

14. Attempting to Control Aerial Blackleg (branches, flowers and pods) in canola with different timings and rates of Prosaro

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PROJECT ID: GRDC FastTrack Project

KEY MESSAGES

- Trial data from the fast track project is still to be analysed. The following key messages are from trials conducted by Steve Marcroft in conjunction with the fast track project.
- Normal crown canker occurred as predicted, i.e. high leaf infection resulting in crown canker. Fungicides applied at the 4-6 leaf growth stage were effective at reducing crown canker. Cultivar resistance was also very significant.
- Upper Canopy Infection did not develop as badly as anticipated with the many leaf lesions noted early in the season.
- Pod infection was not influenced by fungicide applications up to 30% bloom, but flowering date was very significant.
- Fungicide was effective at reducing Upper Canopy Infection. Fungicide was effective at significantly increasing yield, however the most effective timing for fungicide application was variable for each of the disease symptoms.
- The sclerotinia spray application timing (30% bloom) appeared to be a good timing for Upper Canopy Infection control. However this work needs to be repeated in seasons that are conducive for severe Upper Canopy Infection symptoms.

Background

In 2016 very high levels of leaf infection with blackleg was noted early in the growing season and aerial infection of branches, flowers and pods was anticipated. GRDC funded a fast track project to investigate a range of rates and timings of foliar fungicide to try to reduce the impact of aerial blackleg. A trial was established at Bool Lagoon (in conjunction with a trial on Eyre Peninsula and two trials in western Victoria).

Activities

A trial was conducted at Bool Lagoon with treatments being applied to a commercial crop (Table 1).

Table 1. Prosaro treatments and timings.

Treatment	Application Timing	Rate applied L/ha
1	Green bud	0.375
2	Green bud	0.45
3	20% flowering	0.375
4	20% flowering	0.45
5	30-40% flowering	0.375
6	30-40% flowering	0.45
7	50% flowering (full bloom)	0.375
8	50% flowering (full bloom)	0.45
9	Green bud + 50% flowering (full bloom)	0.375 + 0.375
10	Untreated	Nil

Data Collection

Flower Infection

The percentage of flowers infected by the blackleg pathogen were scored by a visual inspection.

Main Stem and Branch Infection

The percentage of main stem and branch infections were recorded separately using a 0-4 scale. This scoring system only recorded the incidence and severity of the infections, it did not attempt to differentiate between different symptoms.

Table 2. Infection scale used to record incidence and severity of infection.

0 = none	No infection
0.5 = very low level	Can find at least a single infection within the plot
1 = <10%	Can find a few infections within the plot
2 = 11-30%	The infection is common but probably not causing yield loss
3 = 31-50%	The infection is likely to be causing significant yield loss
4 = >50%	infection is causing significant yield loss

Missing pods

The percentage of missing pods (resulting from flower infection) was recorded. Peduncles were inspected to ensure missing pods were due to blackleg infection. The whole plant was observed to determine a percentage of peduncles with a pod compared to peduncles with blackleg symptoms and no pod.

Pod lesions

The percentage of pods with a lesion was determined using 2 different methods. Method 1. Lesion % was determined by counting 200 pods and recording the number of pods that had a lesion. Method 2. Visual inspection of the plot was used to characterise the plot on a 0-4 scale (0= no infection, 1=1-25%, 2= 26-50, 3=51-75, 4=76-100).

Number of heads infected

The number of flowering heads infected or missing were counted for each plant scored.

Internal infection of the crown *Internal infection (stem canker severity)*

To determine the severity of internal infection of blackleg in surviving plants, 20 plants from each plot were assessed individually for each rep (80 plants in total for each treatment). All plants were scored in the pot experiment. Each plant was severed at the crown of the plant with a pair of secateurs and then visually assessed for the percent of the cross section of the stem with *L. maculans* symptoms (internal infection). Each plant was individually scored as having either 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100 % internal infection.

Plots were harvested to measure grain yield and grain quality was determined.

Results and Discussion

Results of all four trials are to be analysed together and are not available at present. However, several trials were also conducted in Victoria by Marcroft Grains Pathology and these included variable rates and timings of foliar fungicide application in conjunction with a range of sowing dates. The general results of these trials were that pod infection with blackleg was worse when canola flowered earlier than the optimal time for that area, thus the worst infection was from the very early sown crops.



Figure 1: Stem and flowers infected by blackleg at Bool Lagoon. 2016 (photo Trent Potter)

This blackleg infection resulted in aborted flowers, canker being noted on the upper stems of the canola plants rather than just at the crown and blackleg lesions on pods. Pods with blackleg lesions may shatter. The seeds that develop under these lesions are often shrivelled and are blown out of the back of the harvester, thus reducing grain yield. Blackleg infection of grain to be exported may have significant trade implications.



Figure 2: Blackleg lesions on canola pods at Bool Lagoon 2016. (photo Trent Potter)

Conclusions

Pod infection was not influenced by fungicide applications up to 30% bloom, but flowering date was very significant. Fungicide was effective at reducing Upper Canopy Infection. Fungicide was effective at significantly increasing yield, however the most effective timing for fungicide application was variable for each of the disease symptoms. The sclerotina spray application timing (30% bloom) appeared to be a good timing for Upper Canopy Infection control. However this work needs to be repeated in seasons that are conducive for severe Upper Canopy Infection symptoms.



Appendix

Appendix 1: Growth stages of Canola



10% flowering, at least 10 open flowers on the main stem.



30% flowering, at least 20 flowers on the main stem and only a few pods formed.



40% flowering, pods are forming but only a few elongating.



50% flowering, a few unopened buds at the top of the main stem and lower pods are elongating.