Fungicide options and optimal spray timings for effectively managing Sclerotinia stem rot in canola

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Key messages

- Sclerotinia levels were generally low in the northern agricultural region and moderate in southern agricultural regions in the 2015 cropping season. Crops that experienced high disease pressure had disease incidence above 40%.
- Trials conducted in the southern region indicated that the fungicide sprays were most effective when targeted at 25 to 50% bloom for managing Sclerotinia. Late spray applications were not economical for the control of Sclerotinia.
- The results for some non-registered products with alternative chemistries for managing Sclerotinia are promising

Aims

To evaluate optimum timing of fungicide spray applications and alternative products with new chemistry for effective and profitable management of Sclerotinia stem rot in canola particularly in the southern agricultural regions of WA..

Method

Two field trials were conducted to investigate the most optimal timing (s) for fungicide spray applications and the effectiveness of products for managing Sclerotinia in the southern agricultural region of WA. Three different fungicides viz. prothioconazole (210g/L) + tebuconazole (210g/L) (Prosaro®) @450mL/ha, procymidone (500g/L) (Sumisclex®) @ 1L/ha and bixafen (75g/L) + prothioconazole (150g/L) (Aviator) @ 600mL/ha were applied at various bloom stages as shown in Fig. 1. Six fungicide products (4Farmers product X @1.22L/ha, Product A @ 1L/ha, Product B @ 1.5L/ha, Aviator @ 600mL/ha, Prosaro® @ 450mL/ha, and Sumisclex® @1L/ha) were evaluated for their efficacy to manage Sclerotinia stem rot in a separate trial. All fungicides were applied at 50% bloom. Variety GT50 was sown in both the trials.

A field trial was also conducted in the Northern agricultural region to evaluate the effect of various agronomic factors on the incidence of Sclerotinia. The trial was sown with two different varieties (Hyola 404 and Cobra), two row spacing (44 and 22 cm) and two plant densities (30 and 15 plants/m^2). Fungicide Prosaro® was applied at 30% bloom at the recommended rate.

In each trial, disease incidence (DI) was recorded for all treatments and all plots were harvested for yield. Seed samples from all treatments were analysed for quality using NIR.

Results

Effect of spray timings in effectively managing Sclerotinia

Conditions were conducive for the early release of spores and disease development, consequently sufficient stem rot developed in the trial. The results indicated that the plants sprayed with three fungicides (i.e. Aviator, Prosaro® and Sumisclex®) had significantly lower DIs than that the nil. There was no difference in DIs among three fungicide treatments. The DIs in all the groups with different spray timing were significantly lower than the nil. The DIs of plants with spray timing at 25%+60%, 25% and 50% bloom were significantly lower than those with spray timing at 3 weeks after 60% bloom and 3 weeks after 60% bloom (Fig. 1).

There were significant yield responses to some fungicide treatments. The results indicated that the yields of plants with the utilisations of fungicides Aviator and Prosaro were significantly greater (27 and 31% respectively) than that in the nil (data not shown). The yields of plants with spray timing at 25%+60%, 25% and 50% bloom were significantly greater than that in the nil treatment. The yields of plants with spray timing at 60% bloom and 3 weeks after 60% bloom were not significantly different to nil (Fig. 1). The net return for various treatments ranged between -$21 (3 weeks after 60% bloom) to $178 (50% bloom).

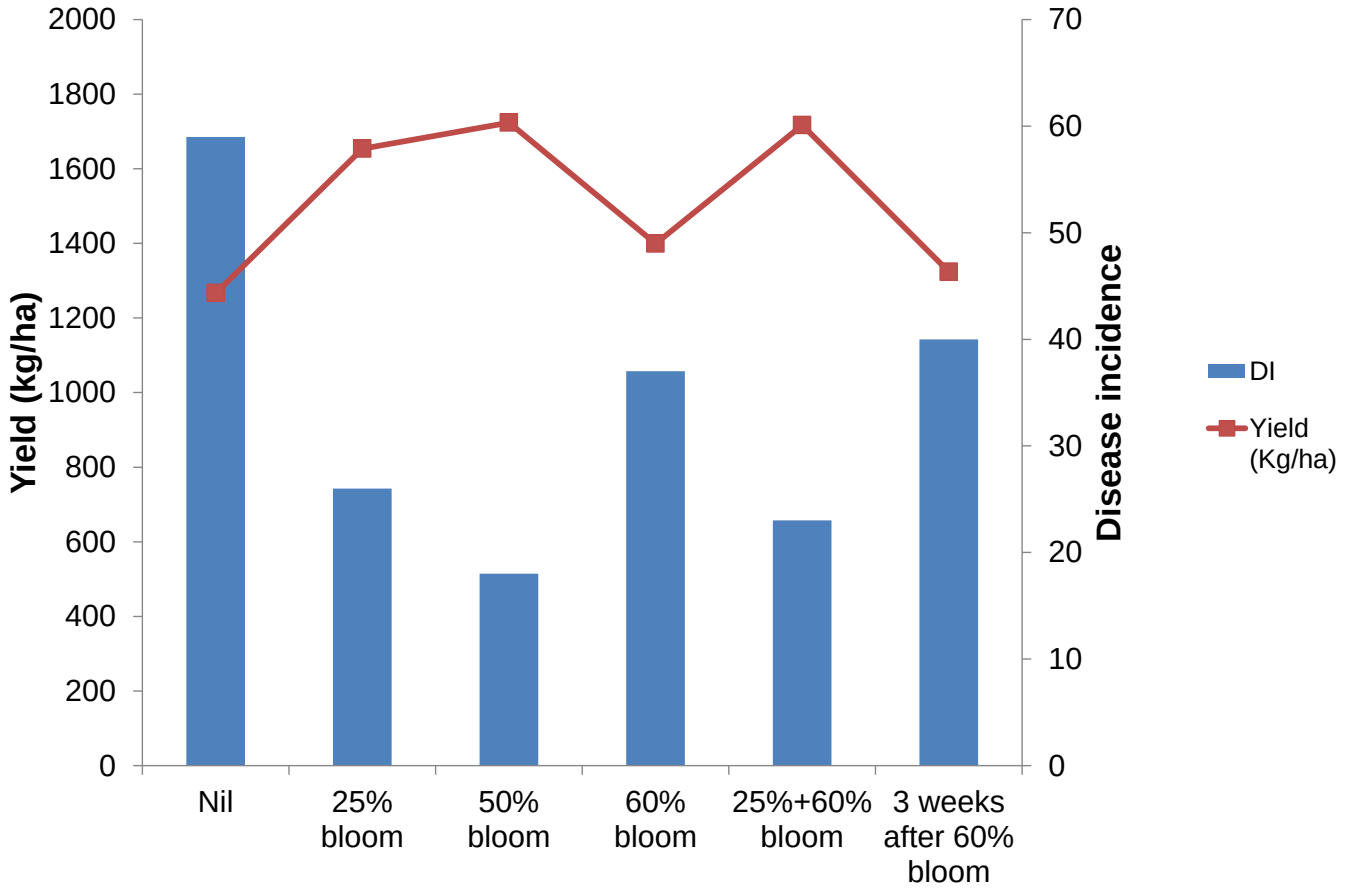

Fig. 1. Main effect of fungicide timing on disease incidence (per cent plants infected) of Sclerotinia and yield of canola. Lsd for disease incidence = 10 and for yield = 199.

Efficacy of fungicide products in managing Sclerotinia

The analysis of disease incidence (DI) indicated that the plants sprayed with each of the six fungicide products (4Farmers product X, Product A, Product B, Aviator, Prosaro® and Sumisclex®) had significantly lower DIs than that in the nil (no spray). The DIs of plants sprayed with Product B were significantly higher compared to those with the use of the other five fungicide products (data not shown).

The yield was significantly greater in plots treated with each of the 6 fungicides (4Farmers product X, Product A, Product B, Aviator, Prosaro®, and Sumisclex®) than the nil. The yield of plants with the use of fungicide Product A, Aviator and Prosaro® were significantly greater than that with the use of Product B (data not shown).

Effect of row spacing on Sclerotinia incidence, yield and quality of canola

As a result of non-conducive conditions, disease epidemics failed to eventuate in the trial, therefore, row spacing and plant density did not result in any impact on disease. However, it was interesting to record the effect of some agronomical factors on yield. The yield was significantly higher in Hyola 404 (1045 kg/ha) than in Cobra (821 kg/ha), likewise, plots with higher plant densities yielded significantly higher (1004 kg/ha) than with lower plant densities (861 kg/ha), whereas, row spacing didn't have any effect on yield. Mean oil content was content significantly higher in Hyola 404 (45.8%) than in Cobra (43.7%) and mean Protein content was significantly higher in Cobra (22.3%) and narrow row spacing (22.2%).

Conclusion

This is the first time that fungicide timing data for canola is available from trials conducted in the southern cropping region of WA. In 2015, conditions were favourable for early spore release in the southern region, therefore, fungicide applications applied at 25 or 50% bloom were most effective in reducing disease levels and improving yield of canola. Two spray applications were equally as effective but the single spray application targeted at the right bloom stage was more economical and provided $178/ha in net returns. Late spray applications applied at 60% bloom or 3 weeks after were uneconomical. The results for some non-registered fungicide products with alternative chemistries for managing Sclerotinia are promising. Effect of some agronomic practices on Sclerotinia management was not realised due to lack

of sufficient disease in the trials, however, in a year with less favourable growing conditions higher plant densities produced significantly higher yield.

Key words

Sclerotinia stem rot, canola, disease management, fungicides, row spacing, plant density

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