

# Tackling Root Zone Diseases: Cultural and Biological Controls

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# Contents

- Common root zone diseases.
- IPM strategies for the control of root zone diseases.
  - Biological control: T<sub>34</sub> Biocontrol.
  - Chemical control options.



# Root Zone Diseases

- Roots - Absorption of water and nutrients.
- Can affect plant collars and crowns.
- Abiotic stress increases likelihood.
- Plants from drier climates and ericaceous plants can be very prone to disease.
- 4 key pathogens:
  - *Pythium*
  - *Phytophthora*
  - *Fusarium*
  - *Thielaviopsis*



# *Pythium* and *Phytophthora*

- Oomycetes - Water moulds.
- Spread via contaminated soil, tools, footwear or water.
- Favour excess soil moisture.
- Poor root systems, root decay, shearing of outer root structure. Wilting, yellowing, defoliation, stunting, death.
- *Pythium*:
  - Damping off in seedlings.
  - Not all are plant pathogens.



# *Fusarium and Thielaviopsis*

Fungal plant pathogens

## *Fusarium*

- Ornamental and edible plants affected.
  - Soil-borne.
  - Blocking of xylem - Wilting.
  - Host specific.
- Pink/white spores at base of plant.

## *Thielaviopsis*

- Roots have black lesions with numerous fungal spores.
- Reduced water and nutrient uptake.
- Foliar chlorosis and stunted growth.
  - Slow decline in plant health.



# Integrated Pest Management (IPM)

- Lack of IPM - Resistance, loss of chemical controls.
- Cultural controls - Key importance in preventing root zone disease:

Resistant varieties

Reputable suppliers

Plant checks

Sterilisation - Materials, beds, equipment

Clean water sources

Using clean pots and compost

Correct water, nutrient and pH levels

Grouping of plants with similar needs

Control of other pest organisms

- Biological control options -> Chemicals as a last resort.



# T34 Biocontrol

- An approved, registered biofungicide.
- Preventative activity against a range of root zone plant diseases - Across a wide variety of crops (PPFE).
- Pre-planting, growing media incorporation; root dipping; drench or irrigation treatments.



# T<sub>34</sub> Biocontrol: Modes of Action (MoA)

- Contains spores of the fungus *Trichoderma asperellum* (strain T<sub>34</sub>).
- Colonises the growing media and plant root zone.
- Has three key MoA:
  1. Forms a physical barrier - Competing with pathogens for space and nutrients.
  2. Induces plant disease resistance mechanisms.
  3. Parasitises and kills pathogenic fungal hyphae.



\* T<sub>34</sub> will also establish in the absence of pathogens.





# Chemical Control Options

- The use of chemical plant protection products remains an important control strategy.
  - Chemical control options should be utilised as a last resort.
    - The number of products available is limited.
  - Products must be applied according to the label (and EAMU).
  - Products can only be used when approved for the crop and situation.



# Thank you for listening

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