

# Myrtle Rust in 8 slides Myrtle Rust Practitioners' Forum, 22 Feb. 2024

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## Myrtle Rust: Key facts

- Exotic (introduced) fungal disease, from South America.
- Attacks only plants in the Myrtaceae family.
- Moister habitats only (inland mostly unaffected).
- Spreads easily – airborne spores.
- Rapid life cycle: 10-12 days from one spore to thousands.
- Attacks new growth (and sometimes flowers, fruits).
- Host species vary in susceptibility (0% - 100%).
- Multiple 'strains' are known – only one in Australia so far.
- Huge host range: 524 species globally (rising), in 69 genera.
- Can complete a short-version (asexual) life cycle on any host species. Does not need an 'alternate host'.
- Highly susceptible plants cannot renew foliage; often no flower/fruit set. >> death, decline, extinction.



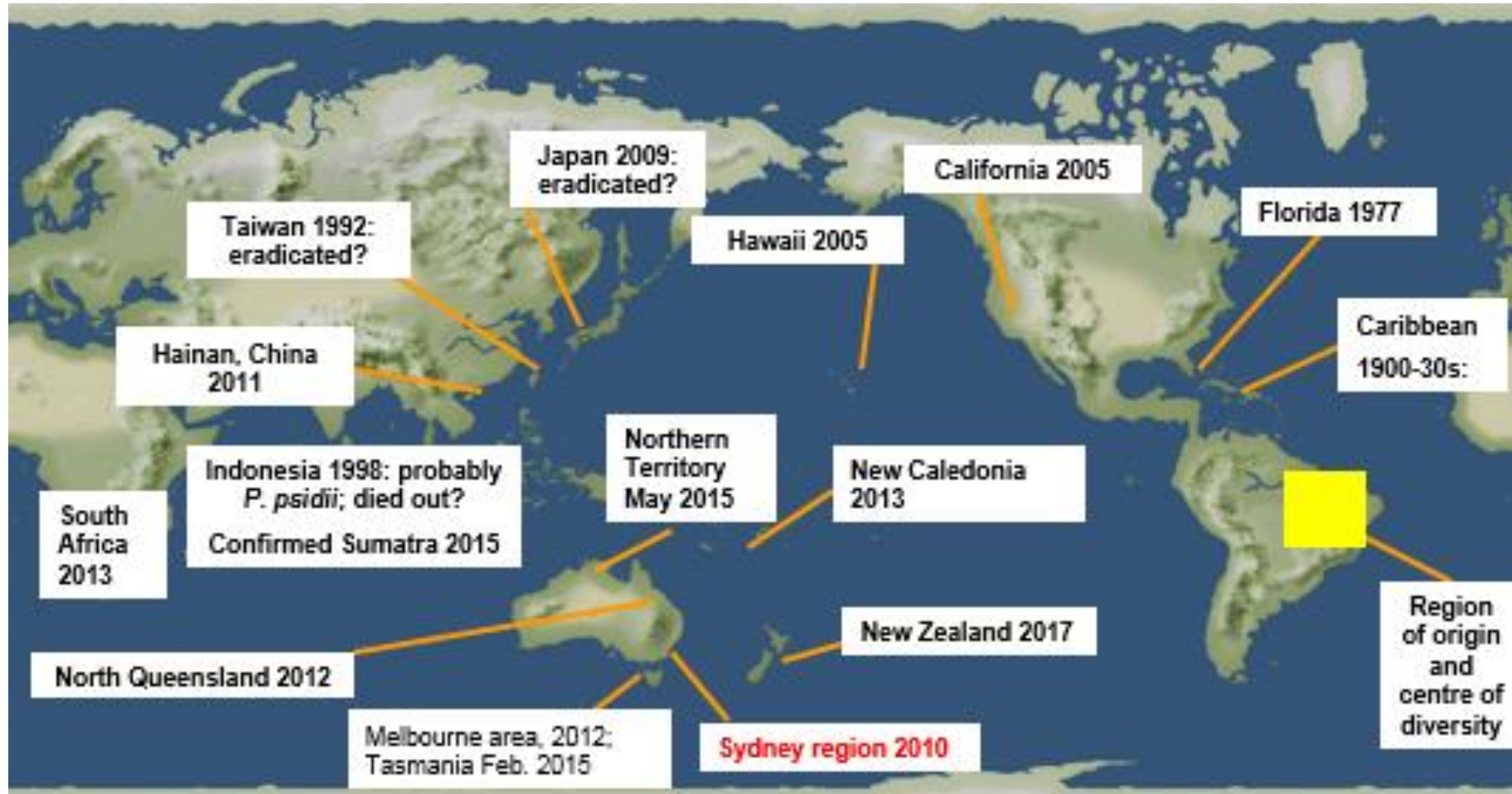
Broad-leaved Paperbark (*Melaleuca quinquenervia*), north-east NSW 2011.



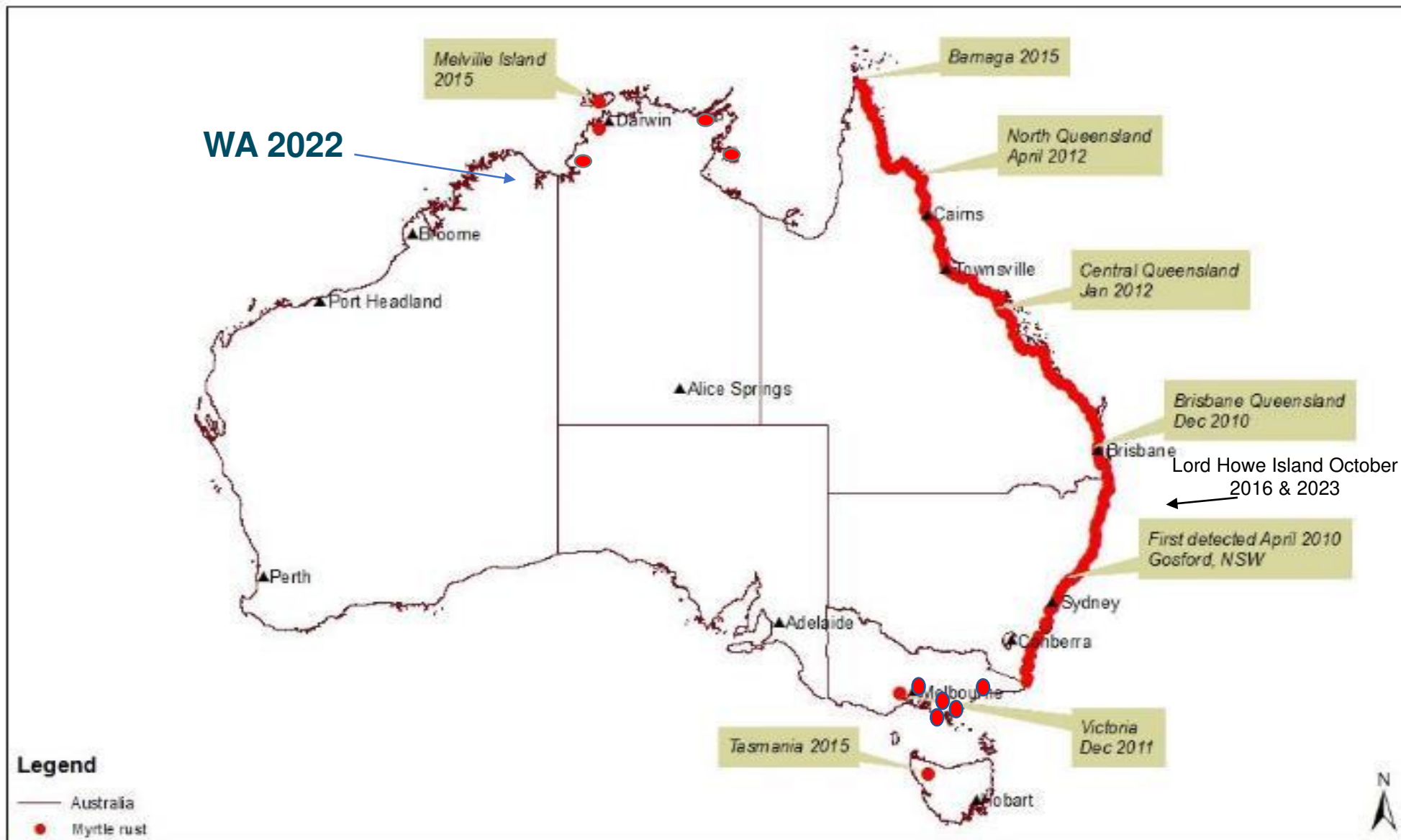
*Eucalyptus tindaliae*, coppice growth, Bungawalbin NSW, 2012.

Images: Peter Entwistle

## Global spread of Eucalypt/Guava/Myrtle Rust



Disease caused by *Austropuccinia psidii* is now recognised as a global biosecurity and biodiversity conservation problem.

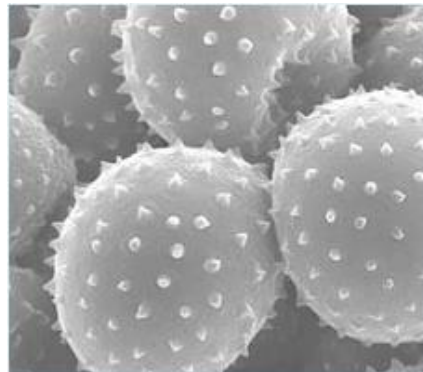
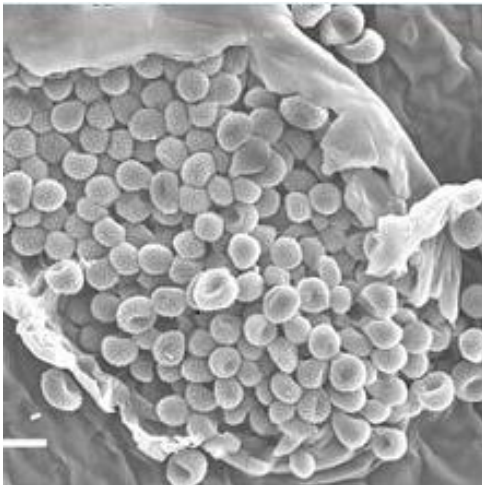


### Spread in Australia



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# How did it get to Australia?



We don't know ... but almost certainly human vector (transport of spores).

Maybe on live plant material, but could have been on clothes or bush gear.



# Effects of Myrtle Rust on susceptible plant species

New foliage and shoot damage or loss, distorted growth, reduced flowering & fruiting.  
If plant cannot renew foliage, eventual plant starvation and death.



Early-stage infection on *Rhodomyrtus psidioides* (RO Makinson);  
Heavy infection on young leaves of *Rhodamnia rubescens* (Jarman)  
Serial death of new shoots, *Rhodamnia rubescens* (AC Carnegie)  
Post-infection damage, *Rhodomyrtus psidioides* (RO Makinson)  
Infected coppice, *Eucalyptus tindaliae*, (P. Entwistle)  
Infected fruit, *Rhodamnia rubescens* (RO Makinson)  
Infected cotyledonary leaves, *Eucalyptus planchoniana* (GS Pegg)

## Treatments – YES in cultivation, NO in the wild

**Fungicides:** YES, but only in cultivation; some only, rotated. too toxic and broad-spectrum for wild.

**Bacterial & other biocontrols:** Some exist, poorly known. Effect weak, delivery difficult, ecological issues.

**Endophytes (inside host) – adjustment to promote resistance:** Exploratory work in New Zealand.

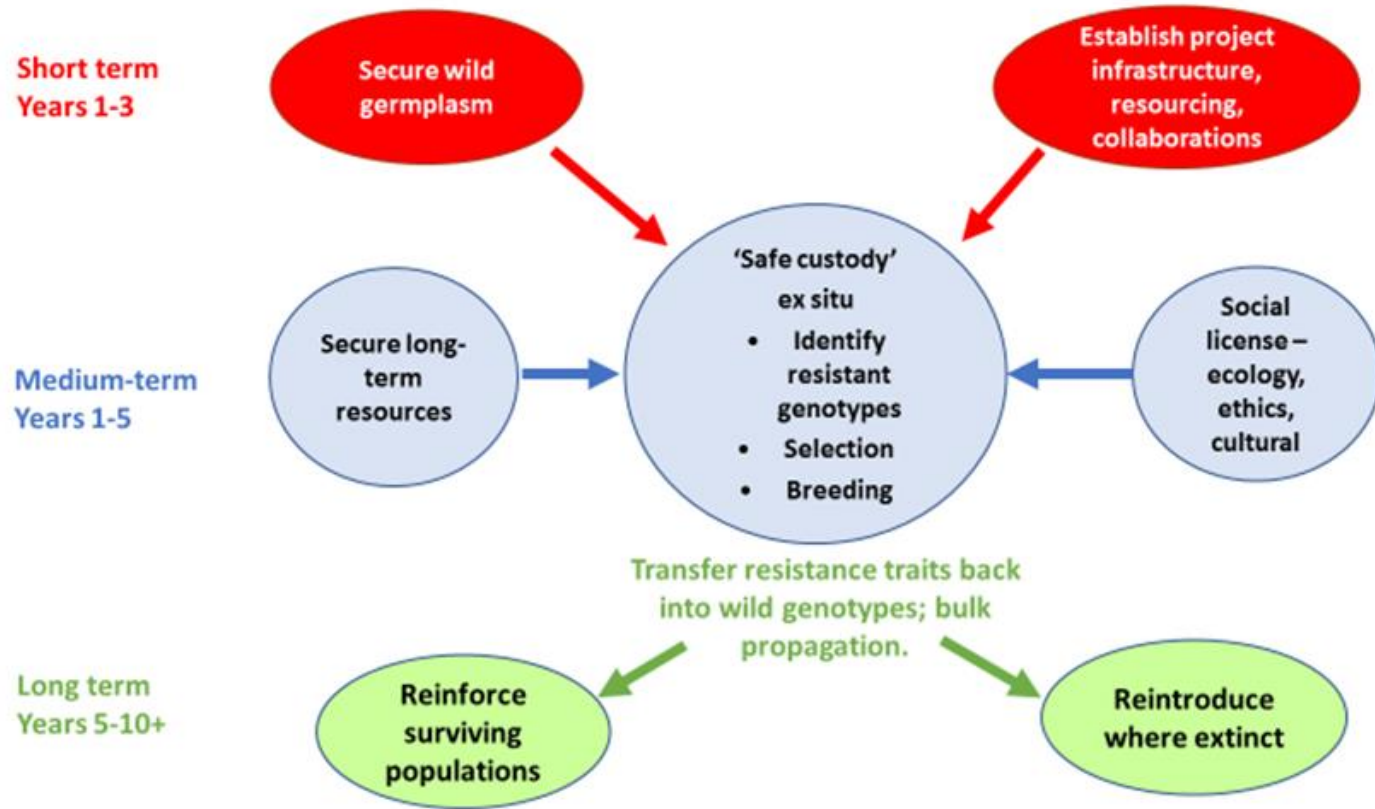
**RNA-interference sprays:** Under development – very specific to MR pathogen, non-toxic to anything else. Big help in cultivation, not in wild.

### For conservation and species recovery, we need:

- A large, dispersed, strongly coordinated and protected collection, with as many wild genotypes as possible;
  - Resistance research and breeding
  - Eventual ‘reintroduction’ or reinforcement of surviving populations.

**Key questions:** Do ‘resistant’ genotypes exist? Can they be selected and bred into a species? Can a wild species be reinforced or re-introduced? **Yes, yes, and yes.**

## Vision for species recovery



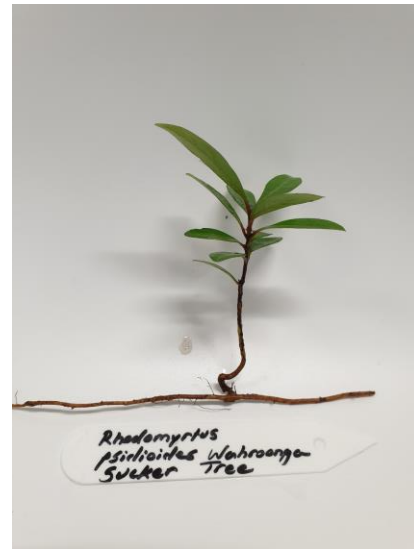
2018 *Myrtle Rust Reviewed*

2020 Myrtle Rust National Action Plan

Download from <https://www.anpc.asn.au/myrtle-rust/>



Example: *Rhodomyrtus psidioides* – wild sampling and ex situ collection development  
(at Australian Botanical Garden Mount Annan)



Next steps:

- Screen for rust resistance
- Select and amplify
- Field trials
- Reintroduction to wild

Clockwise from TL: Collection and bare-rooting of surviving wild suckers; aerial cuttings struck at 31 days; flowering & fruiting on cuttings at <2 years; seed germination; seedlings; tissue culture. Images: Makinson, Viler.