

11.1 Background

All major grain crops, pulses and pastures grown across Australia can host and be infected by the pathogen Pythium, which causes seedling damping-off and root rot. Pulses and canola are highly susceptible to Pythium root rot, with wheat and barley significantly less susceptible.

Pythium is ubiquitous in Australian cropping soils, but is more prevalent in regions with an annual rainfall above 350mm. Areas with higher levels of organic matter, acid-neutral soils and under reduced tillage systems are also more likely to encounter the pathogen.

IMPACT

- A national four year trial demonstrated that a 25% reduction of Pythium inoculum lead to an 11% increase in grain yield, averaged across several crops.
 - Decreased soilborne Pythium inoculum (-25%) and Pythium root infection (-23%)
 - Increased emergence of wheat (+6%), canola (+3%), lupins (+13%) and peas (+2%)
 - Increased grain yield of wheat (+4%), canola (+12%), lupins (+26%) and peas (+11%)
- Roots damaged by Pythium are more vulnerable to infection of other pathogens such as Rhizoctonia and Fusarium.
- Loss of root hairs in legumes due to Pythium reduces nodulation and nitrogen fixation.
- Individual yield responses varied between seasons and rotation strategy.

WHERE DAMAGE IS MORE LIKELY

- In cold, wet seasons, particularly in acidic-neutral soils with high levels of organic matter.
- Poor weed control, including sowing before herbicide treated weeds have fully decomposed.
- Disease incidence is greater after long-term pastures (legume) and in less diverse rotations, such as repetitive wheat - canola and to a lesser extent, wheat-canola-legume sequences.
- More diverse rotations that include two non-consecutive cereals e.g. wheat > canola > barley > legume had lower disease incidence and greater grain yields overall, compared with the less diverse rotations.

WHY TEST?

- If medium or high Pythium levels are anticipated and/or detected:
 - Treat seed with a Pythium-selective chemical
 - Plant less susceptible crops
- The PREDICTA B test under evaluation for Pythium clade f detected 3 of the 7 root pathogenic Pythium species isolated from cropping trials (2002 to 2010) including the dominant species *Pythium irregulare*.
- A non-quantitative ELISA test is available to detect the presence of Pythium in soils and roots.
- In-crop symptoms of Pythium root rot can be mistaken for rhizoctonia root rot.

Seed treatments containing metalaxyl-M are registered for suppression of Pythium seedling “damping off” and root rot in grain and horticultural crops. There are no post emergent treatments registered for suppression of Pythium root rot.



IMAGE: CSIRO

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