New on farm strategies for blueberry rust

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Background

Blueberry rust, caused by the fungal pathogen *Thekopsora minima*, can reduce yield and fruit quality. It reduces leaf area and function, causes premature defoliation and in severe cases, forms pustules on fruit.

Distribution

Blueberry rust is endemic along the eastern seaboard of Australia , including NSW, Qld and Victoria. It was first detected in Tasmania in 2014 but has been contained to 17 sites (April, 2022) including both commercial and non-commercial blueberries.   Biosecurity Tasmania has managed the containment program and retained market access for commercial blueberry growers through site management protocols and property freedom surveys.

New study to develop on farm strategies

 A new 3 year study beginning in 2023 will test on farm strategies to help prevent and manage blueberry rust in Tasmania. This builds on a current Tasmanian Institute of Agriculture study that is trialling alternative crop protectants for organic growers.

KEY POINTS

- **Defoliation studies,** aimed at breaking the rust lifecycle, will measure the impact of short term (8-10 week) defoliation on plant health, bud development, fruit yield and quality.

- **Blueberry rust survival** will be assessed under a range of environmental conditions in both the laboratory and field.

- **Blueberry rust survival and infection models** will help growers and surveillance teams identify when and where there is a risk of blueberry rust infection and its likely persistence overwinter.

- Growers will be able to use blueberry rust infection models and local weather data to identify **when there is a high risk of blueberry rust infection**

- **Rust survival models** will help growers decide whether defoliation is likely to be an effective strategy to prevent blueberry rust over-wintering in their orchard.

Image caption: *Bright yellow blueberry rust pustules on the underside of blueberry leaves (M Simpson)*

The project team will tackle two key issues facing management of blueberry rust in Tasmania:

1. Managing rust on semi-evergreen and evergreen cultivars where infection persists on leaves over winter

2. Understanding what environmental conditions are optimal for blueberry rust survival and infection and relating these to both climatic conditions in Tasmania and the cultivars grown

Melinda Simpson (NSW Department of Primary Industry) and Dr Jay Anderson (Southern Cross University) assessing blueberry leaves for rust infection

Defoliation studies

The research will test practical solutions to minimise or eliminate the carry over of rust from season to season on evergreen and semi-evergreen cultivars. Different methods of defoliation will be tested including organic and conventional products with the aim of achieving 8- 10 weeks of complete defoliation. The best products will be tested in commercial orchard environments to measure the impact on bud development, fruit yield and quality over two seasons.

Blueberry rust survival and infection

Knowing the exact environmental conditions needed for blueberry rust survival and infection will help identify higher risk sites and weather conditions.

We will assess the survival of blueberry rust spores (urediniospore) and mycelium (fungal filaments) under a wide range of temperature, moisture and light conditions. The initial study will be under precisely controlled conditions. Survival models developed from this information will be field tested to 'ground truth' or validate the results in year 3.

Is Tasmanian rust similar to NSW blueberry rust?

DNA sequencing will compare Tasmanian and NSW rust populations. This will allow us to confidently use the data from NSW blueberry rust survival studies to develop management strategies for Tasmanian blueberry rust.

Defoliated blueberry

Timing and location of blueberry rust risk

We will collect detailed climate data from five Tasmanian blueberry farms. This will be matched to records of when blueberry leaf emergence and leaf fall occur.

Identifying when and where there is a likely risk of rust infection will be modelled by combining climate and leaf data with detailed knowledge of the environmental conditions needed for rust survival and infection.

The models will also indicate the risk of where blueberry rust could survive winter conditions. This will help focus blueberry rust surveillance to high risk locations.

Tools for blueberry growers

Growers will be able to use the blueberry rust infection model with local weather data and weather forecasts to identify when there is a risk of blueberry rust infection.

The rust survival model will help growers decide whether defoliation would be a useful strategy to prevent blueberry rust over-wintering in their orchard.

Southern Cross University

Tasmanian Government

Fruit Growers Tasmania