

# INTERNATIONAL NEWSLETTER ON PLANT PATHOLOGY

## ISPP Newsletter 45 (11) November 2015

News and announcements from all 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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### ISPP Council: Please remember to vote

During October 2015, a motion for amendment of some of the Rules under the Statutes of the ISPP was sent to ISPP Councillors for voting. Councillors, please remember to vote! The changes concern procedures for the nomination of the next Executive of the International Society for Plant Pathology (which will be elected for the term 2018-2023 during 2016-2017) and Rules concerning the hosting of the International Congress of Plant Pathology (which will be next selected during 2016 in a call for bids by ISPP Associated Societies to host the International Congress of Plant Pathology in 2023 (ICPP2023)). Councillors who have not voted can contact the ISPP Business Manager [here](#).

### Leaf Doctor: An App to quantify plant disease severity

A paper by S. J. Pethybridge and S. C. Nelson "Leaf doctor: A new portable application for quantifying plant disease severity" was published in October 2015 by Plant Disease (vol. 99, pp. 1310-1316). The abstract is as follows:-

An interactive, smartphone application was used on color images to distinguish diseased from healthy plant tissues and calculate percentage of disease severity. The user touches the application's display screen to select up to eight different colors that represent healthy tissues. The user then moves a threshold slider until only the symptomatic tissues have been transformed into a blue hue. The pixelated image is then analyzed to calculate the disease percentage. This study reports the accuracy, precision, and robustness of Leaf Doctor using six different diseases with typical lesions of varying severity. Estimates of disease severity from Leaf Doctor were highly accurate ( $R^2 \geq 0.79$ ;  $C_b \geq 0.959$ ) compared with estimates obtained from the discipline-standard, Assess. Precision was operationally defined as the ability of a rater to use Leaf Doctor and repeatedly obtain similar percentages of disease severity for the same image. Coefficients of variation were low (0.51 to 14.1%) across all disease datasets but a significant negative relationship was found between the coefficient of variation of estimates and mean disease severity. Other advantages of Leaf Doctor included comparatively less time for image processing, low cost, ease of use, ability to send results by e-mail, and the ability to create realistic standard area diagrams. Leaf Doctor is compatible with iPhone, iPad, and iPod touch and is optimized for iPhone 5. It is available as a free download at the iTunes Store.

[Read more.](#)

### New list of ginger (*Zingiber officinale*) diseases

A world list of important ginger diseases has been placed on the ISPP website for [Common Names of Plant Diseases](#) by Duy Phu Le, Mike Smith, Elizabeth Aitken and David Teakle. It lists four bacterial and phytoplasmal diseases, 22 fungal and oomycetes diseases, four nematode diseases and two viral diseases. It is accompanied by a list of one or more literature references for each disease.

The Chair of the ISPP Committee for Common Names of Plant Diseases would be pleased to receive comments on the lists. Your suggestions for expanding the list or using better disease names can be sent by email to [Dr David Teakle](#).

(David Teakle)

### **Vision Infinity for Food Security - new book**

The newly published book "Vision Infinity for Food Security - Some Whys, Why Nots and Hows!" by authors Shashi B. Sharma and John Wightman is a new perspective on the global food security situation and highlights the need for seeking a common vision and implementing global planning to define the manner in which the human species will manage its food security. The basic question of 'is there enough food' is examined in general and then in some detail. The history of food production is reviewed in the hope that lessons can be learned from the past. But even after ten thousand years of experience we are not able to feed adequately about a third of our total population, despite what statistics can be made to tell us. Intensive agriculture has stripped out the nutrients that support plant growth and marginalised extensive tracts of land. The global solution to feed the growing population has been and continues to be - produce more food. Even during the last 30 years, about 95 percent of global research investments have focused mainly on increasing productivity. However about a third of the food produced, sufficient to feed over two billion hungry people, is lost or wasted in the food value chain. Climate change is another confounding factor that impinges on our discussions. Pests of all kinds continue to destroy food before and after it is harvested, even though the technology to protect it is available. A huge amount of food is wasted in value chains, particularly at the domestic level. Global food production systems are exposed to unprecedented biosecurity risks posed by invasive harmful organisms and this trend is likely to further exacerbate as current approach to biosecurity is based on the notional premise that lines on maps and the legislation that goes with them is sufficient to halt epidemics. Solutions include extending the number of cultivated plant and animal species to include those that can prosper in what are currently considered to be extreme environments. [More details](#) on the Springer website.

(Zuzana Bernhart, Springer)

### **Essential Virology and Viruses of Tropical Crops - new book**

LIMA, J.A.A. 2015. Virologia Essencial & Víruses em Culturas Tropicais. Fortaleza. Edições UFC. 615 p.

This new book edited by Albérico A. Lima provides a complete review of plant virology in the Portuguese language. The book consists of 15 chapters divided into two parts. The first part describes, in detail, the basic principles of virology, general characteristics of viruses, modes of penetration into cells of healthy plants, transmission from infected to healthy plants, methods for virus diagnosis and characterization, and an overview of disease management approaches. The second part includes symptomatology, etiology, geographic distribution, and management of virus diseases of papaya, cucurbits, cowpea, passion fruit, banana, citrus and tomato. The book contains 112 illustrations, including images of equipment used at the plant virology lab of the Universidade Federal do Ceará, Brazil, for the study, identification and characterization of plant viruses. Much of the information presented in this book is based on research conducted at the plant virology lab of the Universidade Federal do Ceará, Brazil, by graduate students and postdocs under the supervision of Dr. José Albérico. The technical and scientific information presented in the book was organized towards the needs of students of plant virology, phytopathology, agronomy and microbiology who do not have basic knowledge in virology and plant viruses. Details about important viruses affecting tropical crops of Brazil were included in second part of the book to address the interests of Brazilian producers and agribusiness.



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(Katherine L. Stevenson)

### **20th Australasian Plant Pathology Society Conference in Fremantle, September 2015**

The biennial Australasian Plant Pathology Society (APPS) Conference was held in the historic port city of Fremantle, Western Australia, during 14-16 September 2015. Over 200 attended the conference with representatives from all seven state and territories of Australia as well as international delegates from Canada, France, India, Iran, Japan, Korea, Malaysia, Manawatu, Netherlands, New Zealand, Philippines, Serbia, South Africa, Saudi Arabia, Sri Lanka, Thailand, UK, Uruguay, and USA.

The program consisted of six plenary sessions followed by two to three concurrent sessions in the morning and

afternoon each day. A total of 64 posters were on display in the main hall accessible to participants during breaks.

The outgoing APPS President, Prof Eileen Scott from The University of Adelaide in South Australia delivered the presidential address titled "Research supervision: what can APPS contribute?" At each APPS conference there is a McAlpine Lecture, named after Daniel McAlpine who is considered to be the father of plant pathology in the Australasian region, which is extended to an eminent scientist in recognition of their significant contribution to Australasian plant pathology. In 2015, the McAlpine lecture titled "From then till now: 25 years of research into the biology and management of *Phytophthora cinnamomi*" was given by Prof. Giles Hardy from University Murdoch.

Four members received the award of Fellow of APPS: Prof. Giles Hardy for his contribution to understanding the impact of diseases on forest and woodland ecosystems; Prof. Barbara Howlett for her contribution to fungal genetics and diseases of brassicas; Prof. John Thompson for his contribution to research on root lesion nematodes that affect the Australian grain industry; and Prof. Colin Wellings for his contribution to research on resistance and control of stripe rust in wheat. The Distinguished Service Award was presented to Dr Philip O'Brien for his contributions as Editor-in-Chief of APPS since 2011 and membership of the APPS Management Committee and several conference organising committees. The inaugural Lester Burgess Award for Diagnostics, Extension and Research Communication was presented to Dr Len Tesoriero for his contribution to horticultural pathology in Australasia and South East Asia and research training. The Allen Kerr Postgraduate Prize was awarded to Dr Sharon van Brunschot for her work on virus and viroid diseases of tomato.

At the annual general meeting, Dr Kim Plummer was endorsed as the new President and members of the incoming Management Committee, based in Victoria, were endorsed and introduced.

There were plenty of mingling opportunities with the opening reception held at the Western Australian Maritime Museum and a conference cocktail dinner at the Fremantle Prison.



Prof Colin Wellings (awarded Fellow of the APPS), Dr Len Tesoriero (awarded Lester Burgess Medal), Prof. Eileen Scott (APPS President), Prof. Lester Burgess (Chair of the awards committee), Prof. John Thompson (awarded Fellow of the APPS), and Prof. Giles Hardy (awarded Fellow of the APPS)

### **International Mango Symposium and Plant Pathology and Entomology master class, September 2015**

The Northern Territory Government hosted the XI International Mango Symposium recently in Darwin, Australia, from 28 September to 2 October. In the plenary sessions key note speakers highlighted the Research and Development of mango and covered the important innovations in the mango industry followed by the three concurrent technical sessions including plant pathology. Five different workshops/master classes were held prior to the symposium from 26-28th September including entomology and plant pathology, tools for precision mango-culture, experimental design and analyses, flower manipulation in mangoes, and mango biotechnology. After the symposium, there were three days of science exchange and optional field days to Darwin and Katherine mango growing regions. The symposium attracted 192 participants from 26 countries.

The plant pathology and entomology master class was held on 26-27th September at Berrimah Farm, Darwin. The entomology section was covered by Dr. Brian Thistleton and Dr. Mary Finlay Doney. In the plant pathology section, Dr. Jose Liberato discussed the current status of mango malformation in the Northern Territory, Prof. Randy Ploetz described mango field diseases, Prof. Nimal Adikaram talked about mango post-harvest diseases, Dr. Abdul Rehman presented an overview of mango diseases in Pakistan, and Dr. Jane Denise Ray discussed the



mango fungal pathogens belonging to family Botryosphaeriaceae. Twelve people from different countries participated in this master class. Talks were followed by hands on training in which participants learned about the microscopic identification and characterisation of mango fungal pathogens.



Participants at the International Mango Symposium held in Darwin, Australia, from 28 September to 2 October, 2015 (photo Dr Brian Thistleton, NT DPIF).



Participants at the mango plant pathology and entomology master class held in Darwin (photo Dr Brian Thistleton, NT DPIF).



Participants at the master class learning microscopic identification and characterisation of mango fungal pathogens (photo Dr Brian Thistleton, NT DPIF).

(Syed Rehana Shah, Mubeen Lodhi Pathan, and Lucy Tran-Nguyen)

### **The future of agricultural pest control**

Crop protection technologies were a big focus at the annual [Agrow Awards](#), held on September 17th this year at London's Jumeirah Carlton Tower Hotel. This event recognises innovation from all over the world in fields such as formulation, packaging and crop protection. The recipient of the 2015 Agrow Award for best new crop protection product was presented to [Syngenta Crop Protection](#) for its [Elatus fungicide developed for peanut and potato growers](#). Elatus helps protect against a range of fungal infections like Rhizoctonia (stem canker), white mold, leaf spot and rust. It also has good rainfastness, which means that it's easily absorbed by plant material after application for effectiveness after rainfall or irrigation. [Read more](#) .

(Steve Brachmann, 8 October 2015)

### **The sound of single bacterium swimming**

To try and understand how bacteria can move so quickly, scientists have synthesised the sound of a single bacterium swimming. Dr Ashley Nord and Dr Matt Baker synthesised the sound of this whirring propeller when they attached microscopic polystyrene beads to the flagella of bacteria as part of their research into what makes them spin. The sound you can hear is perhaps more like a windy day at the South Pole than a classic motor sound, and it fades as the bacterium dies.

When Dr Nord and Dr Baker shone a laser light on the microscopic beads they'd painstakingly attached to the bacterium, they were able to study the movement of the tail-like flagellum. Feeding the data into a program generated the soundwave you can hear, although it's playing at eight times its normal speed. [Read more](#).

(Australian Broadcasting Commission News, 8 October 2015)

### **A framework to evaluate the emergence potential of plant pathogens**

The past decade has seen a marked emergence of new bacterial diseases that affect fruit and forest trees. Understanding the origin of the pests responsible for them is fundamental if we are to deploy appropriate surveillance methods. These are the challenges addressed by INRA's Plant Pathology Unit in Montfavet, using as a model the bacterium, *Pseudomonas syringae*, that causes kiwifruit canker.

This research project raised questions as to the virulence potential of environmental strains on kiwifruit. Their satisfactory ability to colonise the vascular system, in coexistence with currently epidemic strains, questions their possible acquisition of traits that could drive pathogenic potential through the natural horizontal transfer of genes from virulent bacteria. The plant pathogenic profile of strains from non-agricultural environments differs from that of *P. syringae* lines and presages the emergence of as yet unknown forms of bacterial canker on cultivated plants. By identifying specific genes, the scientists are now developing criteria that will enable evaluation of the epidemic potential of environmental strains with a view to forecasting, and possibly enabling, the preventive management of such emerging diseases. If it were possible to focus on the operon as the target for a monitoring

programme, this would facilitate management of the health of kiwifruit and other crops.

[Read more.](#)

(INRA Newsletter, October 2015)

### **Researchers discover key link in understanding billion-dollar pests in agriculture**

Plant-parasitic nematodes are a huge threat to agriculture, causing billions in crop losses every year. Plant scientists at the University of Missouri and the University of Bonn in Germany have found the first genetic evidence linking one method nematodes use to attack plants; they proved that they use a specialised hormone, cytokinin, to help them feed from the plant. This research could allow plant scientists to develop crop plants with enhanced resistance to these devastating agricultural pests.

The collaborative research which was published in *Proceedings of the National Academy of Sciences* recently has discovered that nematodes create their own form of plant cytokinin and that, by secreting the hormone into the plant, they actively control the cell cycle leading to the production of ideal feeding sites to support their development. These findings show the ability of the nematode to synthesise and secrete a functional plant hormone to establish long-term parasitism. Understanding how plant-parasitic nematodes modulate host plants to their own benefit is an essential first step in finding new technologies needed to develop crop plants with enhanced resistance to these devastating agricultural pests.

[Read more.](#)

(EurekAlert, 28 September 2015)

### **Acknowledgements**

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