Verticillum dahliae host range

THE ACDC
The Australian Cotton Disease Collaboration

Filling in the gaps and understanding crop sequence impact in field

Overview

This research is helping build the knowledge growers need to make more informed crop rotation decisions and better manage Verticillium wilt risk.

This project will:

- Identify which crops and weeds can host *Verticillium dahliae* and contribute to inoculum carryover between crops.
- Improve understanding of how different crop sequences influence disease risk, inoculum levels, and wilt severity over time.
- Identify lower-risk rotation options that help reduce the impact of Verticillium wilt in cotton farming systems.
- Track how pathogen levels in soil change across seasons, providing insights into disease build-up and decline.
- Determine whether *Verticillium dahliae* from non-cotton hosts remains capable of causing significant disease in cotton.
- Provide practical, evidence-based information to support crop rotation and disease management decisions on-farm.

Where are we up to?

- Previous research in Australia and overseas has shown that *Verticillium dahliae* can infect a wide range of crops and weeds, highlighting the importance of crop rotation choices in managing disease risk.
- A review of current knowledge on the host range of key soilborne pathogens affecting Australian cotton is being finalised and will help inform future research and extension activities.
- Glasshouse trials are underway to identify whether additional rotation crops can host *Verticillium dahliae* and contribute to disease carryover between cotton crops.
- Data from two long-term rotational trials at ACRI, Narrabri, have been analysed to measure Verticillium wilt severity and changes in pathogen levels in the soil under different crop sequences.
- *Verticillium dahliae* isolates are being collected from non-cotton hosts to determine their ability to survive, reproduce, and cause disease in cotton.



Verticillium wilt vascular discolouration in cotton stems

This research will help growers make more informed crop rotation decisions to reduce Verticillium wilt risk and improve the long-term productivity of their farming systems.

The right rotation choices can influence disease levels for years to come. This research will identify lower-risk rotation options, helping growers reduce Verticillium carryover, maintain yield potential, and build more resilient and profitable cotton farming systems.

Next steps

1. Complete glasshouse trials to identify additional crops that can host *Verticillium dahliae* and contribute to disease carryover.
2. Continue monitoring the long-term trials at ACRI during the 2026-27 season to track disease levels and changes in soil inoculum.
3. Link pathogen levels in the soil with Verticillium wilt incidence and severity to better understand disease risk under different rotation crops.
4. Assess the ability of *Verticillium dahliae* isolates from non-cotton hosts to survive and cause disease in cotton.
5. Share project findings with growers, advisors, and industry through field days, workshops and extension resources.

This work is building the evidence needed to identify lower-risk rotation options and provide growers with practical guidance to reduce Verticillium wilt risk and protect cotton productivity over the long term.

Why is this important ?

Verticillium dahliae produces survival structures (Microsclerotia) that can remain in the soil for more than 10 years, making Verticillium wilt a long-term challenge for affected paddocks. With few effective in-crop management options available, crop rotation is one of the most important tools growers can use to manage disease risk.

Understanding how different rotation crops influence the build-up and decline of *Verticillium dahliae* in the soil will help growers make more informed decisions about crop sequencing, reduce disease pressure, and protect cotton productivity over the long term.

How will this work benefit Australian cotton growers and industry?

This research will:

1. Improve understanding of which crops and weeds can host *Verticillium dahliae* and contribute to disease carryover between cotton crops.
2. Show how different crop rotations influence Verticillium wilt risk and disease severity in cotton.
3. Identify how rotation choices affect pathogen levels in the soil over time.
4. Identify lower-risk rotation strategies that can help reduce Verticillium wilt pressure in cotton farming systems.
5. Track seasonal changes in disease levels and soil pathogen populations to better understand disease dynamics.
6. Determine whether *Verticillium dahliae* from non-cotton hosts can survive, spread, and cause disease in cotton.

Find out more

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