

Welcome to the Foundation News in isolation!

What an extraordinary year 2020 is turning out to be: the summer of fire, floods and hail had us beaten up pretty bad and the effects on people, communities and the environment were deep and in many cases going to be a long recovery. And now with COVID-19, the immediate impacts on people around the world are almost unimaginable, and we know our world has changed deeply for the long-term.

However, despite some world leaders failing dramatically, the human race is mostly showing how inspirational it can be, with the true leadership being shown by so many giving us hope that we will come out the other side in a kinder and more just world. It is of some small and inspirational comfort to see so many reports of how the environment is bouncing back so strongly, with such speed and resilience.

Sitting at home in isolation, my mind has started to turn to the effects of isolation on biosecurity ... Certainly the COVID-19 Pandemic has reiterated the need to move quickly and decisively on invasive species! It has also appeared to catapult the term biosecurity into the mainstream like never before, at least in Australia. It caused me to reflect on how the definition of biosecurity has continued to evolve, nicely summarized on Wikipedia:

"Biosecurity, as originally conceptualized, was a set of preventive measures designed to reduce the risk of transmission of infectious diseases in crops and livestock, quarantined pests, invasive alien species, and living modified organisms.[1] ...

The term now includes the management of biological threats to people, industries or environment, which may be from foreign or endemic organisms, but can also extend to pandemic diseases ..." (<https://en.wikipedia.org/wiki/Biosecurity>, 27 April 2020)

And I note the new IGAB has it covered:

"Biosecurity is the management of risks to the economy, the environment, and the community, of pests and diseases entering, emerging, establishing or spreading."

And while it is easy to speculate that reduced passenger movements will reduce biosecurity risk along that pathway, it would be interesting to see the numbers. Perhaps more importantly is how will resulting changes to the way the world operates impact biosecurity risks and our systems, and how do can we shape this as an opportunity?

Foundation Projects impacted by COVID-19

Several of our investments are being impacted by the lockdown rules needed in response to the pandemic. Our project leaders are working through these as best they can and the Foundation will continue to support their work wherever possible. So far we know the following changes:

- The Plant Health Science Competition run by QDAF will continue but be modified (PBSF021)

- The Biosecurity Scavenger Hunt aimed at families and to be run at the Botanic Gardens in Sydney has been modified to raise awareness and distribute material through NSW Science Hubs and online ... watch this space (PBSF026).
- Geoff Pegg's work on myrtle rust with Butchulla peoples at Fraser Island is delayed due to travel restrictions (PBSF012), as is some of the field work for his new project assessing myrtle rust response post the summer's bushfires (see below; PBSF025)
- Ben White's project 'Strengthening the weakest link in peri-urban Medfly suppression' (PBSF022) will be delayed due to not being able run face-to-face surveys or training.
- The Regional Biosecurity Conference, led by the Burnett Mary Regional Group has had to be cancelled (PBSF008)

Project Leaders – please get in touch if your project has been delayed or modified!

The full list of our investments

Several interested parties have asked to see the list of Foundation investments since we began some 18 months ago ... All investments are described on our [website](#), and at the bottom of this newsletter is the full list ...

Fire and rust – Foundation determined to better understand the impact myrtle rust is having on species and ecosystem regeneration after fire

Fire is a natural part of Australia's landscape, but while the recent fires were completely unprecedented, they do allow us an opportunity to examine the impact *A. psidii* might have on regeneration. A new project ([PBSF029](#)) headed by Geoff Pegg from QDAF should give us some answers. This project aims to determine the impact myrtle rust is having in species and ecosystem regeneration. It hopes to produce:

- Baseline information on the effects of myrtle rust on ecologically and commercially significant species regenerating following wildfire.
- Established monitoring sites to assess impact on regeneration of Myrtaceae affected by wildfire.
- Information on possible management strategies required for adversely affected species.

For more information visit the [projects](#) page.

McTaggart publishing already ...

Alistair McTaggart has wasted no timing in leveraging his Foundation project ([PBSF018](#)) by publishing already in the European Journal of Plant Pathology. His paper is 'Sexual reproduction in populations of *Austropuccinia psidii*'.

The project aims to:

1. Foster collaborations between researchers from Australia, the USDA (United States of America), Scion (New Zealand) and FABI (South Africa), and provide DNA of *Austropuccinia psidii* from South Africa to determine genetic loci that distinguish strains of myrtle rust.
2. Determine the disease cycle of *A. psidii* in Australia through study of sexual reproduction.

More information on the project can be found on the [website](#) and the paper downloaded.

Foundation seeking to improve urban biosecurity ...

The Foundation has invested in a new project to enhance urban biosecurity in Australia, contracting Jess Lye at cesar to use a foundational approach to understand emerging risks, support resilient cities and safeguard rural industry ([PBSF027](#)).



Australian cities are undergoing a high rate of growth. Creating 'urban forests' to boost resilience is becoming more common, local governments are developing urban agriculture strategies and 'urban agriculture' has experienced a marked increase over the past decade. The imperative to improve urban biosecurity is obvious. The new project will:

1. Develop a guiding framework for initiation of biosecurity activities in a major Australian city (Melbourne & Greater Melbourne); and
2. Test and refine the methodology for developing the framework for use in other jurisdictions.

This work will develop and execute a process of identifying needs and risks at the city level that may be used to guide future work in the area of urban/peri-urban plant biosecurity in Australia. The resulting framework will be available for immediate use in Victoria and the project will test a methodology that will be replicable in other jurisdictions.

It is hoped that this project will run in parallel with the development of an urban biosecurity strategy at the national level. Cross-talk between this initiative (deep dive approach) and the national strategy initiative (high level) will be important to maximise the practicality of the resulting strategy.

For more information visit the [projects](#) page.

Foundation Chairman Professor Lovett invited to Chair as session at the Plant Health, Agriculture and Bioscience Conference in Amsterdam

Last newsletter we highlighted this important conference in the International Year of Plant Health (see below). This time we are delighted to share that our Chairman, Professor John Lovett has been invited to host a panel session 'Securing international plant biosecurity collaborations', building off his long history of working in Indonesia (see [PBSF003](#), [PBSF006](#)).



The Plant Health, Agriculture and Biosciences Conference, to be held 9-11 September 2020 in the Netherlands, will foster growth in plant health innovation and sustainability by driving collaborations, business opportunities, investments, and knowledge.

At this stage the conference is proceeding as planned. More information at the PHAB website (<https://phab2020.com/>).

Regional biosecurity Master Classes building capacity of our near neighbors and producing a book!

Following a successful International Master Class (IMC) in January 2018 the Foundation supported two Regional Master Classes (RMC), firstly in Salitiga (Feb 2019) and then in Kupang (Nov 2019).

The Programs comprised a mix of presentations by Indonesian and international speakers; workshops and exercises; development of project concepts and the preparation of brief papers (published).

The Project Team has recently released a publication "Plant Biosecurity and Biodiversity in Dryland Areas in a Time of Climate Change." Download the book from the [project page](#).

Crawford Fund conference papers now available online.

The Foundation was delighted to support the 2019 Annual Crawford Fund Conference: "*Weathering the 'Perfect Storm': Addressing the Agriculture, Energy, Water, Climate Change Nexus.*" The proceedings are now available on-line and can be [downloaded here](#) and individual papers are also available on speaker pages. Individual presentations will also be made available more broadly through [CABI](#) and the [AgEcon library](#).



Please note the 2020 Annual Conference has been postponed from the usual August date to 22-23 March 2021, again in Parliament House. The working title is "*Food & Nutrition Security – The Biosecurity, Health, Trade Nexus.*"

Capacity building is a continuous story – Foundation/PBCRC PhD off to South Africa!



Laura Fernandez-Winzer is a doctor in Biology who successfully finished her PhD in 2018 with the support of the **Plant Biosecurity CRC**. She focused her thesis on the Impacts of the invasive pathogen myrtle rust (*Austropuccinia psidii*) on the Australian native communities. She graduated in April 2019, and further developed her teaching skills, tutoring for the Biological Sciences Department as well as the International College, both at Macquarie University in Sydney.

Laura secured a postdoc position with the prestigious SANBI (South African National Biodiversity Institute) co-hosted by the University of Stellenbosch in December 2019. In this exciting new role, she will be testing and developing 20 indicators for biological invasions. This position was due to start in April 2020, but has been postponed due to the outbreak of COVID-19. She is currently located in Launceston (Tasmania), looking for biosecurity and/or teaching jobs until she can start her journey to South Africa.

<https://www.linkedin.com/in/laura-fernandez-winzer-9672b1bb/>

https://www.researchgate.net/profile/Laura_Fernandez28

Publications – a list of Laua's PhD publications can be found [here](#)

Environmental Biosecurity Roundtable gets a COVID-19 revamp ...

From the ACEBO's office:

'Unfortunately due to COVID-19 and reprioritisation of work for COVID-19 response, the first Environmental Biosecurity Roundtable for 2020 will not be going ahead; however, communication remains important. We are working to set up an online platform that we hope will enable environmental biosecurity stakeholders to still come together and share their experiences with each other – so stay tuned for that!'

Great to see work from our project exploring the use of isotopes in biosecurity being published ...

Dr David Murphy et al (PBSF010) explored the use of strontium isotopes as markers of provenance for biosecurity purposes. The work showed some potential and certainly added to our knowledge base. David and his colleagues have now published the work:

Murphy DT, Allen CM, Ghidan O, et al. Analysing Sr isotopes in low-Sr samples such as single insects with inductively couple plasma tandem mass spectrometry using N₂O as a reaction gas for in-line Rb separation. *Rapid Commun Mass Spectrom.* 2020;34:e8604.

<https://doi.org/10.1002/rcm.8604>

For more information visit the [projects](#) page.

Memberships

The Foundation invests in plant biosecurity science and capacity building. It is a not-for-profit member-based organisation – **join us!**

Members will benefit from:

- Supporting plant biosecurity research, development, extension and delivery activities, including improved science through projects, research scholarships, internships, masterclasses and fellowships;
- Participation which may include co-investment in APBSF managed programs, joint ventures, partnerships and investments with others in Australia and overseas;
- Identifying gaps and priorities in plant biosecurity science for Foundation investments;
- APBSF attracting, developing and managing grants and funds which advance plant biosecurity science;
- Being part of plant biosecurity science and knowledge sharing between plant biosecurity stakeholders and plant biosecurity scientists;
- Advocating the importance of investing in plant biosecurity science globally, regionally and nationally for agriculture, the environment, regional communities, biodiversity and food security;

For more information, visit the [website](#) or contact the Foundation directly.

The [Foundation's investments](#)

RD&E and Capacity Building Projects

- Workshop: tracking and forecasting of pest and pathogen movements (PBSF028)
- Urban plant biosecurity: Using a foundational approach to understand emerging risks, support resilient cities and safeguard rural industry (PBSF027)
- Ornamental and Asian vegetable plants as entry pathways for viruses (PBSF024)
- Strengthening the weakest link in peri-urban Medfly suppression (PBSF022)
- Boosting biosecurity awareness and action in the freight and logistics industry (PBSF015) COMPLETE
- Updating Charles Darwin University's 'ENV521 – Community Engagement for Biosecurity and Natural Resource Management' unit (PBSF014) COMPLETE
- National Masterclasses to Improve Biosecurity for Control of Soil-borne Diseases on Strawberry Farms (PBSF013) COMPLETE
- Pursuing sensitive limits of biochemical geographic discrimination as generic tool for high risk pest Plants (PBSF010) COMPLETE

Myrtle Rust

- Fire and rust – impact of myrtle rust on regeneration of fire damaged Myrtaceae and associated ecosystems (PBSF029)
- Expanding environmental biosecurity capacity to protect unique ecosystems on K'gari (Fraser Island) (PBSF025)
- Developing molecular 'fingerprinting' of myrtle rust disease to facilitate strategies in monitoring and control (PBSF023)
- Enhancing community capacity to assess the impacts of myrtle rust on rainforest Myrtaceae in ecologically and culturally significant lowland subtropical rainforests associated with World Heritage Gondwana Rainforest ecosystems (PBSF020)
- Resolution of disease epidemiology and detection of genetic and genotypic diversity in Australian populations of myrtle rust (PBSF018)
- Myrtle Rust Masterclass – Community Awareness (PBSF009) COMPLETE
- Expanding environmental biosecurity capacity to protect our unique ecosystems (PBSF012)
- Expanding Indigenous communities biosecurity surveillance and monitoring capacity to care for country and to protect country from pest and diseases (PBSF011)
- Plant Epidemiology: host susceptibility to Myrtle Rust (PBSF004)

International Projects

- Reversing the impact of Banana blood disease in Indonesia (PBSF016)
- Regional Master Classes in Plant Biosecurity (Indonesia)(PBSF006) COMPLETED
- Biosecurity Planning workshop, Indonesia (PBSF003) COMPLETE

Sponsorships

- Biosecurity Surveillance Scavenger Hunt for the International Year of Plant Health (PBSF026)
- 2020 'Plant Health' Queensland DAF Hermitage Research Facility Schools Plant Science Competition (PBSF021)
- Katharina Belt: Early Career Scholarship to attend the Australasian Plant Pathology Society Conference (PBSF019) COMPLETE
- Crawford Fund Annual Conference (PBSF017) COMPLETE
- Myrtle Rust Masterclass – Community Awareness (PBSF009) COMPLETE
- Burnett Mary Regional Biosecurity conference (PBSF008) CANCELLED due to COVID-19

- 2019 'Pest Invaders' DAF Hermitage Research Facility/Customer Support Officer and Competition Coordinator (PBSF007) COMPLETE
- Australasian Plant Pathology Society 50th Anniversary Conference: Strong Foundations, Future Innovations (PBSF005) COMPLETE

Capacity Building Projects – PhD students novated from the PBCRC

- Detection and prevention of scab disease in Asian and European pears (PBCRC62050)
- Psyllid microflora - Implications for Liberibacter disease surveillance and pest control (PBCRC62116)
- Epidemiology, impact and management of myrtle rust in lemon myrtle plantations (PBCRC62118)
- Probiotic diets to increase Queensland fruit fly male performance as part of the sterile insect technique (PBCRC63083)
- Ecological impacts of invasive fungus in Australian native plant communities (PBCRC62117)
- Curtailing and managing exotic fungal spore incursion into Australia (PBCRC62042)
- Perceptions and behaviours of Vietnamese farmers towards biosecurity threats in Australia (PBCRC64139)
- Evaluating chlorine dioxide and ozone to control insects in stored grain (PBCRC63052)
- New, non-chemical technologies to protect grain during storage and transport (PBCRC63058)
- Understanding the mechanisms of dust-induced insect death and biological effect (PBCRC63060)

Commercial Projects

The Foundation owns two key pieces of commercial Intellectual Property, and consistent with its Purpose, aims to have the IP developed for enhanced biosecurity outcomes and commercial return to the Foundation.

- The Davren™ Technology Package is being developed by a specialist spin-off company Davren Global Pty Ltd, wholly owned by the Foundation, and funded under the Research Agreement PBSF001.
- Pestpoint™ is licensed to Checkpoint Pty Ltd, co-developers of the IP.