

Understanding & Managing Pythium Diseases of Vegetables

Len Tesoriero Senior Plant Pathologist

www.dpi.nsw.gov.au

Overview of this presentation – 3 Questions

- What sort of microbes are *Pythium* species?
- Why are they important plant pathogens?
- How can we effectively manage them?

Genetic heritage of *Pythium* **species**

- Historically thought to be a fungus although early taxonomists recognised they had algal features
- Now known to have an algal heritage
- There are >130 species with diverse physical appearance
- Genetically there are 5 different genera
- They have diverse lifecycles & lifestyles
- Key feature are the hairs on the anterior flagellum

Life Cycle of Pythium species



Why are Pythium diseases important?

- They are very common in soils & water
- They can affect all growth stages of plant development
- They attack a wide range of crops some are specialised on certain botanical groups
- They can breed quickly under the right conditions
- Synergists with other plant pathogens & pests in disease complexes
- Synergists with certain herbicides

Types of plant diseases caused by *Pythium* spp.

- Seed decay pre-emergent rot
- Seedling & post-transplant damping-off
- Root rot of feeder roots
- Replant diseases of woody plants
- Wilt disease complexes
- Leaf blight & plant collapse

Pythium spp. seedling diseases



Root rot complex in spinach



Pythium spp. infection of root systems



Pythium root rot in soilless systems



Factors affecting disease severity

- Genetics
- Inoculum density
- Temperature
- Light intensity
- Insect & physical damage
- Nutrition
- Aeration

Interaction between *Pythium* and temperature



Pythium species & host ranges

Species	Main Hosts
P. sulcatum P. mastophorum	Carrot family
P. aphanidermatum P. irregulare P. ultimum P. spinosum	Virtually all vegetables
P. tracheiphilum P. uncinulatum	Lettuce family (also on cucurbits, brassica or tomato seedlings)

Pythium Management

Irrigation/drainage management

Low levels today + irrigation = high population within hours

Nø.

Temperature dependency • alter planting schedules



Biological controlsAffect disease potential



Population can grow very rapidly
1000x increase within a few hours
Current soil sampling not always an accurate indicator of disease potential



