

Pachymetra root rot

Pachymetra chaunorhiza

Introduction

Pachymetra root rot is a sugarcane disease unique to Australian cane fields. The disease is not seen in any other country, or in fields where sugarcane has not been previously grown. The disease greatly reduces root growth and yields in susceptible varieties. Pachymetra root rot is a major disease in many parts of Queensland and New South Wales. It is important that appropriate controls are implemented to minimise losses.

Causal organism

The disease is caused by a fungus-like organism, *Pachymetra chaunorhiza*.

Symptoms

Affected root systems typically exhibit a soft, flaccid rot of the larger roots, and are much smaller than healthy root systems. The fungus invades individual roots, usually near the root tip, and breaks down the internal root tissues. These roots either stop growing, or are completely destroyed. This leads to a poorly developed root system and a loss of stool anchorage, which may give rise to excessive stool tipping. Root reddening may accompany the early stages of Pachymetra infection.

Yield loss

Yield losses of up to 40% in susceptible varieties have been associated with the disease.

Management

Pachymetra root rot control is based on strategic planting of resistant varieties. Some Australian varieties have good resistance to the disease, and, in the production of new commercial varieties, use is made of resistant parents. All varieties are screened for resistance before release, and highly susceptible varieties are not considered for commercial production in badly affected districts.

The resistance ratings for all approved varieties are available from your nearest SRA office, or from the SRA website (sugarresearch.com.au) and select the QCANESelect™ tab on the menu.

Short-term fallows (<12 months) have minimal effect on Pachymetra root rot; exposing soil to direct sunlight also has a minimal effect on Pachymetra. Pachymetra spores are long lasting and can survive for more than five years in the soil. Rotation crops such as soybean do not directly affect Pachymetra but have other beneficial effects on soil health. No fungicides are effective against Pachymetra at economical rates.

Pachymetra can spread from field to field in soil carried on machinery or attached to stalks of cane. If your farm or district is free of Pachymetra you should wash down machinery before it enters your farm. Unlike other Peronosporomycetes, Pachymetra is not carried long distances in water.



Typical effect of Pachymetra root rot on the thicker sugarcane roots.



Pachymetra root rot is caused by a fungus that principally affects the primary and secondary roots of the cane plant, giving rise to a watery rot.

Soil tests

A soil assay for Pachymetra root rot, based on counting spores of the fungus in field soil, can be used to determine the likely severity of the disease in commercial fields. Surveys of Queensland cane fields suggest that the Northern district, and some parts of the Herbert, central and southern (Bundaberg) districts and Fairymead districts are badly affected. The disease is widespread in northern, Herbert, and central Queensland districts, with limited distribution in southern Queensland, Burdekin and NSW canegrowing areas.

Soil samples for assay in a standing crop should be taken from 0-25 cm depth in the soil profile, within the cane row (not from the inter-row space). Enough samples should be taken to

ensure representative results are obtained (for example 8-10 sites within a field). The spore counts in the table below reflect probable disease severity in susceptible varieties, depending on whether soil was collected from a fallow field (cultivated) or a standing crop.

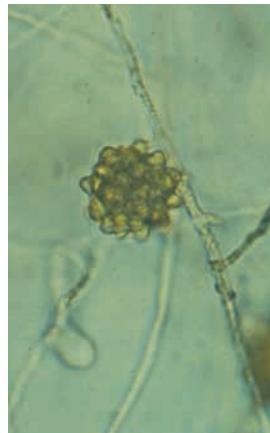
Where counts are medium or high, the growth of more-resistant varieties should be considered. In badly affected districts, it may be preferable to grow only highly resistant varieties or highly resistant varieties every second crop, in rotation with varieties with intermediate resistance.

Further information

For further information contact your local adviser.



This photo illustrates the effect of Pachymetra root rot on a susceptible variety (Q83), and the better root growth in the resistant variety (Q78).



A characteristic oospore of Pachymetra illustrating the large blunt projections on the spore wall.



Pachymetra-infected stool.

Probable disease severity	Fallow field	Standing crop
Low	0 - 30,000 spores/kg	0 - 50,000 spores/kg
Medium	30 - 60,000 spores/kg	50,000 - 100,000 spores/kg
High	> 60,000 spores/kg	> 100,000 spores/kg