

NSW Department of Primary Industries

Sclerotinia – Yield loss quantified and development of a spray decision support model NSW and WA Results - 2013

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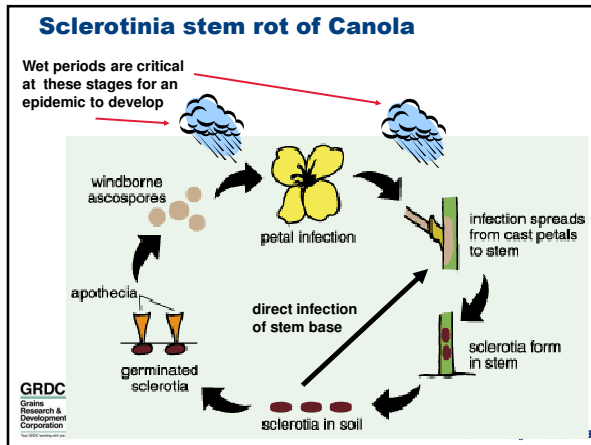
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Sclerotinia stem rot of canola

- **Sporadic disease of canola in Australia**
 - Levels of infection can vary from year to year and between districts
- **The causal pathogen - *Sclerotinia sclerotiorum***
 - Wide host range approx. 400 broadleaf species
 - Difficult to control with crop rotation
 - Produces sclerotia
- **Difficult to accurately predict epidemics of disease**
 - The presence of infected petals does not guarantee development of stem rot
 - Epidemics are driven by humidity and rainfall during flowering

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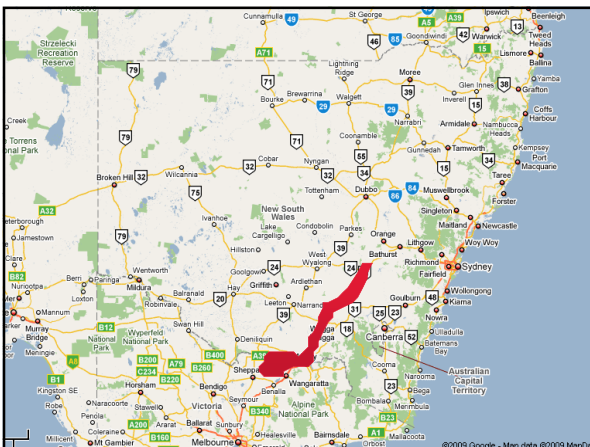
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Observations in 2013

- Mild winter temperatures resulted in early flowering (mid-late July).
- Wet soils in July which favoured apothecia formation
- Epidemics of sclerotinia developed in those districts with a mild, late finish and extended flowering period.
- Infection levels of up to 60% were measured in some crops in southern NSW.
- Paddocks on a tight wheat/canola rotation appeared to be the worst affected

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Project Aims

- Produce a predictive model
 - regional disease alerts can be provided
 - disease risk can be calculated
- Quantify yield loss
 - Advisors/growers can accurately determine yield loss and therefore economics of applying foliar fungicides

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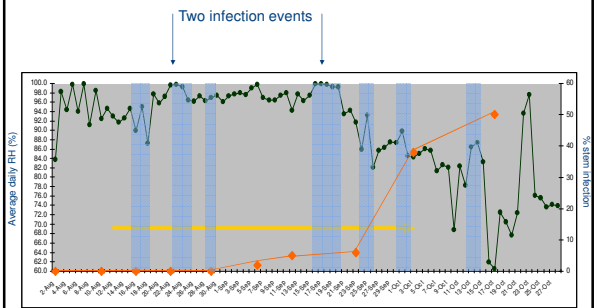
Crop monitoring - 2013

- Commercial crops were monitored for sclerotinia stem rot development
- Howlong, Alma Park, Morven and Cootamundra
- Data loggers used to measure humidity and temperature every 30 minutes (2nd Aug – 28th Oct)
- Crops inspected weekly for disease development
 - Level and type of infection (main stem vs. branch)
- Plant collected for yield analysis
 - Measure impact of main stem vs. branch infection

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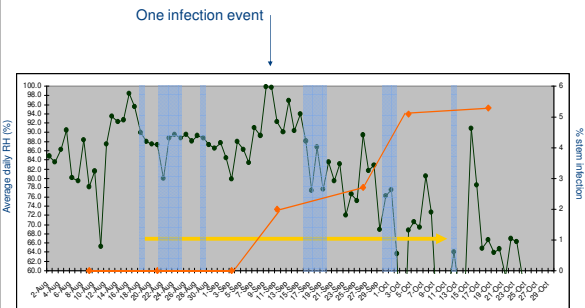
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Sclerotinia stem rot development at Howlong



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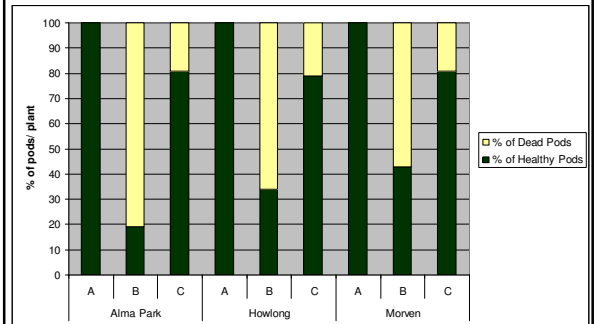
Sclerotinia stem rot development at Cootamundra



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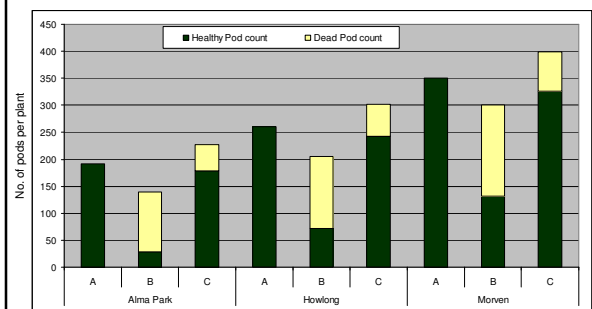
Effect of infection type on podding



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Effect of infection type on pod numbers



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| Site | Infection type | Healthy pod weight (g/pod) | % Yield loss per plant |
|-----------|----------------|----------------------------|------------------------|
| | | 5% LSD = 0.002 | |
| Alma Park | None | 0.0525 a | 0 |
| Alma Park | Main stem | 0.0451 b | 82 |
| Alma Park | Branch | 0.0522 a | 21 |
| Howlong | None | 0.0364 a | 0 |
| Howlong | Main stem | 0.0290 b | 72 |
| Howlong | Branch | 0.0361 a | 19 |
| Morven | None | 0.0457 a | 0 |
| Morven | Main stem | 0.0383 b | 63 |
| Morven | Branch | 0.0454 a | 18 |

Acknowledgements

- Funding providers
 - GRDC
 - NSW DPI
- Wes Amor – Bayer Crop Science
- Sandy Biddulph – Biddulph Rural Consulting
- Bev Orchard – Statistical analysis



2013 WA Sclerotinia trial program

- Sclerotinia survey
- Timing of fungicide application
- Effect of flowering time on the incidence of Sclerotinia
- Yield loss from Sclerotinia
- Epidemiological observations



Sclerotinia stem rot incidence in 2013

- A total of 86 crops/paddocks surveyed
 - Widespread from north to south
 - Average incidence across all samples was 29%.
 - In northern region the incidence ranged between 0-60% , average 26%
 - In worst affected crops yield losses ranged between 0.3-1t/ha (10-50% yield loss).



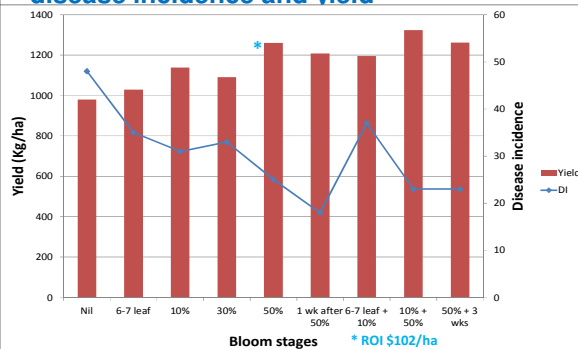
Timing of fungicide application

- Two sites (Eradu and Dalyup*)
- Variety (Cobbler)
- Fungicide Prosaro applied at various bloom stages

*Disease didn't develop in Dalyup trial



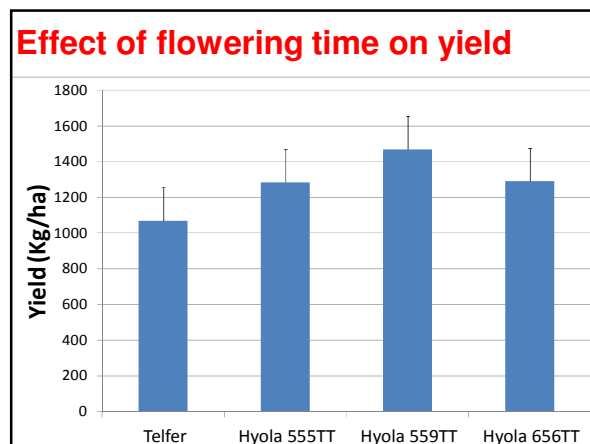
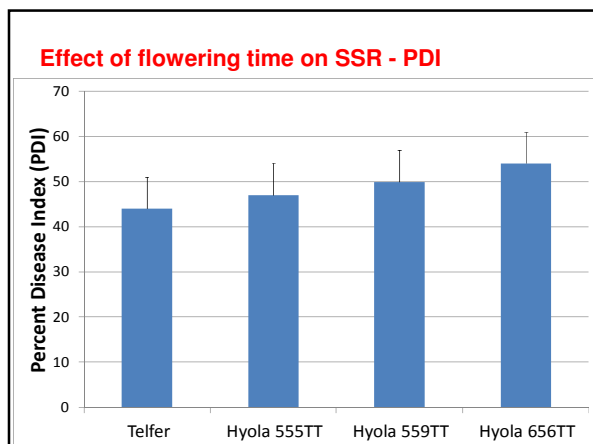
Effect of timing of fungicide application on disease incidence and yield



Effect of Flowering time on Sclerotinia incidence

- Location
 - Eradu
- 4 varieties
 - Telfer
 - Hyola 555TT
 - Hyola 559TT
 - Hyola 656TT





- ### SSR yield loss – individual plant basis
- Two sites
 - Walkaway and Kojonup
 - 20 plants collected in each of the disease categories
 - Healthy
 - Laterals affected
 - Main stem affected but yielding
 - Plant severely affected or almost dead
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- ### Yield loss Results
- | | |
|---|---|
| <ul style="list-style-type: none"> Walkaway Healthy vs Dead = 92% Healthy vs Lateral = 18 % Healthy vs Main Stem = 12%* <p>* Main stem with small lesions</p> | <ul style="list-style-type: none"> Kojonup Healthy vs Dead = 95% Healthy vs Lateral = 31 %** Healthy vs Main Stem = 71%** <p>** Plants in these two categories were much more diseased at this site</p> |
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- ### WA Summary
- Widespread occurrence of Sclerotinia in 2013 resulted in substantial production losses.
 - Late spray application of Prosaro at or after 50% bloom was effective and more economical.
 - In 2013 trials, flowering time had no effect on Sclerotinia incidence.
 - Yield loss from SSR variable in different disease categories with up to 95% loss in severely affected plants.
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