M. BALESTRA, SYMPOSIUM CHAIR

The deadline for abstracts submission for BIOCONTROL2019 has been extended to 30 April 2019. Further details on submission are in the 2nd Circular contained on the website: www.biocontrol2019.com.

BANANA STREAK VIRUS DESTROYED WITH CRISPR

MICHAEL LE PAGE, NEW SCIENTIST, 31
JANUARY 2019

The CRISPR genome editing method has been used to destroy banana streak virus a virus that lurks inside many of the bananas grown in Africa. Other teams are trying to use it to make the Cavendish bananas sold in supermarkets worldwide resistant to a disease that threatens to make it impossible to grow this variety commercially in future.

In places like west Africa, where bananas are a staple food, most bananas have now the virus lurking inside them. When these plants are stressed by heat or drought, the virus emerges from dormancy and causes outbreaks that can destroy plantations.

Leena Tripathi at the International Institute of Tropical Agriculture in Kenya has now used the CRISPR genome editing method to target and destroy the viral DNA inside the genome of a banana variety called Gonja Manjaya. The plan is to use these plants to breed virus-free plants for farmers. Her team is also using CRISPR to make the bananas resistant to the virus, so they are not simply re-infected.

OAK WILT - THE PATHOBIOME

JAMES DOONAN, INDEPENDENT, 21
FEBRUARY 2019

British oak trees are under threat from a disease known as acute oak decline (AOD). Mainly affecting mature trees, it can kill them within four to five years of symptoms appearing.

For more than 100 years, scientists have identified which single organism causes a disease according to Koch's postulates. However, more recent research into both plant and animal illnesses has shown that these are too strict, and that we need to start considering how multiple bacteria interact to cause a disease in what is called a "pathobiome". A pathobiome is essentially a community of interacting bacteria that together cause a disease in animals and plants.

AOD, for example, arises from several bacteria which together degrade the trees' vascular tissues, preventing transport of water and nutrients to the branches and leaves. We have recently identified two bacteria as causative agents of AOD – *Brenneria goodwinii* and *Gibbsiella quercinecans* – while others, including *Lonsdalea britannica* and *Rabnella* species, have been detected, although their role is currently unclear.

Alone, the bacteria which form the pathobiome are harmless, or are less severe. But when alongside other organisms the likelihood, incidence and severity of disease is increased. This gives rise to "emergent property", meaning that the disease causing property is greater than the sum of the combined organisms.

[Read more.](#)

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 30 April 2019 and remain open until filled. Further details about the position and how to apply are available in the [PDF](#).

ACKNOWLEDGEMENTS

Thanks to Grahame Jackson, Greg Johnson, Jan Leach, John Mansfield, Andrea Masino, and George Sundin for contributions.

COMING EVENTS

19th International Reinhardsbrunn Symposium on Modern Fungicides and Antifungal Compounds

7 April - 11 April, 2019

Friedrichroda, Germany

Website: plant-protection.net/de/reinhardsbrunn

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

2nd International Symposium on Fire Blight of Rosaceous Plants

17 June - 21 June, 2019

Traverse City, Michigan, USA

Website: www.canr.msu.edu/fireblightsymposium/

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

51st Pest Management Council of the Philippines Anniversary and Annual Scientific Conference

2 July - 5 July, 2019

Coron, Palawan, Philippines

Contact: Mr. Freddie Webb B. Signabon

philphytopath@gmail.com

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 2019

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)

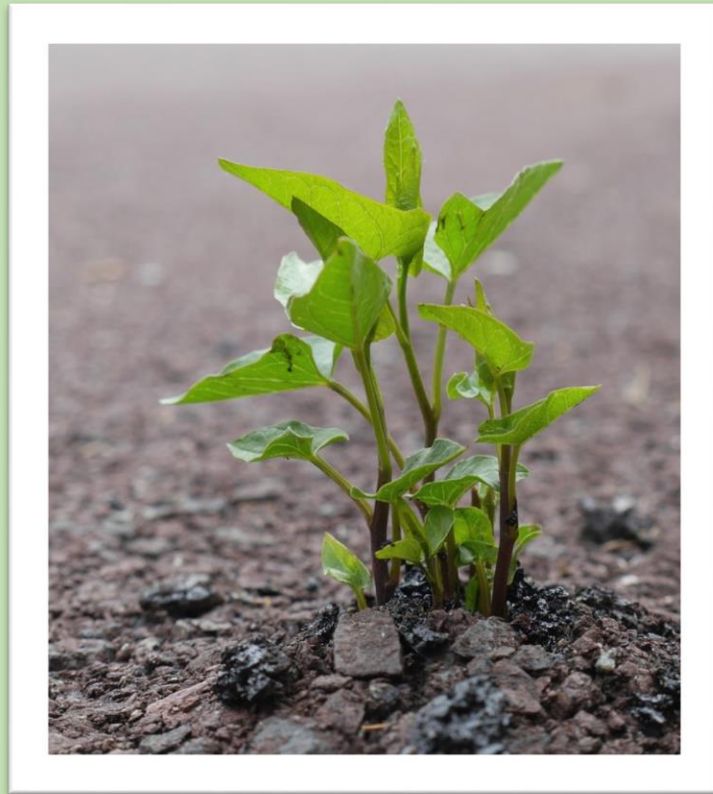
20 August - 25 August, 2023

Lyon, France

Website: www.icpp2023.org



INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)



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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