

# Managing blueberry rust in a cool climate

## 2024 Update

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## Blueberry rust research in Tasmania

New research is underway to develop farm ready strategies for the prevention and management of blueberry rust in Tasmania.

Blueberry rust in Tasmania is caused by the fungus *Pucciniastrum minimum* (formerly *Thekopsora minima*). It was declared endemic in Tasmania in 2022 due to widespread disease detections in the 2021/22 season. Preventing blueberry rust infection is key to limiting the impact of this disease on productivity and market access.

The research aims to answer key questions that will help develop new strategies for managing blueberry rust.

### Key issues

**Managing overwintering rust** on evergreen & semi-evergreen cultivars



### Research Goal

Break the rust lifecycle

**Understanding the environmental conditions** for blueberry rust survival & infection



Identify when & where high risk conditions occur for spore survival and infection

### KEY POINTS

- **Defoliation** of Legacy blueberry with copper sulphate or a combination of urea + copper sulphate achieved almost complete defoliation but produced unacceptably low yields (around 20% of untreated plants). Hand defoliation did not affect fruit yield.
- **Defoliation with Protone**, a growth regulator, will be tested in 2024/25 after promising defoliation and yield results in the Year 1 screening trial. If successful, it could provide a useful on farm strategy to break the rust lifecycle in semi-deciduous cultivars.
- **Spore survival studies:** Researchers have refined techniques for germinating rust spores on growth media and tested methods for distinguishing living and dead spores.
- **Mapping blueberry rust risk** will continue with the collection of blueberry growth stage data and detailed climate data.



# Managing overwintering rust

## Breaking the rust lifecycle

To break the rust life cycle, we are gathering information on:

1. How to safely remove all leaves from semi-evergreen blueberries without impacting yield.
2. How long do blueberry rust spores and mycelium survive in different environments?

## Defoliation studies

An initial field screening trial in May 2023 with Legacy included the following 4 products:

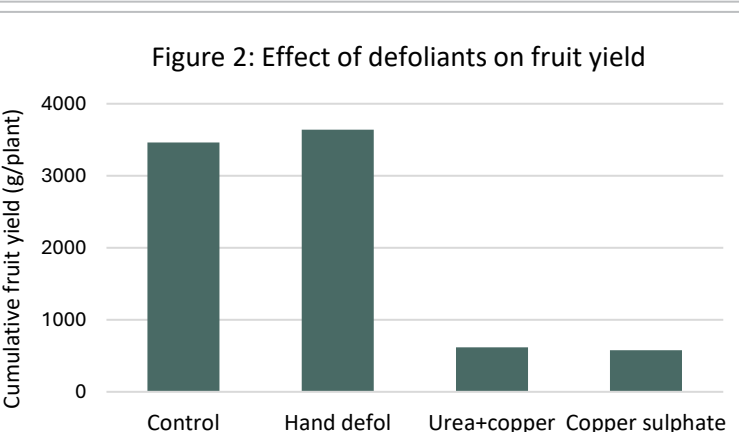
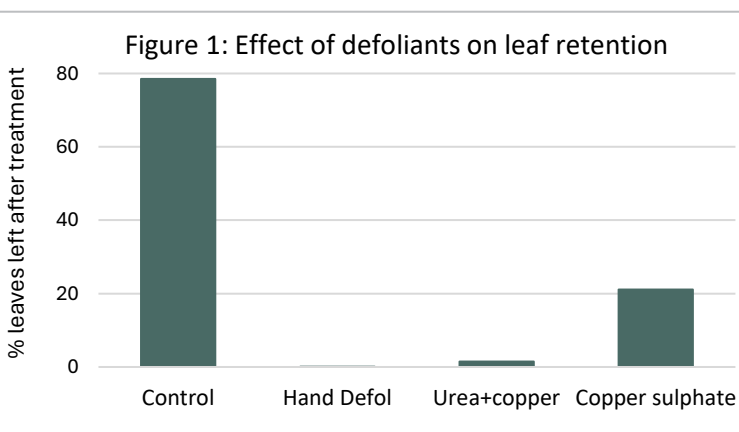
- **Protone** – the plant growth regulator s-abscisic acid,
- **Urea + Copper** – urea followed in 7 days by urea + copper sulphate
- **Ethephon** – a plant growth regulator used to promote ripening
- **Copper sulphate** a traditional defoliant

Protone and Ethephon were not included in the full trial that followed due to inconsistent defoliation.

### Full defoliation trial

This study with Legacy commenced in mid-June 2023. Excellent defoliation was achieved with urea + copper. The copper sulphate treatment achieved slightly less defoliation with around 20% of leaves remaining on the bush (Figure 1).

Unfortunately, both chemical defoliants reduced fruit yield by around 80%. (Figure 2). We think that Legacy flower buds were still physiologically active making them highly sensitive to the defoliant chemicals at the time of spraying.



## Spore survival

This study is being conducted in NSW by Dr Jay Anderson due to the greater availability of fresh rust spores and mycelium.

Getting blueberry rust spores to germinate on artificial media has proved very challenging. The team are working through a range of techniques to optimise spore germination. To side-step this process, a staining technique is being trialled that gives a visual indication as to whether spores are alive or dead (red is dead, green is living)



## Understanding the environmental conditions for blueberry rust survival & infection

The aim of this research is to produce risk maps that indicate where blueberry rust is likely to survive and when it is likely to cause infection. To do this we want to understand when leaves expand and become susceptible to infection.

We collected weather data from 4 blueberry production sites whilst also recording plant growth stages from bud swell onwards. The preliminary models have been developed and will be road tested next season to validate the models.

## What's next – 2024/25

### Defoliation

Protone will be trialled but with earlier application in April when temperatures are warmer. This product showed potential in the screening trial with no apparent impact on yield but requires warmer temperatures to achieve full defoliation.

### Spore survival

With a more reliable method for assessing spore survival, the research team will investigate how different environmental conditions affect both spore and mycelium survival.

### Mapping blueberry rust risk

In 2024/25 we will repeat growth stage assessments at key sites to validate the models of blueberry rust overwintering and infection risk.