

Australia's transition to management of myrtle rust – Short Communication

C. HOWARD, V. FINDLAY, C. GRANT

Australian Government Department of Agriculture, Canberra, Australia.

ABSTRACT: *Puccinia psidii* sensu lato was detected in Australia in 2010 causing myrtle rust. A nationally cost-shared eradication program was conducted based on well-established emergency response arrangements for incursions of emergency plant pests into Australia, but it was ultimately decided that the pest was not eradicable from Australia. At this time, no formal mechanisms existed to provide a clear path for decision making and cost-sharing when transitioning from an eradication focus to long-term management of a plant pest. In 2011, the Australian Government established and funded a set of pilot transition to management programs for a number of noneradicable pests, one of which was for the myrtle rust pathogen, with the goal of using the outcomes of the pilot programs to guide the ongoing development of formal transition arrangements.

Keywords: Incursion; Plant Pest; Transition; Management; *Puccinia psidii* sensu lato

In April 2010, a strain of *Puccinia psidii* G. Winter was detected on myrtaceous plants in a nursery north of Sydney, New South Wales, Australia, causing myrtle rust (CARNEGIE et al. 2010). Soon after, a nationally-funded eradication effort ensued after initial delimitation surveys found that the fungus was limited to nurseries. However, as the pathogen was eventually detected in a large number of domestic, commercial, public and recreational sites, it was determined that eradication was not possible in December 2010 (CARNEGIE, COOPER 2011; Myrtle Rust National Management Group 2010). Due to the early observation of only asexual spores, the pathogen was initially identified as *Uredo rangellii* J.A. Simpson, K. Thomas & Grgur. (CARNEGIE et al. 2010), an organism identified as belonging to the *Puccinia psidii* species complex (SIMPSON et al. 2006). When sexual spores were subsequently observed in specimens that were collected during delimitation surveys, the causal pathogen was identified as *Puccinia psidii* sensu lato.

The attempt to eradicate the fungus from Australia totalled AUD \$3.53 million, which was funded through arrangements set out by Australia's Emergency Plant Pest Response Deed (EPPRD). The EPPRD is

a longstanding emergency response cost-sharing and governance agreement between Australian state and territory governments, the Federal Government, relevant plant industry bodies, and Plant Health Australia (Plant Health Australia is a not-for-profit company that coordinates the government-industry partnership for plant biosecurity in Australia) (Plant Health Australia 2014). The EPPRD is activated when an EPPRD-defined Emergency Plant Pest (EPP) is detected. The governance and cost-sharing arrangements provided by the EPPRD operate only for the eradication of EPPRD-defined EPPs. If it is determined by the relevant National Management Group (NMG) (the NMG is comprised of the chief executive officers of the national and state/territory departments of agriculture and primary industries across Australia, representatives of peak industry bodies and Plant Health Australia) that it is no longer technically feasible or cost beneficial to achieve eradication of the EPP, the emergency response stops and ongoing management of the pest becomes the responsibility of affected jurisdiction(s) and/or affected industry(s). As such, when the fungus was considered to be noneradicable from Australia in December 2010, cost-sharing

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and governance of any further action under the EP-PRD framework ceased.

At that time, there was no formal mechanism to provide a clear path for decision making and cost-sharing when transitioning from eradication to long-term management of noneradicable plant pests. Draft arrangements had been developed to support short- to medium-term containment programs, but these arrangements were still to be finalized. It was widely acknowledged that further support was needed to attempt to reduce the impact of the pathogen on the natural environment, the community and affected industries in Australia. However, the lack of formal transition arrangements highlighted the gap in national arrangements for pests that are not eradicable, but where further coordinated action is in the national interest. Therefore, in 2011, the Federal Government through the Department of Agriculture, Fisheries and Forestry (now the Department of Agriculture), established a set of pilot transition to management programs, one of which was for the myrtle rust pathogen. The goal was to use the outcomes of the pilot programs to guide the ongoing development of formal transition arrangements. The pilot program for myrtle rust consisted of a Federal Government investment of AUD \$1.5 million from July 2011 to June 2013 to facilitate coordination and governance, and to provide necessary research funding. The research funds were allocated for a number of theme-based research and development projects to gain an understanding of how, and to what extent, this pathogen may affect the Australian environment and industry, and to identify long-term strategies to ameliorate its impact (ANONYMOUS 2011). The Queensland and New South Wales governments and various research organisations also undertook other complementary activities to augment the program.

A summary of the pilot transition to management program for myrtle rust was presented at the International Union of Forest Research Organisations' Foliage, Shoot and Stem Diseases working party (7.02.02) meeting in Cerna Hora, Czech Republic, 2013. The theme of the meeting was 'Genomics and biotechnology for biosecurity and forestry'. The pilot myrtle rust transition to management program funded a number of genomics-based research projects that were relevant to the theme of the meeting. Firstly, a whole-genome analysis was utilized to determine the myrtle rust pathogen's relationship with other *P. psidii* s.l.

representatives, while the high-level taxonomic placement of the myrtle rust pathogen relative to other rust fungi in the Pucciniaceae was investigated using traditional phylogenetic techniques. Secondly, noting that surveillance projects rapidly identified that 109 species from 12 of the 17 tribes within Myrtaceae were recorded as being affected by the pathogen in Australia (CARNEGIE, LIDBETTER 2012), several projects were funded to employ 'next generation' DNA sequencing technology to enable the rapid screening of candidate resistance genes in plants showing resistance to the pathogen. Research in these fundamental areas should assist with the current management of the pathogen within Australia, and also to more effectively manage possible further incursions of the pathogen. The outcomes of these research projects can be found at www.myrtlerust.net.au.

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Corresponding author:

Dr. CHRISTOPHER HOWARD, Australian Government Department of Agriculture, P.O. Box 858, Canberra, ACT, 2601, Australia; e-mail: chris.howard@agriculture.gov.au
