INTERNATIONAL NEWSLETTER ON PLANT PATHOLOGY

ISPP Newsletter 47 (7) July 2017

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

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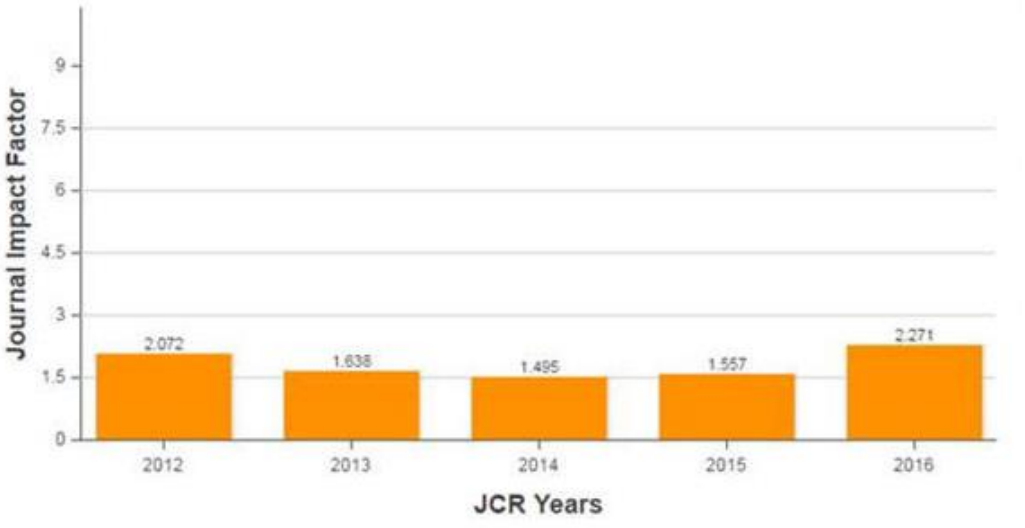
In this issue:

Impact factor for Food Security is on the rise

The impact factor for the journal, Food Security, has increase from 1.557 in 2015 to 2.271 in 2016.

Well done Richard Strange and Stephen Waddington and the editorial team as well as Zuzana Bernhart and Springer colleagues.



ICPP2018 Bursary Assistance Awards

The 2018 International Congress of Plant Pathology (ICPP2018) Organising Committee is offering need-based travel awards to increase access for early- and mid-career plant pathologists and related plant health scientists working in developing countries who otherwise would not be able to participate in the Congress.

ICPP18 bursary assistance awards are available, based on eligibility and selection, for the express purpose of offsetting costs associated with attending ICPP18 (i.e. registration, airfare, and/ or lodging).

Details on eligibility, the application process and submission instructions are available on the conference website: http://www.icpp2018.org/hoteltravel/Pages/Travel-Awards.aspx

Applications close 12:00 p.m. (central daylight time U.S.A.) on 31 August 2017.

ISPP Newsletter contents can now be embedded

You may notice the ISPP website and newsletter are undergoing some style changes. A less noticeable change is that other societies can now include the ISPP newsletter contents on their sites without ever having to update. The contents will automatically update each month when a new issue is released. Instructions for embedding the newsletter contents can be found by clicking the 'Embed Newsletter' link in the menu above. An example can be seen on the Australasian Plant Pathology Society (APPS) multimedia page at http://www.appsnet.org/media.html.

If you need more help with embedding or creating inline frames please contact the ISPP web manager http://www.isppweb.org/jotformbm.asp.

(Peter Williamson, ISPP Web Manager)

Summary on report on the IV International Postharvest Pathology Symposium

The IV International Postharvest Pathology Symposium, organised by Prof. Lise Korsten, University of Pretoria, was held in Skukuza, Kruger Park, South Africa, from 28 May to 3 June 2017. The symposium was devoted to exploring next generation innovation and commercial solutions for postharvest pathology to reduce losses, enhance quality, and ensure product safety. The symposium attended by 120 delegates from 23 countries including many students, new young scientists, industry representatives, producers, exporters as well as known established researchers in the field of postharvest pathology. This symposium is held every two years and serves as an excellent opportunity to exchange ideas, share experiences and for new collaborations to invigorate research and development activity in the area of postharvest pathology. ISPP Postharvest subject matter committee and the International Society for Horticultural Science (ISHS) working group on biological control of postharvest diseases jointly organize the symposium.

In the opening ceremony address, Prof. Lise Korsten, the convener of the symposium, Prof. Chris Watkins, the chair of the ISHS commission Quality and Postharvest Horticulture and Prof. Samir Droby, the chair of the Postharvest Pathology subject matter committee of the ISPP, welcomed the participants. They emphasised the importance of the symposium in light of the challenges in reducing food losses and the mounting demands for safe produce throughout the supply chain.

The scientific program included 80 oral presentations among which 14 were invited speakers. Sessions were dedicated to new advances in various technologies that are changing the way we look at pathogens and the disease process involved in host-parasite interactions as well as management strategies. Technical sessions included: elucidation of host-pathogen interactions and epidemiology, molecular studies of postharvest pathogens, alternative postharvest disease control strategies, innovation in postharvest disease control, next generation technologies for real-time solutions, disease control in the postharvest environment, the microbiome in food health and disease and postharvest food safety. There were two round table discussions about the microbiome in the postharvest context (led by Prof. Samir Droby), and novel technologies and emerging trend in postharvest disease control (led by Dr. Michael Wisniewski).

The social program included several game drives through Kruger Park, African meals in the bush, traditional dancers

and an authentic symposium gala dinner in Skukuza. There was also an enjoyable full day tour to avocado and citrus pack-houses and a visit to Citrus Research International (CRI) facility in Nelspruit.

During the business meeting held at the end of the symposium, there was full agreement to continue the format of a biannual meeting on the subject of postharvest pathology in order to foster exchange of knowledge and collaboration between members of the international postharvest pathology community. The next meeting will be held in Belgium in 2019.

Participants at the IV International Postharvest Pathology Symposium in Skukuza, Kruger Park, South Africa.

(Samir Droby and Lise Korsten)

Asian Conference on Plant Pathology, South Korea, September 2017

The deadline for abstracts and registration has been extended to 31 July for the Asian Conference on Plant Pathology to be held in Jeju in South Korea during 13-16 September 2017. More information on the conference website www.acpp2017.org.

Foundational and translational research opportunities to improve plant health

A white paper by Richard Michelmore et al. titled "Foundational and translational research opportunities to improve plant health" was published in July 2017 by Molecular Plant-Microbe Interactions (vol. 30 pp. 515-516). The abstract is as follows:-

The white paper reports the deliberations of a workshop focused on biotic challenges to plant health held in Washington, D.C. in September 2016. Ensuring health of food plants is critical to maintaining the quality and productivity of crops and for sustenance of the rapidly growing human population. There is a close linkage between food security and societal stability; however, global food security is threatened by the vulnerability of our agricultural systems to numerous pests, pathogens, weeds, and environmental stresses. These threats are aggravated by climate change, the globalization of agriculture, and an over-reliance on non-sustainable inputs. New analytical and computational technologies are providing unprecedented resolution at a variety of molecular, cellular, organismal, and population scales for crop plants as well as pathogens, pests, beneficial microbes, and weeds. It is now possible to both characterize useful or deleterious variation as well as precisely manipulate it. Data-driven, informed decisions based on

knowledge of the variation of biotic challenges and of natural and synthetic variation in crop plants will enable deployment of durable interventions throughout the world. These should be integral, dynamic components of agricultural strategies for sustainable agriculture.

The full white paper is available as a PDF

Special Issue on Fusarium Head Blight and Wheat Blast

Special issue on Fusarium Head Blight and Wheat Blast has just been published in Tropical Plant Pathology. Papers are freely accessible until 21 August 2017. Go to papers.

Book of abstracts and videos of keynote presentations on Fusarium Head Blight and Wheat Blast

A Book of Abstracts and videos of some of the keynote presentations are freely available from the joint meetings of The 5th International Symposium on Fusarium Head Blight (ISFHB) and the 2nd International Workshop on Wheat Blast (IWWB). These meetings were held at Costão do Santinho Resort, Florianópolis, Brazil, from 6 to 9 April 2016 and had 141 abstracts, 20 keynote lectures, 24 invited talks and 97 poster presentations by researchers from all over the world.

Roland F. Line (1934 - 2017)

Roland F. "Rollie" Line, 83, research plant pathologist, U.S. Department of Agriculture, Agricultural Research Service and adjunct professor, Washington State University, passed away on June 4, 2017, at his Pullman home. Roland was born January 11, 1934, in Winona, Minnesota. He received his Bachelor of Science (1956), Master of Science (1959) and doctoral (1962) degree in plant pathology and genetics from the University of Minnesota. As a research associate at the University of Minnesota from 1959 to 1963, he was responsible for research on the ecological potential and survival of the stem rust pathogen.

Dr. Line led a cooperative U.S. Army, USDA and experiment station project on stem rust epidemiology and loss assessment from Oklahoma to North Dakota. It was the most innovative, extensive, and comprehensive study of its type in the history of cereal rust research, setting the stage for subsequent research. He assumed the leadership of the USDA program for the control of rusts and smuts at Pullman in 1968, and he and Frances have made Pullman their home since that time. Upon joining the USDA-ARS cereal disease program in Pullman, Dr. Line established a rust research program that had an even greater impact on the wheat industry.

Dr. Line was the first U.S. scientist to show that application of systemic, foliar fungicides was a feasible approach for the control of wheat rusts. Use of fungicides in 1981 prevented losses of more than $3 million in Washington state alone. Dr. Line served on numerous national committees through the years. He was active with the Whitman County Democrats, patiently chairing the Platform Committee for many years. He enjoyed traveling, doing research and reading on the subjects of history and politics. Dr. Line was a modest man who seldom talked about himself.

(Moscow-Pullman Daily News, 10 June 2017)

Untold Stories: Forty Years of Field Research on Root Diseases of Wheat - new book

Untold Stories: Forty Years of Field Research on Root Diseases of Wheat. 2017. James Cook. APS Press, 400 p.

Dr. R. James (Jim) Cook, a retired research plant pathologist, U.S. Department of Agriculture Agricultural Research Service (USDA ARS), ARS), Fellow and former President of ISPP, and emeritus Professor of plant pathology, Washington State University (WSU), has built a storied career over the past 40 years, one that has profoundly impacted his scientific discipline and the farmers who benefitted from his breakthrough research on wheat. His new book, titled Untold Stories: Forty Years of Field Research on Root Diseases of Wheat, chronicles many of his insightful experiences and imparts his philosophy, wisdom, and practical guidance for the benefit of researchers, students, agriculture

professionals, and farmers.

"Untold Stories is more than just a memoir. It is a story of discovery and how seemingly insignificant findings can be harnessed into practical solutions for growers," said Dr. Tim Paulitz, research plant pathologist at USDA's ARS and Adjunct Professor at WSU. "Jim intuits how to convert observations into scientific theories based on the biology of the pathogens, and then translates them into management practices for growers. This book is a model of how to integrate applied field work with basic lab discoveries."

Throughout the compelling stories and personal experiences shared in this book, readers can find practical crop management techniques and other beneficial information that can be used in the field and the lab. It reports unique experiences and knowledge for budding and veteran scientists alike and serves up 'bushels' of knowledge that growers and crop consultants can use to make more informed and successful decisions in the field.

"This book puts in one place, and in chronological order, the key results of my field research on root diseases of wheat and the stories behind the scores of projects," said Dr. Cook. "Most of the fundamental discoveries summarised in this book could only have been made in experiments conducted in the field, some requiring three years and longer."

Woven among the compelling stories and personal experiences, readers will find:

- A comprehensive account of the four most common root diseases of wheat known to science, and the agronomic and seed-treatment options for their management, with a focus on direct-seed (no-till), cereal-intensive cropping systems.
- Detailed experiences with root diseases of wheat and their management, encompassing 40 years of field research across all precipitation zones in the U.S. Pacific Northwest.
- Fundamental discoveries that could only have been made in the field, such as the 15-20% difference in grain yield when comparing the presence and absence of Pythium root rot achieved using soil fumigation as a research tool.
- Examples of Dr. Cook's unique research philosophy: test hypotheses in the field first, then research more deeply in the laboratory or greenhouse.

"One of my goals in writing this book is for scientists and growers to gain a new appreciation for the enormous economic and environmental cost of root diseases and seek ways through the latest tools and innovation to place root disease control on a level equal to what is already achieved with foliar diseases," said Cook.

In addition, the stories told and the realities shared in this book will help guide next-generation research, such as that in the new field of phytobiomes, inspiring a new generation of scientists to apply one of Dr. Cook's longstanding principles in conducting research on plant disease control: "Until it is done or confirmed in the field and in practice it is not done."

Visit http://www.shopapspress.org to learn more about this and other titles from APS Press.

(EurekAlert, 22 June 2017)

New funding to address the threat of myrtle rust to New Zealand

Plant and Food Research and Scion have been successful in the latest round of MBIE's Catalyst Strategic Fund with a project addressing the threat of myrtle rust to New Zealand. The project has three key aims: to establish the susceptibility of key species to myrtle rust, build scientific knowledge for successfully storing germplasm of Myrtaceae species, and develop 'in the field' plant pathogen detection and surveillance systems.

"This is very important and timely research now that myrtle rust is present on the New Zealand mainland," says Plant & Food Research Bioprotection Technologies Scientist and the project's Principal Investigator Dr Grant Smith.

The project will employ the expertise of Plant & Food Research, Scion, Plant Health Australia, Te Turi Whakamātaki (National Maori Biosecurity Network), the Queensland Department of Agriculture and Fisheries, NSW Department of Primary Industries and the Wellington Botanic Gardens. The project is also linked with scientists at Kew Gardens in the United Kingdom, who have significant expertise in the conservation of Myrtaceae species.

Read more.

(Scoop, 20 June 2017)

If it smells like a Petunia, it might be a pesticide

A scent that petunias and snapdragons release to attract pollinators may be an environmentally friendly control for pests like the spotted wing drosophila fly (SWD) and the brown marmorated stink bug. Agricultural Research Service (ARS) chemist Aijun Zhang discovered the fragrant chemical, methyl benzoate, which is also a popular ingredient approved by the U.S. Food and Drug Administration for use in foods, cosmetics and shampoo, can kill these insects and others. Few choices are available for controlling SWD, which is an invasive species from Asia. It has quickly spread across the United States and can cause significant damage to fruit crops, especially berries.

Zhang, who is with the ARS Invasive Insect Biocontrol and Behaviour Laboratory in Beltsville, Maryland, points out the possibility of a new bio-based pesticide—especially one based on an inexpensive chemical whose residue lasts a relatively short time in the environment-is exciting. Next, Zhang will test methyl benzoate's effectiveness against mosquitoes, fire ants, gypsy moths and stored-product insect pests. All of these insects are developing resistance to standard pesticides.

Read more.

(Agricultural Research Service News Service, 19 June 2017)

Parasitic nematodes that cause greatest agricultural damage abandoned sex

While most animals find that a sexual lifestyle is the best path for evolutionary success, certain root-knot nematode species can only reproduce without sex. Instead of hitting an evolutionary dead-end, these plant pests have a wider geographic range and can infect greater numbers of crops than sexual species. A group led by Etienne G. J. Danchin of the French National Institute for Agricultural Research (INRA) report these findings in a new study published 8 June 2017 in PLOS Genetics.

To investigate the reasons behind their success, researchers sequenced and assembled the genomes of the three most damaging root-knot nematodes and compared them to a sexual relative. The asexual genomes are large, with numerous duplicated regions resulting from past reproduction events where at least two individual genomes recently hybridized together. Further analysis showed that many of the gene copies had each evolved different sequences and functions. Besides these gene copies, the genomes of the asexual nematodes are rich in transposable elements, DNA segments that are able to move and multiply in genomes. These elements could provide genomic plasticity and have functional consequences too. The researchers suspect that the asexual nematodes' unusual hybrid genome structure has helped them to successfully adapt to a wide range of environments, even in the absence of sex.

These findings challenge the prevailing idea that sexual species will always outcompete their asexual relatives and may even have wider implications for our understanding of why sex evolved. The work also supports the existing idea that hybridization is an evolutionary phenomenon capable of giving rise to new parasites and infectious organisms. For plant breeders, a greater understanding of these economically significant parasites can potentially help in the breeding of better plant varieties that can resist nematode attacks and reduce crop losses.

(ScienceDaily, 9 June 2017)

Resurrected 'fossil' protein protects bacteria from viruses

A 4-billion-year-old protein engineered into modern E. coli protected the bacteria from being hijacked by a bacteriophage. The ancient protein, an ancestral form of thioredoxin, was similar enough to its present-day analogues that it could function in E. coli but different enough that the bacteriophage couldn't use the protein to its advantage. The work, which could be useful in plant bioengineering, appeared in Cell Reports on 9 May 2017.

"This is an arms race. Thioredoxin has been changing in evolution to avoid being hijacked by the virus, and the virus has

been evolving to hijack the protein," says senior author Jose Sanchez-Ruiz of the University of Granada in Spain. "So we go back, and we spoil all of the virus' strategy."

Thioredoxin happens to be one of the proteins that bacteriophage must recruit to survive and replicate. Without a hijack-able thioredoxin, the virus hits a dead end. In a series of experiments led by Asunción Delgado, then a post-doc at the University of Granada, the researchers tested seven reconstructions of primordial thioredoxins, ranging in age from 1.5 billion years old to 4 billion years, to see if they could function in modern E. coli.

Delgado, Sanchez-Ruiz, and their colleagues speculate that ancient proteins could be edited into plants to confer protection against crop-killing viruses. However, this idea has yet to be tested in plants. "If this is applied to plants, it wouldn't be genes from ancient bacteria; it would be genes from the same plant. It would be the ancestral version of a gene from the same plant," says Sanchez-Ruiz. "This is genetic alteration, of course, but it is a mild genetic alteration. This is not like having a gene from one species being transferred to a different species. Also, this would not be like Jurassic Park. It would just be a comparatively small change in a gene that the plant already has."

The researchers' next set of experiments will focus on the fundamentals of protein evolution, but they point out that understanding and resurrecting old proteins could be a key resource for biotech. Instead of introducing new elements, bioengineers may be able to re-use older ones from earlier in viruses and cells' co-evolutionary history. "Some people think that evolution is just a theory or is just some kind of philosophic explanation," says Sanchez-Ruiz. "Evolutionary studies have practical applications."

(Phys.org, 9 May 2017)

Phytoplasma affecting cassava orchards in Cote d'Ivoire

A recent paper in New Disease Reports by K.D. Kra reports that same phytoplasma on coconut palms and cassava in Cote d'Ivoire. The extract below is from the paper:-

"Recently, symptoms of leaf mosaic, curling and yellowing were observed in cassava orchards located in the coconut-growing villages of Badadon and Braffedon in Grand-Lahou, which are currently affected by Côte d'Ivoire lethal yellowing phytoplasma (CILY). Phylogenetic analysis (MEGA 4.0) based on the 16S rDNA sequence supported the grouping of the Côte d'Ivoire cassava phytoplasma within the 16SrXXII-B cluster, closely related to 'Ca. P. palmicola' (16SrXXII-A). To our knowledge this is the first report of a phytoplasma affecting cassava in Côte d'Ivoire. The findings suggest that cassava may be a potential alternative host for the CILY phytoplasma, which poses a serious threat for the food security of the smallholder coconut and cassava farmers, especially women in Grand-Lahou, Côte d'Ivoire."

Together with colleagues of Centre National de Recherche Agronomique (CNRA) and the Felix Houphouet Boigny University in Côte d'Ivoire, Roland Bourdeix and two other researchers from the French Agricultural Research Centre for International Development (CIRAD) recently prepared a project that releases to farmers coconut and cassava varieties from the international genebank. The main objective of this project is to evaluate different models of micro-distribution of coconut seeds. The second objective of the project is to increase very significantly the level of diversity of coconut palms in Côte d'Ivoire.

(Roland Bourdeix, Pestnet, 23 June 2017)

Jasmonic acid - how is it broken down

The hormone jasmonic acid plays a major role in the plant immune system and in regulating growth. Scientists have already learned much about how jasmonic acid works, but one important link was missing: what makes the plant's jasmonic acid level go down once the attack by a fungus or insect has been warded off? Plant biologists at Utrecht University and colleagues from the University of Amsterdam, have now discovered how the plant metabolises jasmonic acid, issuing the signal 'safe'. Controlling this mechanism may present new opportunities to increase resistance of crops to fungi and insects. The results of their research were published in the scientific journal PNAS on 30 May 2017. Once a plant detects an insect or fungus, it begins to produce the hormone jasmonic acid, which initiates an immune response that prevents further damage. After the attack, jasmonic acid is quickly broken down again. This is necessary because the hormone inhibits plant growth and development.

(Phys.org, 20 May 2017)

Acknowledgements

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