

Sugar cane poor root syndrome in far north Queensland

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Poor or restricted root growth in sugarcane (Saccharum interspecific hybrid) growing in far north Queensland has been responsible for serious and increasing losses in the past years. Roots show discolouration, leading to a soft, flaccid rot of the cortex, various lesions and a poorly developed fine root system. The cane plant shows unthrifty growth, wilting when exposed to mild moisture stress and a tendency to tip from the ground when mature. This latter symptom causes deterioration of the crop, processing problems in the sugar mill and losses in subsequent ratoon crops due to root stock removal by mechanical harvesting. A coordinated programme was commenced in 1980 to find the cause and solution.

Initial studies confirmed that biological agents had a major involvement. Advice of specialists from outside organisations resulted in the concentration of field research at two sites, laboratory and glasshouse facilities were expanded and definitive trials commenced to determine the relative importance of pathological, entomological, agronomic and varietal factors (1).

Poor root syndrome was found to occur in a wide range of soil types throughout the landscape of the super wet belt between Babinda and Tully. Two major fungal pathogens have been isolated (2). Pythium arrhenomanes destroys the fine roots and produces lesions on larger roots, while an unidentified Oomycete, which produces characteristic ornamented oogonia, causes soft rot of the major roots.

Etiology studies were conducted in the field (3) and pots (4). The following factors which in some cases gave an improvement in cane growth, did not inhibit attack by the fungal pathogens:- control of soil microfauna including nematodes (5), improved soil nutrition (6), broadcast fertiliser application elevated pH (6), fallowing (6), organic matter (1), removal of soil compaction (6) and fungicides (6). The addition of ten per cent affected soil to unaffected or sterilised soil will transmit the root rot symptoms.

Erratic symptom expression in glasshouse trials was found to be due to severe depression of symptoms at temperatures greater than 35⁰C. Airconditioned benches which cooled the soil in pots overcame this problem (7). Good field control has been achieved by solar heating of soil under clear plastic sheets and soil sterilisation (6). Resistance has been found in genera related to commercial sugar cane (1).

A range of integrated control methods are currently under investigation, but no short-term practical solution is yet apparent.

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