

Foliar fungal disease in cereals, Hillston

Barry Haskins, District Agronomist, Hillston

In summary, and unexpectedly, there was no response to fungicides in any variety of wheat or barley in this trial. This was probably because of inconsistent responses between reps, a cool spring finish, late disease infection and ample soil moisture reserves.

2007

The trial

The aim was to observe and measure the impact of fungal diseases (in particular stripe rust in wheat and powdery mildew in barley) on yield and grain quality of 12 wheat varieties and 2 barley varieties, each with varying disease resistance levels.

Site details

Location: 'Wilga Glen', Hillston (irrigated).

Soil type: brown clay loam.

Rainfall: average annual 370 mm, growing season Apr-Oct 220 mm.

Management: this trial site was an irrigated field following corn in summer 2005/2006. The corn stubble was baled, disced and harrowed prior to sowing. The paddock had 150 kg urea pre-drilled, and was sown on 26 May (100 kg/ha seed plus 120 kg/ha Granulock 15). A further 60 kg/ha N was water run on the first irrigation (19 August), 20 kg N/ha water run on the second irrigation (20th September), and a third irrigation on the 11 October (no fertiliser).

Weeds were controlled with 0.8 L/ha MCPA LVE applied in June.

The trial was harvested on 29th November.

Treatments

The varieties were recently released varieties, along with a few familiar varieties used as checks.

Each variety was placed in a nil fungicide protection treatment (no seed dressing nor foliar fungicide) and a complete fungicide protection treatment (two well timed foliar fungicides).

The control treatment aimed at measuring the varietal resistance and how varieties performed under seasonal fungal disease pressure, whilst the fungicide treatment was aimed at measuring the genetic potential of each variety in the absence of fungal disease.

The fungicide treatments involved application of Opus® (500 ml/ha) on two separate occasions (5 September and 3 October) using an electric hand-held 2 m boom, delivering a water rate of 80 L/ha via four XR11002 nozzles.

Wheat varieties: EGA_Bellaroi, Carinya, Drysdale, Ellison, H46, Janz, Lang, Ruby, Sapphire, Ventura, Wentworth, Young.

Barley varieties: Hindmarsh, Schooner.

Seasonal review

A good early start to the season allowed timely sowing. Unfortunately by August conditions were extremely dry, limiting the number of opportunities (periods of leaf wetness) for fungal disease infection. Only 96 mm fell between April and October. The trial was grown mainly on irrigation water, and had a large canopy which would have favoured disease development.

Temperatures were quite cool in winter, which typically slows fungal disease development. Temperatures through September and October were cooler than average and were more favourable for fungal disease development than normal—warm weather reduces fungal disease spread.

Stripe rust was first observed 5 September, on one leaf in one plot, and was certainly not vigorous and a little later than expected on irrigation. Spread was slow until about 10 October when the



disease became very aggressive on susceptible varieties. Disease incidence was at a level adequate where treatment differences were expected.

Powdery mildew in barley developed in a similar manner and time frame. The lateness of the disease pressure reduced the impact on grain yield, the grain filling process over by the time the disease became established.

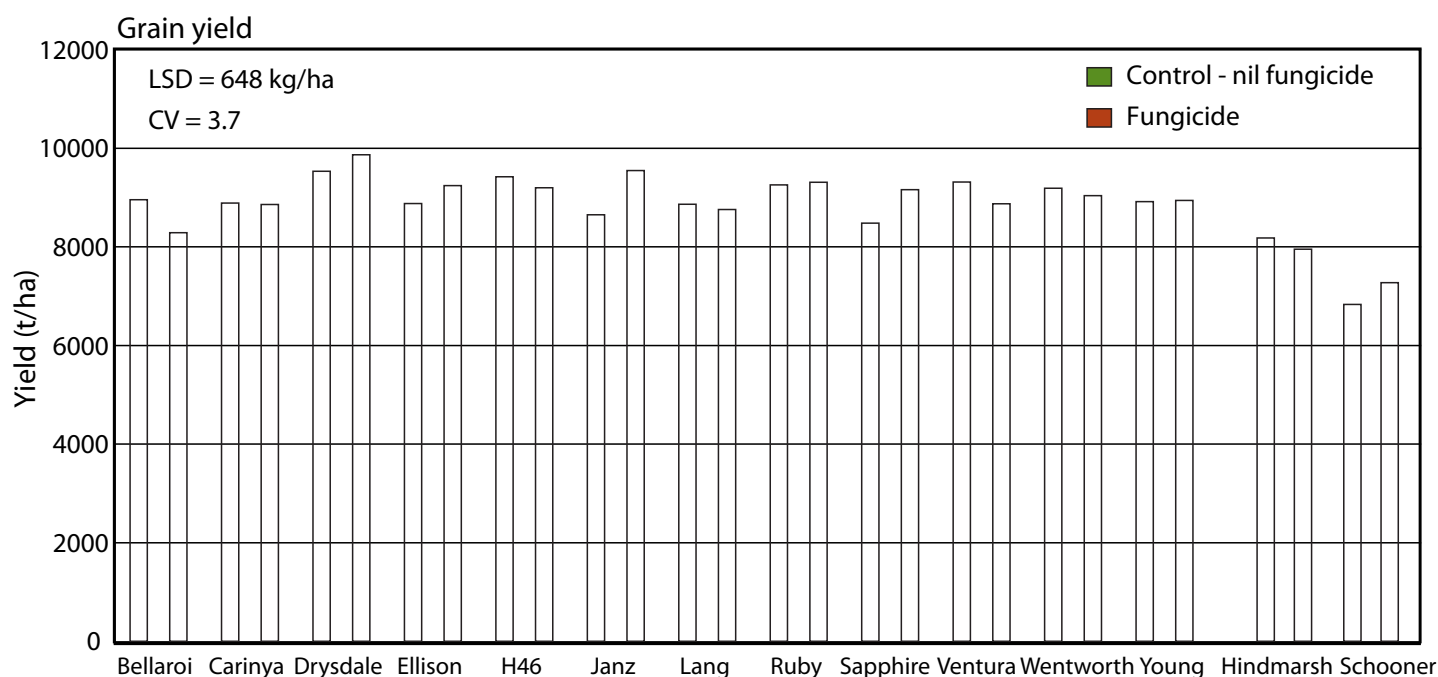
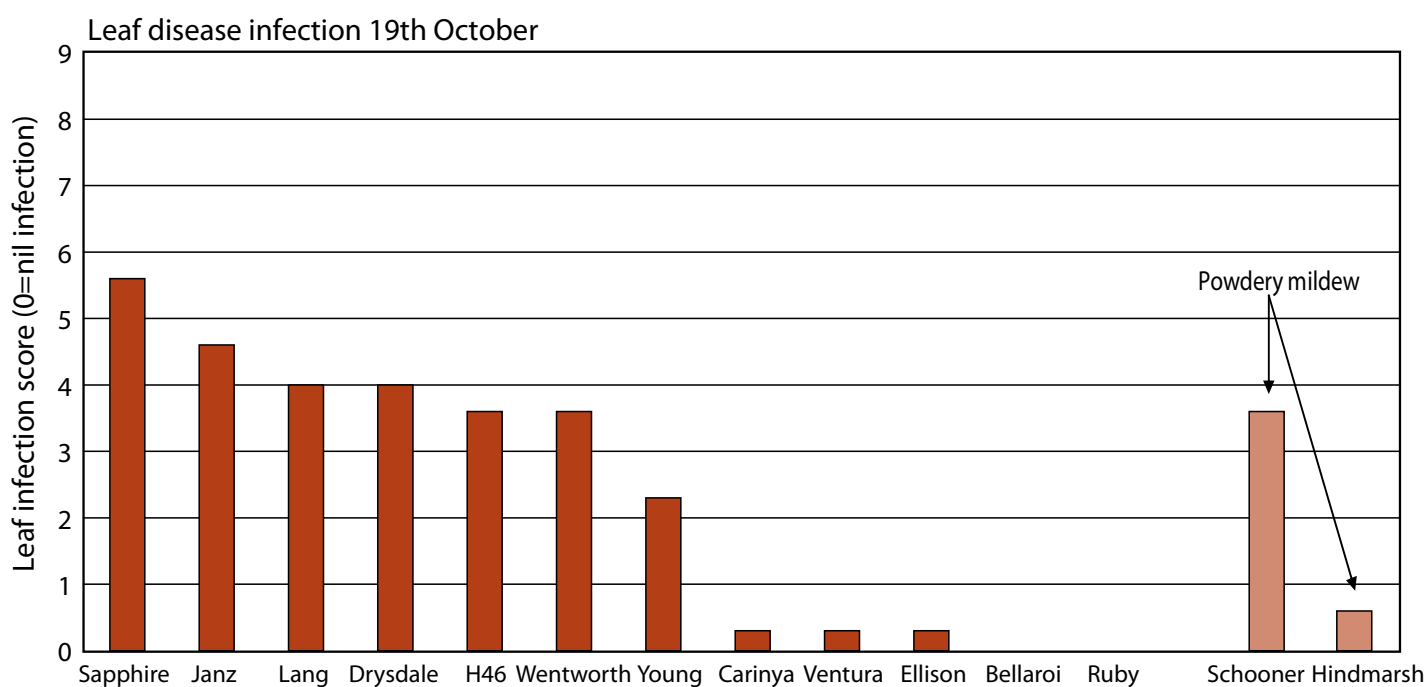
Results

All fungicide treated plots had 100% fungal disease control throughout the season, whilst control treatment disease scores are illustrated below.

Wheat

Statistically there was no yield response to applying foliar fungicide in any variety. This was due to a variability in between reps, where some showed a good response to fungicides, and others showed none. This can partially be explained by spatial variability of the disease within the trial, however disease scores suggested that the disease was quite evenly distributed within the trial and within the reps.

In addition, by the time the disease became aggressive the faster maturing susceptible varieties (H46, Drysdale, Wentworth and Young) were mostly through the critical growth stages where rust has a major impact on yield.





Stripe rust infection on Janz at flowering (1st week October)

Photo Barry Haskins.

This doesn't explain however why slower maturing varieties such as Janz, Lang and Sapphire showed no statistically significant response to the fungicides, whilst still hosting quite a large amount of rust on the untreated controls (as shown in the disease scores on page 2). Conditions in this trial allowed the wheat to produce grain with rust not being the limiting factor.

Barley

Statistically there was no yield effect by applying fungicides to the barley varieties.

Visually, it was very clear that Hindmarsh was much more resistant to powdery mildew than Schooner.

As for the wheat, by the time the powdery mildew became established, these fast maturing varieties had completed most of the grain filling process, minimizing potential yield loss.



Stripe rust infection on Sapphire at flowering (1st week October).

Photo Barry Haskins.

Interpretation of results

Much greater response to fungicides would normally be expected if the diseases had become established earlier in the season, and/or if spring temperatures had been hotter than observed. Obviously the late onset of disease, cooler than average grain fill conditions, and ample soil water reserves minimised the impact that fungal diseases had on all varieties.

Author: Barry Haskins, District Agronomist Hillston.

Further information: available from the project team agronomists at NSW DPI Wagga Wagga, Condobolin, Parkes, Hillston, Temora, Cowra and Moulamein.



NSW DEPARTMENT OF
PRIMARY INDUSTRIES



This publication is produced as part of GRDC project DAN00098 'Development of agronomy packages for new varieties for southern NSW (VSAP)'.

**Variety Specific
AGRONOMY
Packages**

© State of New South Wales through NSW Department of Primary Industries 2008

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (March 2008). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.