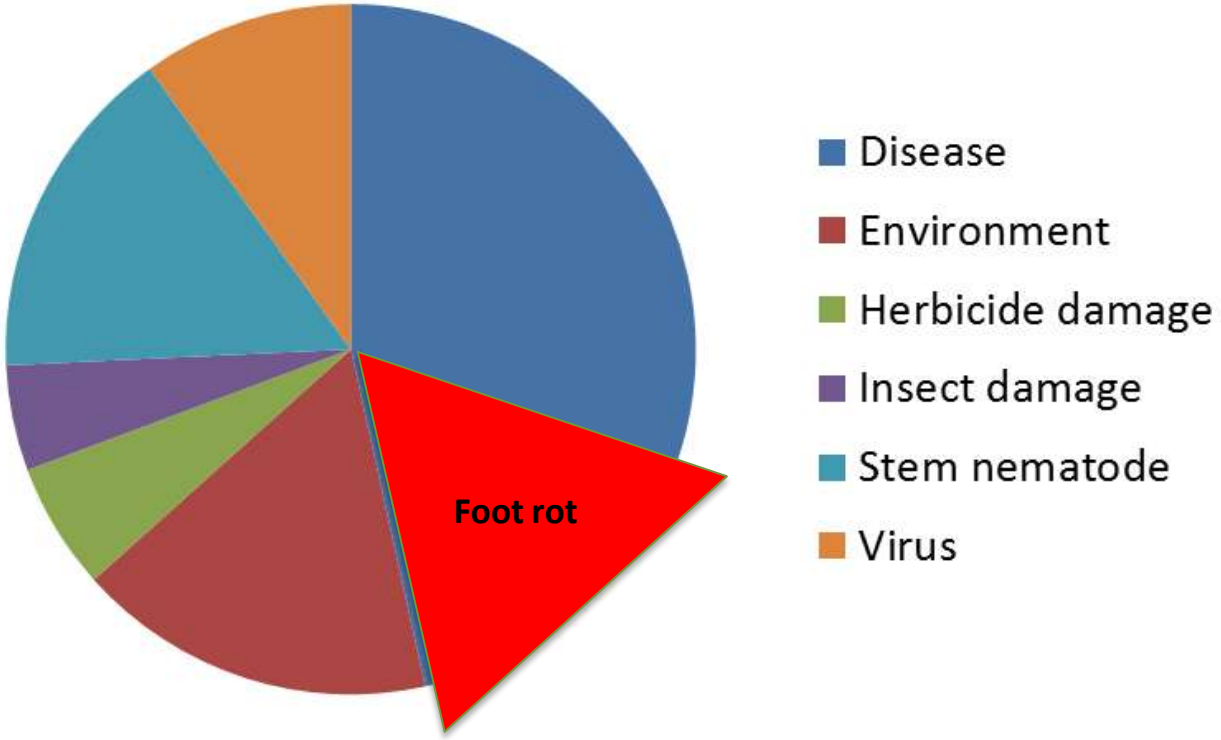
Foot rots in peas and beans

Lea Herold

Crop Clinic 2016



35% of all “disease” samples were foot rot infected plants

Foot rot symptoms

- Poor root system
- Reduced nodulation
- Pale or yellow plants
- Stunted
- Reduced pod fill

➢ Disease complex

Foot rot pathogens – peas

- *Fusarium solani* f.sp. *pisi*
  - Widely distributed across UK
  - Reddening of vascular tissue

- *Fusarium oxysporum* f.sp. *pisi*
  - Traditionally associated with fusarium wilt
  - Isolation of *Fusarium* species from infected pea roots:
    - 30% *F. oxysporum*
  - 2 groups: wilt vs foot rot

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Foot rot pathogens – peas

- *Didymella pinodella* (*Phoma*)
  - Black stem base
  - Breakdown of epidermis
  - Often together with *F. solani*

- *Aphanomyces euteiches*
  - Soft rot of root cortex, honey coloured
  - Rapid disease development
  - High in Scotland, present in Yorkshire, Lincolnshire and Leicestershire

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Foot rot pathogens – beans

- *Fusarium solani*: red-brown vascular tissue
- *Fusarium culmorum*: basal stem rot, black with pink spore mass
- *Didymella pinodella*: blackened stem base

Alternative hosts

- *Fusarium solani* f. sp. *pisi* – Pea, faba bean, phaseolus bean, possibly soya
- *Didymella pinodella* (Phoma) – Fabaceae, including lucerne, pea, some vetches, clovers + beet
- *Aphanomyces euteiches* – Pea, sweet pea, clover, faba bean, lupin, vetch, lucerne

➢ Some weeds may host these pathogens

Conditions encouraging disease

- Cold, wet soils
- Poor soil structure
- Compaction and water logging (release of root exudates)
- Stressed crop
- Frequent legume cropping

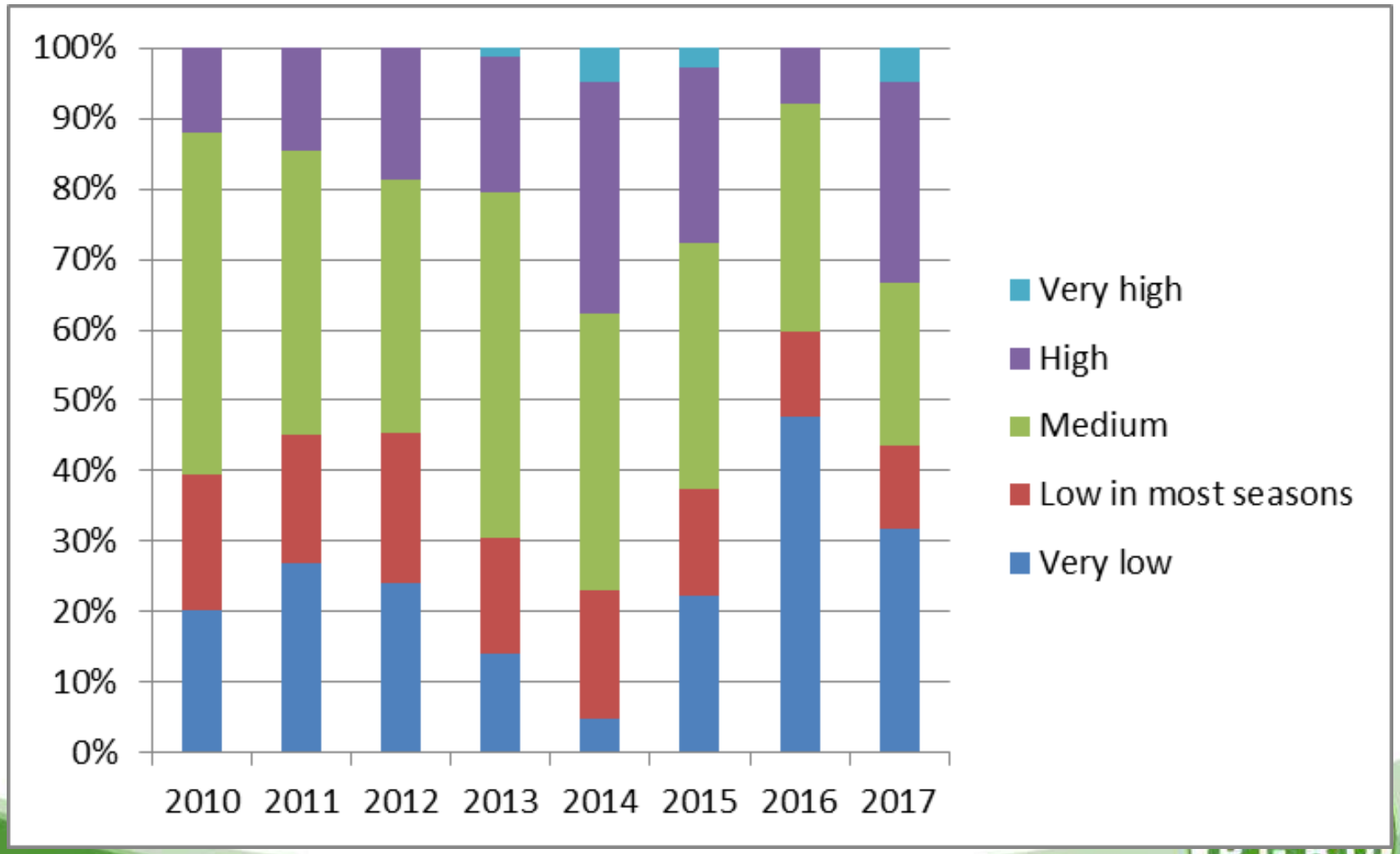
➢ Avoid contamination


Courtesy of S. Chatterton, Agriculture and Agri-Food Canada

Disease management

- No chemical control available
- Lengthening rotations
- Encourage healthy soils
- Soils tests to assess pea pathogen levels – 2 tests available at PGRO

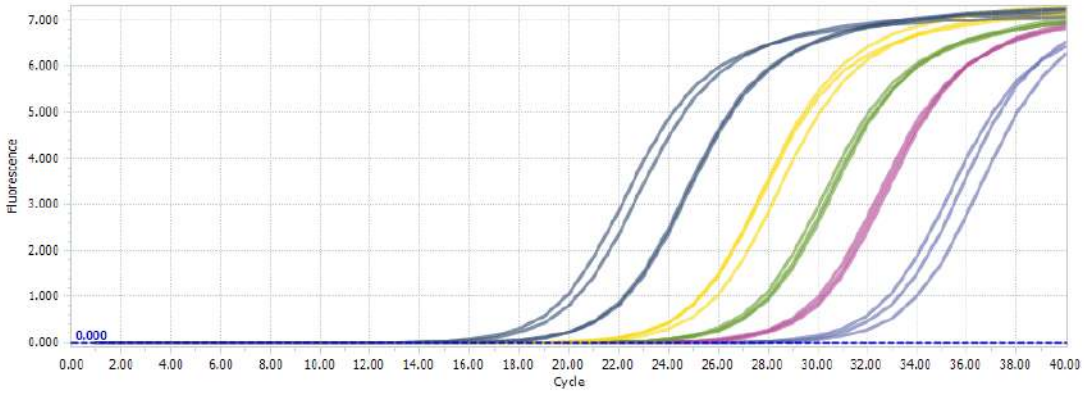
Soil tests

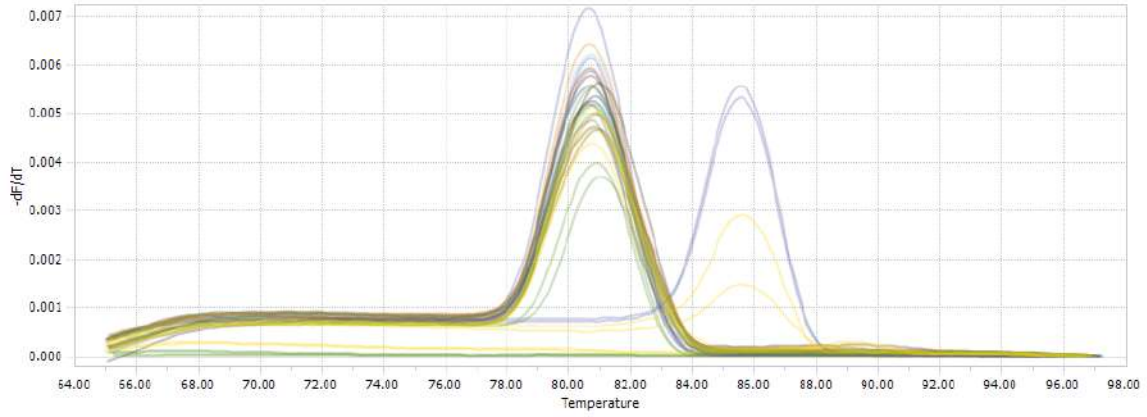


Potential yield loss with each category: 0.6 t/ha

Diagnostic tool

- Risk assessment – quantification of pathogen levels in soils using molecular techniques





PhDs

- Investigating the relationship between *Aphanomyces euteiches* and yield decline in peas – PhD Nottingham University/ PGRO
- Understanding and mitigating against the causes of yield decline in pea – PhD Warwick University/ PGRO – Focus on *Fusarium* sp.

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Thank you

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