ACPP APPS 2011

New Frontiers in Plant Pathology for Asia and Oceania

Inaugural joint 4th Asian Conference on Plant Pathology and the 18th Biennial Australasian Plant Pathology Society Conference

26–29 April 2011
Darwin Convention Centre

Contents

Welcome

On behalf of the local committee, I would like to welcome you to Darwin, especially those who come from areas ravaged by natural disasters and political unrest. We are here to participate in the inaugural joint 4th Asian Conference on Plant Pathology and the 18th Biennial Australasian Plant Pathology Society Conference. The conference provides an excellent opportunity to increase collaboration between neighbouring countries and share the latest scientific knowledge.

In the modern world where society is concerned about biosecurity, climate change and global warming, take heed that these important issues also impact on plant health. Worldwide losses from plant disease impact on human and livestock health by trade erosion, food security and market access.

The conference theme 'New Frontiers in Plant Pathology for Asia and Oceania' will be covered within our 15 different topics, highlighting the diverse aspects of plant pathology. We acknowledge our local and international plenary speakers who have come from lands far, far away—that is Indonesia, Thailand, USA, New Zealand, Japan and China. We wait in anticipation to hear about their pathology research from their different countries of origin.

We hope you enjoy the comprehensive scientific program, field day and the numerous workshops on offer.

The Darwin Convention Centre is situated on our gorgeous natural harbour and Darwin city is renowned as a vibrant city with tropical weather all year round, multicultural heritage, beautiful sunsets, fabulous fishing, delightful international cuisine, Indigenous art and natural wonders.

We hope you have the opportunity to stay beyond the conference and enjoy the experience of the laid-back Top End Territory lifestyle.

Lucy Tran-Nguyen
ACPP APPS 2011 Conference Convenor

Conference Secretariat

Conference Logistics*
PO Box 6150
Kingston ACT 2604

02 6281 6624 [ph]
02 6285 1336 [fx]
0448 576 105 [mobile]
conference@conlog.com.au
www.appc2011.org

*acting as agent for APPS

CONFERENCE LOGISTICS

Conference Organising Committee

- Lucy Tran-Nguyen (Convenor)
- Sean Bithell
- Jane Carter
- Andrew Daly
- Rebecca James
- Greg Johnson
- Rachel Meldrum
- Caroline Mohammed
- Jane Ray
- Gina Shaw
- Mark Sutherland
- Peter Williamson

Scientific Program Committee

- Mark Sutherland (Chair)
- Stanley Bellgard
- Sean Bithell
- Mark Braithwaite
- Victor Galea
- Morag Glen
- Jose Liberato
- Caroline Mohammed
- Philip O'Brien
- Gina Shaw
- Lucy Tran-Nguyen
- Peter Williamson

Sponsorship Committee

- Lucy Tran-Nguyen (Chair)
- Jane Carter
- Greg Johnson
- Caroline Mohammed
- Gina Shaw
- Peter Stephens
- Peter Williamson
- Doug Wilson

Workshop Committee

- Lucy Tran-Nguyen (Chair)
- Barbara Hall
- Rebecca James
- Jane Ray

Social Committee

- Jane Ray (Chair)
- Andrew Daly
- Rachel Meldrum
- Lucy Tran-Nguyen

Acknowledgments

- Workshop organisers
- NT Department of Resources Plant Industries staff
- NT local growers
- Conference Logistics staff

1130	*Evaluation of Australian essential oils on the growth of the postharvest pathogen* Monilinia fructicola **Elena Lazar-Baker** Department of Industry & Investment NSW	*Quantitative PCR and histopathological investigations of cereal tissues during infection by the crown rot pathogen* Fusarium pseudograminearum **Noel Knight** University of Southern Queensland, QLD	*A survey of root and collar rot pathogens of peas* (Pisum sativum) *in New Zealand* **Ian Harvey** PLANTwise Services Limited, NZ	*The length of an internal poly(A) tract of Hibiscus latent Singapore virus affects its infectivity in* Nicotiana bethamiana **Sheng Niao Niu** National University of Singapore, Singapore
1145	*Role of constitutive and induced defences in the resistance of unripe mangoes to* Colletotrichum gloeosporioides **Nimal Adikaram** University of Peradeniya, Sri Lanka	*Meta-analysis of stripe rust epidemiology, severity and yield loss in wheat in Western Australia* **Moin Salam** Department of Agriculture and Food WA	*Pests and diseases remain the main complaint of banana farmers in Indonesia* **Catur Hermanto** Indonesian Fruit Research Institute, Indonesia	*Influence of ZMROP1 expression on the infection of maize by sugarcane mosaic virus* **Zaifeng Fan** China Agricultural University, China
1200	*Preliminary studies on the biology, culturing and field release of* Puccinia spegazzinii *de toni.: a classical biocontrol agent for* Mikania micrantha *Kunth (mile-a-minute) in Papua New Guinea* **Annastasia Kawi** National Agricultural Research Institute, Papua New Guinea	*Characterisation of stripe rust resistance in selected South African wheat lines* **Johanna Snyman** University of Sydney, NSW	*Interesting new fungal and bacterial associations on horticulture and forestry hosts n New Zealand* **Megan Romberg** Ministry of Agriculture and Forestry—Biosecurity New Zealand, NZ	
1215	Review of alternatives to chemical control posters	Review of cereal pathology posters	Review of disease surveys posters	Review of virology posters

1230–1330	LUNCH	Exhibition Hall 2
	Editors Lunch	(off site)
1330–1430	Poster Session 2: Virology; Alternatives to Chemical Control; Disease Surveys; Cereal Pathology; Forest Pathology; Tropical Horticulture; Training, Extension and Technology Transfer; Prokaryotic Pathogens; Population Genetics	Exhibition Hall 2
1430–1500	**PLENARY 8** Chair: Treena Burgess, Murdoch University, WA **Professor David Zhou**, Chinese Academy of Forestry *Eucalypt diseases and their management in China*	Auditorium 2
1500–1530	AFTERNOON TEA	Exhibition Hall 2

1530–1700	Concurrent Oral Sessions			
	SESSION 13 **Disease Management C** Room: Auditorium 2 Chair: David Guest	**SESSION 14** **Plant-pathogen Interactions B** Room: Waterfront Room 1 Chair: Amanda Able	**SESSION 15** **Forest Pathology** Room: Waterfront Room 2 Chair: Morag Glen	**SESSION 16** **Virology B** Room: Waterfront Room 3 Chair: Catia Delmiglio
1530	*Integrated management of Phytophthora root rot of papaya in the wet tropics of far northern Queensland, Australia* **Lynton Vawdrey** Department of Employment, Economic Development and Innovation, QLD	*Common spear rot of oil palm: identification of pathogenic agents and potential role of water-related stress as predisposition factor* **Suwandi Suwandi** Hokkaido University, Japan	*Eradication and containment of* Phytophthora cinnamomi *from natural ecosystems* **Bill Dunstan** Murdoch University, WA	*Characterisation of resistance to Clover yellow vein virus in pea* **Ichiro Uyeda** Hokkaido University, Japan
1545	*Integrated pest and disease management on cocoa is profitable in Papua New Guinea* **Josephine Saul Maora** Papua New Guinea Cocoa Coconut Institute	*Unravelling the anthracnose disease complex of capsicum spp.—species,* formae specialis*, pathotypes* **Paul Taylor** University of Melbourne, VIC	*The potential risk of* Phytophthora *dieback in the Greater Blue Mountains WHA* **Zoe-Joy Newby** University of Sydney, NSW	*Occurrence and epidemiology of wheat dwarf virus in China* **Xifeng Wang** Chinese Academy of Agricultural Sciences, China
1600	*The Queensland sugarcane smut epidemic: research outcomes* **Rob Magarey** BSES Limited, QLD	*Interactions between* Phoma koolunga, Didymella pinodes *and* Phoma mediciginis *var.* pinodella, *casual agents of ascochyta blight on field pea in South Australia* **Jenny Davidson** South Australian Research and Development Institute, SA	*Bacterial diseases of* Eucalyptus **Teresa Coutinho** University of Pretoria, South Africa	*Molecular characterisation of a phytoplasma associated with sugarcane grassy shoot disease in Viet Nam* **Hoat Xuan Trinh** Plant Protection Research Institute, Vietnam
1615	*Screening and evaluation of fungicides for the control of sugarcane smut in seedcane* **Shamsul Bhuiyan** BSES Limited, QLD	*Molecular and morphological characterisation of variation of sugarcane smut* (Ustilago scitaminea *Sydow*) *in the Philippines* **Rosalyn Luzaran** Philsurin, The Philippines	Ceratocystis *species: increasing threats to tree health* **Jolanda Roux** University of Pretoria, South Africa	*Identification of the virulence factors and suppressors of posttranscriptional gene silencing encoded by ageratum yellow vein virus, a monopartite begomovirus* **Masato Ikegami** Tokyo University of Agriculture, Japan
1630	*Management of the major foliar diseases of mungbeans and peanuts in Australia* **Malcolm Ryley** Department of Employment, Economic Development and Innovation, QLD	*Characterisation of* Alternaria *species causing leaf blotch and fruits spot in apples in Australia* **Merran Neilsen** University of Queensland, QLD	*Silvicultural options for field management of Ganoderma root rot in* Acacia mangium *plantation* **Abdul Gafur** APRIL Forestry R&D, Indonesia	*New plant virus and viroid records in New Zealand: update 2008–2010* **Catia Delmiglio** Ministry of Agriculture and Forestry—Biosecurity New Zealand, NZ
1645	*Impacts of bacterial blast and orchard management on pear productivity* **Chin Gouk** Department of Primary Industries, VIC		*Spring needlecast in Tasmania—fungal communities and environmental factors* **Morag Glen** University of Tasmania, TAS	
1700–1800	APPS AGM			Auditorium 2
1830 for 1900	CONFERENCE DINNER			Darwin Convention Centre, Exhibition Hall 1

Day 3—Friday 29 April 2011

0730–1730	Registration open	Foyer
0900–0930	**PLENARY 9** Chair: Mark Sutherland, University of Southern Queensland **Mr Les Baxter**, Australian Centre for International Agricultural Research (ACIAR) *Plant pathology research and capacity building in developing countries: issues and opportunities*	Auditorium 2
0930–1000	**PLENARY 10** **Dr Vic Galea**, University of Queensland *Teaching and learning in plant pathology for a new century—what has changed?*	Auditorium 2
1000–1030	MORNING TEA	Exhibition Hall 2
1030–1100	**PLENARY 11** Chair: Ceri Pearce, Department of Employment, Economic Development and Innovation, Qld **Professor James Stack**, Kansas State University *Reconciling plant biosecurity strategy and tactics with trends in emergence and evolution of plant diseases*	Auditorium 2
1100–1230	Concurrent Oral Sessions	

	SESSION 17 **Alternatives to Chemical Control B** Room: Auditorium 2 Chair: Caroline Donald	**SESSION 18** **Plant–pathogen Interactions C** Room: Waterfront Room 1 Chair: Rosalie Daniel	**SESSION 19** **Disease Surveys B** Room: Waterfront Room 2 Chair: Christine Horlock	**SESSION 20** **Tropical Horticulture** Room: Waterfront Room 3 Chair: Jose Liberato
1100	*Onion stunt: factors associated with severity and management options* **Simon Anstis** South Australian Research and Development Institute, SA	*An oxidised derivative of linoleic acid (Mag-toxin) produced in* Pyricularia oryzae **Tetsu Tsurushima** Hannan University, Japan	*Disease surveys of vegetable and flower crops in the Dalat area of Vietnam, and selected IDM strategies* **Hoat Xuan Trinh** Plant Protection Research Institute, Vietnam	*Occurrence of branch dieback and canker of mangoes in Derby, north Western Australia* **Hossein Golzar** Department of Agriculture and Food WA
1115	*Australian essential oils as potential biocontrol agents for potato storage diseases* **Kylie Crampton** Department of Industry & Investment NSW	*Genetic transformation in* Colletotrichum truncatum *associated with anthracnose disease of chilli* **Adelene Auyong** University of Melbourne, VIC	*Evidence of absence or absence of evidence? Testing for viruses in Australian cereal crops* **Merrin Spackman** Department of Primary Industries, VIC	*Timing of field fungicide applications to manage postharvest diseases of mangoes* **Chrys Akem** Department of Employment, Economic Development and Innovation, QLD
1130	*Silicon enhances tolerance of banana to* Fusarium *wilt* **Kevan Walter Jones** University of Queensland, QLD	*An aldehyde dehydrogenase gene and a phosphinothricin N-acetyltransferase gene compose of a pathogenicity island with* hrp *genes of* Pseudomonas cichirii **Yasufumi Hikichi** Kochi University, Japan	*White leaf disease of sugarcane in the Lao PDR* **Rob Magarey** BSES Limited, QLD	Phytophthora *bud rot of oil palm in Colombia* **David Guest** University of Sydney, NSW
1145	*Biological control of* Pythium *root rot on hydroponic coriander* **Len Tesoriero** Department of Industry & Investment NSW	*Pathogenicity mechanism on* Verticillium *wilt of* Cotinus coggygria **ChengMing Tian** Beijing Forestry University, China	*Plant health surveillance in Timor Leste* **Valente Quintão, Jane Ray** Australian Quarantine and Inspection Service, NT	*Investigations into passionfruit short vine life in north-west Australia* **Barry Conde** NT Department of Resources
1200	*Biofumigant green manure crops for use in disease management* **Hoong Pung** Peracto Pty Ltd, TAS	*A change in the symptoms of vascular-streak dieback of cocoa in Southeast Asia and Melanesia* **Philip Keane** La Trobe University, VIC	*Surveys for stem canker and stem borer of durian in the costal areas of Cambodia* **Kim Eang Tho** The Royal University of Agriculture, Cambodia	*Post-harvest disease control in 'Arumanis' mango under sea-freight conditions* **Zainuri** University of Mataram, Indonesia
1215	*Evaluation of* Ochrobactrum *sp. as a potential bioherbicide for angled onion (*Allium triqetrum *L.) in laboratory conditions* **Parsa Tehranchian** RMIT University, VIC		Fusarium thapsinum *is the dominant species associated with sorghum stalk rot in Queensland and northern New South Wales* **Malcolm Ryley** Department of Employment, Economic Development and Innovation, QLD	*Influence of cyclones on disease incidence and severity in horticultural crops in far north Queensland* **Lynton Vawdrey** Department of Employment, Economic Development and Innovation, QLD

Control of powdery mildew in viticulture using milk and milk components

D. Godfrey[1], T.J. Wicks[2], P.R. Grbin[1], D.K. Taylor[1], D. Bruer[3], R. Crittenden[4], E.S. Scott[1]
[1]School of Agriculture, Food and Wine, The University of Adelaide, PMB1, Glen Osmond, SA 5064, Australia; [2]South Australian Research and Development Institute, GPO Box 397, SA 5001, Australia; [3]Temple Bruer Wines, RSD 226, Strathalbyn, SA 5255, Australia; [4]MG Nutritionals, 140 Dawson St, Brunswick, VIC 3056, Australia

Grapevine powdery mildew, caused by *Erysiphe necator* (syn. *Uncinula necator*), is the most economically important fungal disease of grapevine in Australia. Disease control is predominantly based on the use of sulfur and synthetic fungicides. However, toxicity of sulfur to agricultural workers and beneficial vineyard organisms, and the development of fungicide-resistance, are considerable incentives for investigating alternatives. Previous research has demonstrated the potential of bovine milk to reduce powdery mildew severity in a commercial vineyard; the current research aims to identify the components of milk responsible for antifungal activity, and to determine their mode of action. Experiments were undertaken to assess milk and milk components for efficacy in controlling powdery mildew on detached leaves *in vitro*. In particular, two milk fatty acids and a dairy waste stream exhibited curative activity *in vitro*. Materials shown to reduce disease severity were further evaluated in greenhouse and small plot vineyard trials to assess efficacy in a commercial environment. Ultimately, the objective of this work is to contribute to development of environmentally sustainable strategies for the management of powdery mildew.

Evaluation of Australian essential oils on the growth of the postharvest pathogen *Monilinia fructicola*

E.E. Lazar-Baker[1], K.A. Crampton[1], L. Spohr[1]
[1]Industry & Investment, Gosford Primary Industries Institute, Locked Bag 26, Gosford, NSW 2250, Australia

Brown rot caused by *Monilinia fructicola* is a major postharvest disease of stone fruit, leading to significant losses during marketing. Control of the pathogen is normally achieved through the use of conventional registered fungicides. Despite the relatively low toxicity of these chemicals a range of 'greener' alternatives are sought for controlling this disease.

Some essential oils exhibit antifungal properties against postharvest pathogens, which provides the opportunity to develop new safe postharvest treatments for fresh horticultural produce. The aim of this research was to evaluate the antifungal activity of Australian essential oils extracted from lemon myrtle (*Backhousia citriodora*), anise myrtle (*Anetholea anisata*) and tea tree *(Melaleuca alternifolia*) and two standards, citral and trans-anethole against the postharvest pathogen *Monilinia fructicola*. *In-vitro* trials have shown that *Monilinia fructicola* exhibited a different level of sensitivity to each essential oil/standard, but was highly susceptible to lemon myrtle oil and the citral standard at very low concentrations. The lemon myrtle and citral *treatments* were evaluated further in *in-vivo* trials for their antifungal activity via fumigation using inoculated nectarines. These trials confirmed that the oil and the standard exhibited antifungal activity, with the level of activity dependent upon the concentration. Lemon myrtle essential oil and citral show significant promise as biocontrol options for the control of brown rot of stonefruit.

Role of constitutive and induced defences in the resistance of unripe mangoes to *Colletotrichum gloeosporioides*

N. Adikaram[1], G. Sinniah[1], C. Karunanayake[1], C. Abayasekara[1]
[1]Department of Botany, University of Peradeniya, Sri Lanka

Anthracnose in ripe mangoes originates from quiescent *Colletotrichum gloeosporioides* infections in the immature fruit. Unripe fruit contains three classes of constitutive antifungal substances, gallotannins in the peel, chitinases in the latex and resorcinols in both. Gallotannins, 5-(12-*cis*-heptadecenyl) resorcinol and 5-pentadecyl resorcinol are present at fungitoxic levels in the unripe fruit and decline during ripening together with the latex. Mango peel tissues responded to *C. gloeosporioides* by activating ROS (O_2^- and H_2O_2) in the challenged cells, within 9 to 24 h. Conidia had germinated and produced melanised appressoria within 9-12 h. Cells challenged by *C. gloeosporioides* turned brown within 12h and displayed autoflorescence. There was no phytoalexin accumulation, however, enhanced chitinase, PAL and peroxidase activity and cell wall bound phenols were observed in the inoculated tissues compared to controls. There was differential gene activation within 24 h. In the cultivar `Karutha Colomban' resistant to *C. Gloeosporioides*, six cDNA's were differentially expressed as opposed to one cDNA in the susceptible 'Willard'. The study revealed that both constitutive and inducible defences play a role in the resistance of unripe mango to *C. gloeosporioides*. A part of the latex could be retained by harvesting fruit with 1 inch stalk intact and such fruits developed lesser anthracnose disease. Salicylic acid and Bion® applied as postharvest sprays enhanced fruit resistance lowering anthracnose development.

Preliminary studies on the biology, culturing and field release of *Puccinia spegazzinii* de toni.: a classical biocontrol agent for *Mikania micrantha* Kunth (mile-a-minute) in Papua New Guinea

A. Kawi[1], K. Kurika[1], J. Moxon[1], J. Saul-Maora[2], M. Day[3]
[1]National Agricultural Research Institute, Wet Lowlands Islands Programme, PO Box 204, Kokopo, East New Britain Province, Papua New Guinea; [2]Papua New Guinea Cocoa Coconut Institute, PO Box 1864, Kokopo, East New Britain Province, Papua New Guinea; [3]Alan Fletcher Research Station, PO Box 36, Sherwood, Qld 4075, Australia

Laboratory and field studies were conducted on the neotropical rust fungus, *Puccinia spegazzinii*, de Toni, a classical biocontrol agent of the invasive weed, *Mikania micrantha* Kunth to gain knowledge on its life cycle and to develop efficient mass rearing and field release techniques.

Aetiology and epidemiology of Fusarium head blight on the Liverpool Plains 2005–2009

P.A. Davies[1], L.W. Burgess[2], R. Trethowan[1]
[1]Plant Breeding Institute, University of Sydney, Private Bag 4011, Narellan, NSW 2567, Australia; [2]Faculty of Agriculture, Food and Natural Resources, University of Sydney, NSW 2006, Australia

Several localised epidemics of Fusarium head blight (FHB) of wheat occurred on the Liverpool Plains, in northern New South Wales, between 2005 and 2009. Both *F. graminearum* and *F. pseudograminearum* are reported as FHB pathogens in Australia, and both are found in the Liverpool Plains region. The epidemiology and control of FHB varies between pathogens, and thus, a clear understanding of the aetiology of the outbreak is required. A field study of 25 wheat crops affected by FHB was undertaken to investigate the aetiology of these outbreaks and the source of inoculum for infection, as well as the role of cropping history. Both *F. graminearum* and *F. pseudograminearum* were associated with the disease in all years surveyed. Sites where *F. pseudograminearum* was responsible for FHB infection always had a high level of stem colonisation by this pathogen, while sites with FHB caused by *F. graminearum* were often associated with the presence of maize, sorghum and durum in frequent rotation. At a number of sites, FHB occurred in the absence of inoculum sources, suggesting that dispersal of ascospores from remote sources may play a role in the epidemiology of the disease. This information has contributed to the development of integrated disease management strategies for FHB.

Quantitative PCR and histopathological investigations of cereal tissues during infection by the crown rot pathogen *Fusarium pseudograminearum*

N.L. Knight[1], A. Lehmensiek[1], D.J. Herde[2], M.W. Sutherland[1]
[1]Centre for Systems Biology, Faculty of Sciences, University of Southern Queensland, Toowoomba, Qld 4350, Australia; [2]DEEDI, Primary Industries and Fisheries, Leslie Research Centre, Toowoomba, Qld 4350, Australia

Crown rot of wheat is a significant cause of yield losses in many wheat producing countries, particularly Australia where the predominant cause is the fungus *Fusarium pseudograminearum*. Other cereals such as durum wheat and barley can also be affected. Partial resistance has been identified in a small number of wheat lines, such as 2-49 and Sunco, but the mechanisms of resistance shown by these lines have not been identified. Using quantitative PCR based on fungal translation elongation factor α DNA we have established that fungal biomass in partially resistant genotypes is reduced compared to susceptible genotypes in both seedling and adult cereal tissues. Histopathological examination of infection and colonisation of seedling and adult tissues, using the fluorescent dye solophenyl flavine, has not revealed any differences in tissue responses between partially resistant and susceptible host tissues, although there is a significantly slower spread of the fungus in the tissues of resistant genotypes. Infection is initiated predominantly through the stomata of surface-inoculated leaf sheaths. Colonisation of expanded stems frequently originates in the parenchymatous hypoderm, which becomes highly discoloured. Early infection of pith parenchyma cells is also frequent. Vascular tissues become colonised by anthesis and this occurs more rapidly in susceptible genotypes. Occlusion of large xylem vessels was rare during moderate infections while infection of phloem sieve tube elements is common.

Meta-analysis of stripe rust epidemiology, severity and yield loss in wheat in Western Australia

M.U. Salam[1], G.J. Thomas[1], W.J. MacLeod[1]
[1]Department of Agriculture and Food Western Australia, Locked Bag 4, Bentley Delivery Centre WA 6983, Australia

Stripe rust, caused by *Puccinia striiformis* f.sp. *tritici*, is a destructive foliar disease of wheat and globally causes considerable yield loss. Western Australia had been free from this disease for decades, although it prevailed in most of the regions of eastern and southern Australia. Stripe rust first appeared in Western Australia in 2002. Since then efforts have been made through controlled and field experiments in understanding the epidemiology of the disease, its variation in severity and resulting yield losses. Those experiments were conducted in years of varying disease incidence in contrasting environments using wheat varieties of varying resistance to stripe rust. While the experiments provide vital information related to the disease and its consequences, analysis and interpretation of individual experiments may not be enough to generalise information relating to disease across the state. Meta-analysis provides a better opportunity to address the issue. Meta-analysis is a quantitative approach that estimates a relative response from individual studies to find general trends and differences. In this paper, we present a meta-analysis of epidemiology, disease severity and yield loss in relation to stripe rust of wheat in Western Australia. From an application perspective, this analysis may form a basis to derive algorithm(s) for models to predict the severity of stripe rust and its consequences on wheat yield.

Characterisation of stripe rust resistance in selected South African wheat lines

J.E. Snyman[1], C.R. Wellings[1,2], U.K. Bansal[1]
[1]The University of Sydney, PBI Cobbitty, Private Bag 4011, Narellan, NSW 2567, Australia; [2]seconded from Industry & Investment NSW

Stripe rust, caused by *Puccinia striiformis* f. sp. *tritici* (*Pst*), became endemic in South Africa, since its introduction in 1996 and can cause extensive yield loss. Low annual yields, erratic rainfall and high cost of chemical control, renders resistance breeding the most cost-effective means of controlling stripe rust. The ability of rust pathogens to mutate and form new, virulent pathotypes necessitates the need for the identification and introduction of new resistance genes. To address this issue, a recurrent mass selection (RMS) breeding program was conducted at the Plant Breeding Laboratory, University of Stellenbosch, South Africa in order to combine rust resistance genes in acceptable agronomic breeding material. Sixty-five advanced lines from the RMS program, underwent

sugarcane smut. Nine fungicides were tested *in vitro* at various concentrations for their efficacy on teliospore germination. Azoxystrobin (Amistar®), quintozene (Quintozene® 750) and didecyl dimethyl ammonium chloride (Steri-max®) completely stopped germination of teliospores at 2.5 mg a.i./L. Propiconazole (Tilt®), triadimefon (Bayleton®), cyproconazole (Alto®) and acibenzolar-s-methyl (Bion®) significantly ($P<0.05$) reduced teliospore germination at 50, 100 and 200 mg a.i./L. Two field trials were conducted in 2008 and 2009, where seedcanes were dipped in a range of fungicide suspensions for five minutes at ambient condition prior to planting. No smut were observed over nine months when seedcane were treated with cyproconazole at 16 g a.i./100 L, propiconazole at 25 g a.i./100 L and triadimefon 48.5 g a.i./100 L. Strobulirin fungicide, azoxystrobin, was effective and showed <10% smut after nine months. The results have important implication for selecting new fungicides for the control of sugarcane smut in seedcane in Australia.

Management of the major foliar diseases of mungbeans and peanuts in Australia

M.J. Ryley[1], J.R. Tatnell[2]
[1]Agri-Science Qld, DEEDI, PO Box 102, Toowoomba, QLD, 4350, Australia; [2]Agri-Science Qld, DEEDI, Kingaroy Research Station, PO Box 23, Kingaroy, QLD, 4350, Australia

Mungbeans (*Vigna radiata* and *Vigna mungo*) and peanuts (*Arachis hypogaea*) are important summer pulse crops in northern New South Wales and Queensland. Mungbeans are grown as a short season, often opportunistic, crop from northern New South Wales to central Queensland. The bacterial diseases tan spot (caused by *Curtobacterium flaccumfaciens* pv. *flaccumfaciens*) and halo blight (*Pseudomonas savastanoi* pv. *phaseolicola*) and the fungal disease powdery mildew (caused by *Podosphaera fusca*) commonly occur at damaging levels on mungbean crops in all regions. Peanuts, traditionally grown as a non-irrigated crop, are being increasingly grown under irrigation and in the sugarcane farming systems of coastal Queensland. Rust (caused by *Puccinia arachidis*) and late leaf spot (caused by *Mycosphaerella berkeleyi*) cause significant yield losses in these areas. Management of the important foliar diseases of mungbeans and peanuts is being achieved through the integration of different strategies, with resistance playing a pivotal role for all of them. Targeted fungicide applications also play a key management role for both peanut diseases and for powdery mildew on mungbeans, while the use of seed with minimal contamination levels is important for the mungbean bacterial diseases. For both pulse crops, new varieties with improved resistance to these important foliar pathogens combined with other practices will improve their management in the future.

Impacts of bacterial blast and orchard management on pear productivity

C. Gouk[1], E. Mace[2], L. Byrne[2], D. Williams[2]
[1]Department of Primary Industries, 621 Burwood Highway, Knoxfield, Victoria 3180, Australia; [2]Department of Primary Industries, 255 Ferguson Road, Tatura, Victoria 3616, Australia

Low productivity and profitability of pear production have been an on-going concern to the Australian pomefruit industry. As many pear orchards have been in long term production for 20-60 years, a combination of factors may have an impact on tree health and productivity. Studies were conducted in seven pear orchards in the Goulburn Valley in Northern Victoria, a major production area in the largest pear producing state in Australia, to gain an understanding of the problem. Bacterial disease and orchard management issues were shown to be key factors contributing to poor tree health, low productivity and poor fruit quality. Bacterial blast, also known as pear blossom blast, caused by *Pseudomonas syringae* pv. *syringae*, had a significant impact on pear blossom and fruit numbers. Detailed analysis of fruit numbers and quality from fruit set to pack-out was useful for identifying biotic and abiotic factors contributing to poor fruit quality and low returns. Leaf and soil analyses showed an imbalance in micro- and macro-nutrient levels in these orchards. The data highlighted that both soil and leaf analyses are needed to provide sufficient information to determine the impact of nutrient status on tree health. Inadequate pruning was also identified as a factor contributing to poor tree structure and fruit yield.

Plant Protection Convention (IPPC) requirements. Specimen based pest lists are a key component of IPPC requirements. However, little is known about the plant health status of Timor Leste.

In April 2010, a joint Timor Leste Ministry of Agriculture and Fisheries/Australian Department of Agriculture Fisheries and Forestry plant health survey was conducted. The three week survey focused on central and western Timor Leste. Plant pathology specimens were returned to Australia, treated with gamma irradiation under quarantine import permit and identified at various laboratories.

Further surveys, of different regions and during different seasons, will provide a more robust and comprehensive picture of the nation's plant health status and the quarantine risks that face both Timor Leste and Australia.

Surveys for stem canker and stem borer of durian in the coastal areas of Cambodia

K.E. Tho[1,2], R. Baconguis[3], A. Raymundo[2], T. Dalisay[2]
[1]Faculty of Agronomy, Royal University of Agriculture, PO Box 2696, Dangkor District, Phnom Penh, Cambodia; [2]Crop Protection Cluster, College of Agriculture, University of the Philippines Los Baños, Laguna 4031, Philippines; [3]Institute of Community Education, College of Public Affairs, University of the Philippines Los Baños, Laguna 4031, Philippines

Surveys for the incidence of stem canker (*Phytophthora palmivora* Butl.) and stem borer (*Batocera rufomaculata* De Geer) of durian (*Zurio zibethinus* L.) were conducted in the major production area of Cambodia, from May to July 2010. In addition, participatory research among farmers, agricultural officers, and extension workers was initiated. Results indicated that the incidence of durian stem canker and stem borer were high in most orchards throughout the study area. Within three locations (Teuk Chhou, Kampot and Kep) in Kampot and Keb provinces, of the 300 trees examined over three-quarters and one-quarter were severely infected by stem canker and stem borer, respectively. Durians over 20 years-old have the most critical damages. Older trees displayed increased incidence and severity of stem canker (r^2*=0.071* and *0.098,* respectively), while for stem borer the incidence was relatively low (r^2*=0.015*). Stem borer tended to attack trees affected by stress or stem canker rather than healthy trees (r^2*=0.23*). Farmers tended to lack knowledge in pest control, resulting in heavy infestation by these pests, and the death of trees after 4 to 5 years. Low available capital and price competition from imported fruit also contributed to lower pest control.

Fusarium thapsinum is the dominant species associated with sorghum stalk rot in Queensland and northern New South Wales

L. Kelly[1,2], Y.P. Tan[1], M. Ryley[1], E. Aitken[2]
[1]Department of Employment, Economic Development and Innovation, PO Box 102, Toowoomba, Qld 4350, Australia; [2]School of Biological Sciences, University of Queensland, St Lucia, Qld 4072, Australia

Stalk rots and lodging are a continual threat to sorghum producers across Australia, particularly on the Darling Downs and central Queensland regions. The fusarium stalk rot pathogen was previously known as *Fusarium moniliforme* sensu lato, however it has now been separated into a number of species. These changes in taxonomy have led to the need to gain an understanding of the role that different *Fusarium* species play in sorghum stalk rots and lodging in Australia. Surveys have been undertaken throughout the major sorghum-producing regions in Queensland and northern New South Wales to identify the *Fusarium* species associated with stalk rot, and to determine their distribution and relative importance. To date, 296 *Fusarium* isolates have been collected from 64 sites. Of those, 197 isolates have been identified to species using either morphological characters alone, or both morphological and molecular techniques. *Fusarium thapsinum* is the dominant species in all regions and from all plant types sampled, followed by *Fusarium andiyazi*. The findings from these activities will assist in the development of an integrated disease management package for sorghum stalk rot in Australia. This study is a component of the GRDC funded Northern Integrated Disease Management project.

ISBN: 978-0-646-55541-6