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Managing Myrtle Rust in Australia

Myrtle rust (*Uredo rangelii*) has the potential to infect all myrtaceous plants within our built (gardens & landscape), rural and natural environments along the coastline of Australia. Under threat from this disease, if it becomes widely established, are a number of identified threatened native plant species across Australia plus a range of endangered wildlife habitat(s) that could have a major impact on our natural biodiversity. Queensland Industry Development Manager John McDonald details in this Nursery Paper how to recognise and manage myrtle rust in Australia.

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Myrtle rust on Blushing Beauty Myrtle (*Austromyrtus inophloia*) foliage

Managing Myrtle Rust in Australia

Myrtle rust (*Uredo rangelii*), a plant fungal disease native to South America, is a member of the fungal complex known as the guava rust (*Puccinia psidii*) group and, based on information from Florida, Hawaii and Brazil, myrtle rust has a limited host range compared to that of guava rust. The disease infects young, actively growing, emerging leaves, buds, flowers, fruit and shoots of plants within the Myrtaceae family. In Australia to date the most severe infections of the disease have been recorded on *Agonis, Rodamnia, Tristania, Syzygium jambos* and *Austromyrtus* species.

Myrtle rust may infect plants under a wide range of environmental conditions, however infection rates may be heightened when the following conditions are present:

- Soft new growth/tissue
- High humidity
- Free water on plant surfaces for 6 hours or more
- Night temperatures within 15 - 25°C
- Low light conditions including darkness (minimum of 8 hours) after spore contact can increase germination success

Myrtle rust has the ability to complete its entire lifecycle on a single host plant. Life cycle can be as short as 10 – 14 days (spore to spore). This pathogen will infect plant tissue killing the foliage/fruit/stems/etc and in heavy infections will eventually kill the plant. As the plant discards dead foliage/ fruit/stems/etc the pathogen will reinfect new growth limiting the plants ability to recover.

It is possible that as this disease establishes in Australia the host range may grow to include many of the internationally recorded plant species infected by guava rust. The nursery industry must consider all myrtaceous species as potential hosts of myrtle rust

Note: Guava rust (*Puccinia psidii*) is also known as **eucalyptus rust** and has caused heavy crop losses in the Brazilian hardwood industry through the decimation of cultivated eucalyptus seedlings in the field. For identification purposes myrtle rust and guava rust are visually and symptomatically identical therefore identification tools are interchangeable.

The following are some of the Myrtaceae genera that have known susceptible species in Australia:

Acmena
Agonis
Austromyrtus
Backhousia
Callistemon
Chamelaucium
Choricarpia
Decaspermum
Eucalyptus
Eugenia
Gossia
Lenwebbia
Leptospermum
Melaleuca
Metrosideros
Myrtus
Pilidiostigma
Rhodamnia
Rhodomyrtus
Ristania
Syzygium
Tristania
Waterhousea
Xanthostemon

Image sourced Qld DEEDI

Myrtle rust on *Rhodamnia spp.* leaf

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A **Myrtle Rust Management Plan** (www.ngia.com.au) has been developed for use by production nurseries and retailers of greenlife including garden centres, greenlife markets (wholesalers), big box hardware, supermarkets, chain stores, etc. The plan provides a detailed framework for growers and retailers to apply on-site in the management of myrtle rust on plants from the Myrtaceae family. It is recommended that the industry apply this plan to all plants from the Myrtaceae family not only those that have been currently identified as hosts.

The general symptoms of myrtle rust/ guava rust include:

- Small purple flecks with a faint chlorotic (yellow) halo on leaf surfaces
- Large purple lesions as a result of flecks coalescing
- Purple lesions and bright yellow rust pustules (spores)
- Bright yellow rust pustules (spores) on underside of the leaf (young infection)
- Bright yellow rust pustules (spores) on both sides of the leaf (mature infection)
- Small and large purple lesions and leaf distortion (twisting)
- Older lesions can contain brown/grey rust pustules (older spores) on the lesions

Myrtle rust can move across the landscape and within a production system by:

- Vegetative material (alive or dead)
- Air movement of spores
- Human assisted movement (spores on clothing/vehicles/containers/etc)
- Water splash from rain and irrigation
- Animals both native and domestic

Image sourced Qld DEEDI

Myrtle rust on Beach Cherry (*Eugenia reinwardtiana*) foliage (heavy infection)

The following simple strategies should be applied (where possible) across all businesses growing/selling myrtle rust host material (Myrtaceous species). It is further recommended to consider this program for all plants within the Myrtaceae family:

Production Nursery (including propagation)

- Ensure a high standard of awareness of the disease at all staff levels.
- Advise staff to avoid any plant contact prior to arriving at work .
- Have on-site disease (myrtle rust/guava rust) identification information for all staff.
- Train staff on disease identification & good hygiene practices (see State biosecurity websites and Nursery Paper December 2004 Issue No: 11 at www.ngia.com.au).
- Disinfest all equipment/vehicles that move off-site and return to operate within the production area.
- Limit the access of people (visitors & staff) to your production areas.
- Implement a hygiene protocol for essential visitors (contractors, etc) to production areas including awareness of previous work sites, inspection of clothing/tools, etc and if required provide disposable overalls while on-site.
- Restrict all non-business vehicles from entry to production areas, disinfest if required on-site.
- Remove myrtaceous plants from driveways and carparks or prune to avoid possible visitor contact.
- Consolidate all myrtaceous plant species within a defined area on-site away from native or landscape planted myrtaceous plant species and avoid direct exposure (buffer) to the prevailing winds of the season.
- Allocate specific staff to manage all myrtaceous species.
- Source myrtaceous plant material from known professional growers (e.g. NIASA Accredited).
- Request all suppliers of myrtaceous plant material provide evidence that they are adhering to the **Australian Nursery Industry Myrtle Rust Management Plan** (see declaration page 15 of the plan).
- Inspect and treat (curative fungicide) imported myrtaceous species prior to incorporating into growing areas (7 days and re-inspect). It is recommend this be applied irrespective of the source.
- **Inspect all myrtaceous species prior to despatch.**
- Monitor all myrtaceous plant species weekly across growing areas for disease symptoms (particularly inspect areas of crop that have high humidity e.g. centre of batch and on the side exposed to prevailing winds).
- Ensure growing areas remain free of all waste vegetative material.
- Periodically (monthly) survey myrtaceous species growing on-site or along property boundaries/ roads/etc. Pay particular attention to plants located upwind based on the most common prevailing wind direction of the season.
- **Implement a fortnightly fungicide treatment program across all myrtaceous plants.**
- Treat the growing area with a disinfectant upon the completion of the crop growing cycle prior to placing a new crop down on the production bed.
- Dispose of all extraneous vegetative plant material from crop management such as pruning, detailing or from natural desiccation via bulk waste, composting or deep burial.
- Assess irrigation system and timing to ensure plant surfaces are dry within a short period (less than 6 hours) after irrigation. Avoid irrigating late afternoon which allows water to sit on surfaces for periods of 6 hours or more during the night. Consider installing drip/capillary or other under canopy irrigation system to myrtaceous plant species.
- Access industry guidelines such as NIASA and **BioSecure *HACCP*** for guidance in developing monitoring/surveillance/inspection programs and recording templates.
- Treat myrtle rust infected plants (per batch) with an approved curative fungicide (**see Australian Nursery Industry Myrtle Rust Management Plan**) twice in **14** days before resuming trade in the infected batch.

Propagation (specifics)

As above plus:

- Maintain high health practices in propagation (surface/implements/ equipment disinfestation, staff hygiene, etc)
- Staff to wash hands before commencing work in propagation area (start of day/after breaks/etc) using a recognised hand sanitation product.
- Propagation staff to undertake any field activities at end of day and not to re-enter propagation area.
- If possible provide staff with clothing or coveralls (e.g. disposable overalls) for moving outside propagation into production areas if required.
- Avoid using adsorbent surfaces such as timber, cement board, fibro, etc as propagation work surfaces unless covered with 200 micron thick black plastic (replace when cut/punctured/damaged).
- Regularly disinfest propagation surfaces throughout the day at various points such as upon returning from a break, a change of species or batch.
- Disinfest all items including surfaces using a recognised industry disinfectant.
- **Avoid sourcing vegetative propagation material from myrtaceous plant species off-site.**
- Ensure **off-site** mother stock for **non-myrtaceous** plant species are inspected and not located within 10m of myrtaceous plants.
- Prior to taking vegetative propagation material from **off-site** motherstock survey the area and inspect all myrtaceous plants for signs of myrtle rust.
- Mother stock must be monitored and inspected at weekly intervals.
- **Implement a fortnightly fungicide treatment program across all myrtaceous motherstock (see recommended program(s) in the Australian Nursery Industry Myrtle Rust Management Plan).**
- All myrtaceous vegetative cuttings should be dipped in a bath containing a recognised disinfectant prior to sticking or an approved fungicide. NOTE: Test on a sample to ensure the product is not phytotoxic to your plant species.
- Consolidate all myrtaceous plant species within propagation houses (dedicated house) and hardening off/growing areas.
- Monitor and inspect struck cuttings on a weekly cycle (see monitoring process in the **Australian Nursery Industry Myrtle Rust Management Plan**).
- **Implement a fortnightly fungicide treatment program across all myrtaceous plant species in propagation houses and hardening off/growing areas (see recommended program(s) in the Australian Nursery Industry Myrtle Rust Management Plan)**.
- Treat the growing area with a disinfectant upon the completion of the crop growing cycle prior to placing a new crop down on the propagation bed/bench and production bed.
- Treat myrtle rust infected plants (per batch) with an approved curative fungicide (see **Australian Nursery Industry Myrtle Rust Management Plan**) twice in **14** days before resuming trade in the infected batch.

Image sourced Qld DEEDI

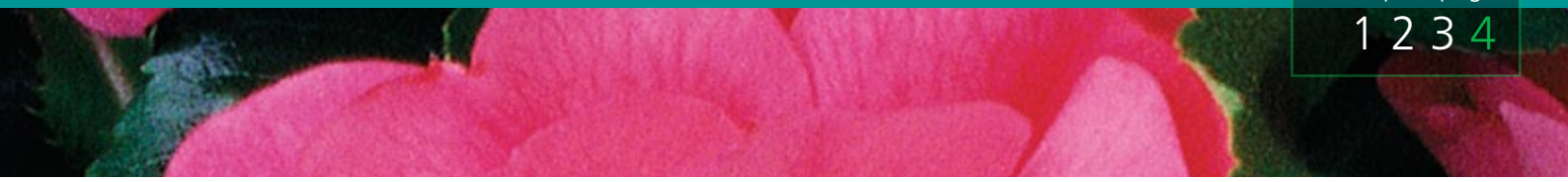
Myrtle rust on Beach Cherry (*Eugenia reinwardtiana*) foliage

Image sourced Qld DEEDI

Myrtle rust on Beach Cherry (*Eugenia reinwardtiana*) fruit

Greenlife Markets/Retailers

- Ensure a high standard of awareness of the disease at all staff levels.
- Advise staff to avoid any plant contact prior to arriving at work .
- Have on-site disease (myrtle rust/guava rust) identification information for all staff.
- Train staff on disease identification & good hygiene practices (see State biosecurity websites and Nursery Paper December 2004 Issue No: 11 at www.ngia.com.au).
- Restrict all non-business vehicles from entry to greenlife stocking areas.
- If possible remove/prune myrtaceous plant species from carparks, driveways, etc that could come into contact with staff and customers or could overhang greenlife stock.
- If possible allocate specific staff to manage all myrtaceous species.
- Request all suppliers of myrtaceous plant species to certify the plant material is grown under the **Australian Nursery Industry Myrtle Rust Management Plan (see www.ngia.com.au)**.
- **Inspect <u>all</u> plant material at receival point with a close inspection of all myrtaceous plant species**.
- Consolidate all myrtaceous plant species within a defined area on-site away from native or landscape planted myrtaceous plant species and avoid direct exposure (buffer) to the prevailing winds of the season.
- Keep all areas stocking myrtaceous plant species free of waste vegetative material such as leaves/flowers/fruit etc dropped by plants.
- Periodically, if possible, apply a recognised disinfectant treatment at monthly intervals over holding area(s) where myrtaceous plant species are stocked/placed/held.
- Conduct weekly monitoring inspections of all myrtaceous plant species .
- Periodically (monthly) survey myrtaceous species growing on-site or along property boundaries/roads/driveways, etc. Pay particular attention to plants located upwind based on the most common prevailing wind direction of the season.
- Dispose of all extraneous vegetative plant material from crop management such as pruning, detailing or from natural desiccation via bulk waste, composting or deep burial.
- Have staff inspect all myrtaceous plant species at paypoint(s).
- Assess irrigation system and timing to ensure leaf surfaces are dry within short period after irrigation. Avoid irrigating late afternoon which allows water to sit on surfaces for periods of 6 hours or more during the night. Consider installing drip/capillary or other under canopy irrigation system to myrtaceous plant species.
- Access industry guidelines such as NIASA and **BioSecure *HACCP*** for guidance in developing monitoring/surveillance/inspection programs and recording templates.
- Treat myrtle rust infected plants (per batch) with an approved curative fungicide (**see Australian Nursery Industry Myrtle Rust Management Plan**) twice in **14** days before resuming trade in the infected batch.



Approved fungicides (PER12156)

Fungicide trade name	Active constituent	Fungicide activity	Chemical group (Mode of Action)	Minimum re-treatment interval between consecutive applications
BAYFIDAN 250 EC FUNGICIDE (PER12156)	TRIADIMENOL	Systemic, curative and protectant	3	14-21 days
SAPROL FUNGICIDE (PER12156)	TRIFORINE	Systemic, slightly curative and protectant	3	7 days
IMTRADE MANCOZEB 750 DF FUNGICIDE (PER12156)	MANCOZEB	Non-systemic protectant	M3	7 days
AMISTAR 250 SC FUNGICIDE (PER12156)	AZOXYSTROBIN	Systemic, slightly curative and protectant	11	14-21 days
COPPER OXYCHLORIDE (PER12156)	COPPER OXYCHLORIDE	Non-systemic protectant	M1	7-14 days
PLANTVAX 750 WP FUNGICIDE (PER12156)	OXYCARBOXIN	Systemic, curative and protectant	7	14 days
TILT 250 EC FUNGICIDE (PER12156)	PROPICONAZOLE	Systemic, curative and protectant	3	7 days
BRAVO (Registered)	CHLOROTHALONIL	Non-systemic, slightly curative and protectant	M5	7 – 14 days

Disposing of plant material infected with myrtle rust:

1. Treat affected plant with an approved fungicide 3 – 4 days prior to disposal.
2. Wear appropriate personal protection equipment (gloves, etc) when handling treated plant material.
3. If plant is small enough enclose plant/container in plastic bag and seal, enclose in second bag and seal.
4. Dispose of in general waste – **DO NOT** dispose of in green waste stream.
5. Larger plants can be treated with an approved fungicide and pruned, double sealing material in plastic bags.
6. Dispose of in "General Waste" stream not green waste.

Please ensure you stay relevant to your state/territory Biosecurity Agency myrtle rust legislative reporting requirements.

Image sourced Qld DEEDI

Myrtle rust on Blushing Beauty Myrtle (*Austromyrtus inophloia*) leaf

Further information

For more detail in managing myrtle rust please download the Australian Nursery Industry **Myrtle Rust Management Plan 2011** from www.ngia.com.au

To report emergency plant pests contact - **Exotic Plant Pest Hotline: 1800 084 881**

Compiled and edited by Matthew Carroll, NGIA Industry Communications; banner photography by Anthony Tesselaar.