Controlling Pythium Soft Rot in Ginger

The Issue

Cause
Pythium Soft Rot is caused by the water-mould fungus Pythium myriotylum. It was first identified on the Sunshine Coast in the summer of 2007/08, which had more rain days than any other summer on record. Disease epidemics result when hot, humid conditions coincide with periods of intense rainfall events and/or persistently wet soils.

Symptoms
The first sign of infection is yellowing of leaves and stems resulting in patches of yellowing plants in the field. The base of stems and rhizomes develop a soft rot that causes the stems to collapse and eventually, if the disease continues unabated, the entire rhizome will rot away.

Source of the disease and spread
Soil: Fungal spores are found in contaminated soils and thick-walled oospores can survive in the soil for many years. This has clear implications for the movement of machinery between blocks and the need for hygiene in machinery, implements and footwear.
Water: Surface water draining across fields during heavy rainfall events can spread the pathogen and the motile zoospore is specially adapted for dispersal through water and waterlogged soils when it infects plant tissues and causes disease epidemics.
Seed: Infected rhizomes and sections of rhizome used as planting material (‘seed’) can spread the disease.

Control

Seed Treatment
- Use clean seed from an approved source
- Do not dip seed; spray to waste and ensure cut surfaces have ‘sealed’ which serves as a barrier for disease entry

Drainage
- Cross drains significantly reduce infection levels and act as quarantine barriers inside blocks
- Reduced tillage with rotation crops improves soil structure and water infiltration rates, while reducing compaction and development of anaerobic soils
- Prevent surface water movement from adjacent blocks and prevent ponding of water at edges of blocks
- Vegetative silt traps at dam entry points and foot-valves placed at depth and away from edges of dams reduces risks of spreading disease in irrigation water
- Test for eC in soils as high levels are often indicative of poor internal drainage and lower organic carbon levels

Soil Health
- Rotate with crops that are non-hosts to Pythium myriotylum, that stimulate beneficial microorganisms that suppress Pythium, and with a root system that ‘opens’ the soil
- Winter cover crops, such as oats, and summer cover crops, such as sorghum, have proven their effectiveness in controlling Pythium Soft Rot in ginger
- Organic amendments that increases levels of labile C in the soil helps support diverse microbial communities that improve soil fertility and health
- Preventing pest (nematodes; symphylids) and physical (wind rub; spray) damage to plants reduces entry points for Pythium

Roguing / Spot Spraying
- Early roguing of infected plants and spot spraying using mancozeb/metalaxyl mixes greatly reduces disease establishment and spread
- High volume under canopy application of this mix can also give control when weather conditions increase disease pressure

Fumigation
- Soil fumigation without appropriate mitigation measures to improve soil health are likely to exacerbate Pythium Soft Rot in ginger

Quarantine
- Pythium is spread from farm to farm on infected seed, contaminated soil and even sawdust/manure stored on infected soils. Soil can be spread on vehicles, farm machinery and implements and even on workers’ boots. Contractors and suppliers are not excluded
- Signage needs to be erected at every entry stating the area is a quarantine area with instructions on what to do. Wash-down and runoff areas, as well as footbaths, are needed at strategic areas to prevent disease entry into farms and farm blocks
- Prevent livestock and wild animals from spreading disease from infected blocks. Fence and take care with gates.
- See Quarantine Poster for fuller description of quarantine measures and sterilisation protocols that should be followed to prevent spread of Pythium

This poster has been compiled by Dr Mike Smith and Rob Abbas as part of the Soil Health Project PRJ-008 343.