

Fungicides for crown rot management

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Key Findings:

- To date field trials funded by GRDC project DAS00136 have not been able to show that application of fungicides to seed provide significant reductions in yield loss caused by crown rot.
- Fungicides applied to seed or in-furrow at seeding can provide some suppression of pathogen growth through the plant early in the season (as measured using DNA techniques) but this effect is gone by early grain fill.
- In crop spray applications targeted at the base of plants have shown small yield benefits, but these benefits are not consistent between sites and across seasons.

Why do the trial?

As part of a series of South Australian trials to determine whether new or commercially available fungicides, combined with novel or standard application methods, can provide significant control of crown rot caused by the fungal pathogens *Fusarium pseudograminearum* and *F. culmorum*.

How was it done?

This trial is one of five undertaken to compare chemistries and application methods at Hart, Roseworthy, Pinery and Hamley Bridge over the period 2012-2014. This trial also builds on findings from four trials (2008-2011) assessing seed treatment efficacy for crown rot control at Cambrai, Roseworthy and Hart.

The 2014 Hart Field Site trial was direct drilled in plots of 6 rows x 14 m. Plots were split, with 3 rows of each plot treated and 3 rows untreated. Four seed treatments (including Rancona[®] Dimension @ 320 mL/100 kg seed), three in furrow at seeding treatments (including combinations with in crop sprays) and one in crop spray treatment were compared.

The incidence of plants with crown rot was determined at early tillering and early grain-fill and crown rot severity was assessed at early grain-fill all based on visual assessment of browning at the base of tillers which is characteristic of crown rot infection. Expression of white heads during grain filling and final grain yield were also recorded. Plant samples (yet to be assessed) were collected at early tillering and early grain-fill to determine concentrations of *Fusarium pseudograminearum* and *F. culmorum* DNA in plant tissues.

Results

Plant establishment was good in all plots and weeds and other diseases were not an issue.

Rainfall early in the season was well above average and despite low rainfall during grain-fill, yields from the trial averaged 4.7 t/ha).

The incidence of crown rot infection was reasonable with 30%-50% of plants showing visual symptoms of basal browning. However, disease severity was low, with basal stem browning scores ranging from 0.36-1.28, as was white head incidence (average 9%, range 0% to 24%). There were no significant differences between fungicide treatments and the untreated control in their effects on disease incidence, severity, white head expression or yield.

Discussion

The expression of crown rot symptoms (severity of basal browning and whiteheads) were limited at Hart in 2014. However, when considered in combination with results from other trials within the series, it is possible to make a number of statements about fungicide efficacy for crown rot control as outlined in the Key Findings section above.

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Photos from around Hart