WHEAT IN THE BIRDCAGE



lssue 4 March 1, 2022

Welcome to the fourth and final issue of Wheat in the Birdcage where I'll share final observations and yields from the birdcage trial at Waite.

A quick re-cap

The trial was conducted to assess genetic resistance ratings of current wheat varieties to septoria tritici blotch (STB), and how different infection timings throughout the growing season affect yield loss across these varieties.

In my last update (Wheat in the Birdcage | Issue 3 | Nov 2, 2021) we took a close look at disease assessments at early grain fill.





Trial update

Harvest was delayed as Illabo, a slower maturing variety, developed significantly later than other varieties.

Unfortunately, the trial site experienced severe wind conditions and heavy rains pre-harvest, with most plots suffering lodging. Triticale surrounded the trial as a buffer area and became completely lodged (Figure 1).

Despite this, the trial was harvested successfully on December 3.





Figure 1. The STB trial in the birdcage at Waite. Photo taken November 12, 2021.

To calculate grain yield, 2 rows x 1 m were taken from each plot. This was done by using a one metre piece of wood for measurement and a scythe to cut the stems (Figure 2).



Figure 2. Harvesting grain samples at Waite.



How was grain yield calculated?

Once the cuts were completed, all heads were removed from the stems (Figure 3) and put through a wintersteiger thresher in the Plant Research Centre at Waite. The samples were cleaned using a dockage tester. Each grain sample was then weighed and grain yield was calculated.



Figure 3. (L-R) Wheat heads prior to threshing, the threshed sample and cleaned grain (after the dockage tester).

Yield loss from septoria infection

We know that when the upper leaves of a plant are not affected by disease, significant yield losses may not occur. This is because the major leaves, like the flag leaf, are a significant contributor to the yield potential of wheat (Poole 2005).

In this trial, low disease pressure in spring reduced the ability of STB to infect the main leaves of plants across all varieties.

As a result, no significant yield loss was observed between all infection timings of STB in wheat (Figure 4).



Figure 4. Summary of grain yields (t/ha) of each infection timing treatment at Waite.



Grain yield for all varieties was similar and varied between 4.33 and 5.16 t/ha.

This is in contrast to the leaf infection data, where the most susceptible varieties had higher levels of disease, compared to the most resistant varieties. Disease levels still remained low across the trial and no yield differences between were observed between trialed varieties in 2021 (Figure 5).



Figure 5. Summary of grain yields for each wheat variety at Waite.

Septoria tritici blotch requires wet conditions to spread; however, a dry finish across August and September reduced the spread of disease across leaves in the upper canopy, providing negligible impact on crop grain yield at Waite in 2021.

This trial will be conducted again in 2022 to assess results under different seasonal conditions.

My experience in 2021

During this project, I really enjoyed learning about STB and better understanding how to design disease trials in the field and lab.

I also enjoyed learning more about other wheat and barley diseases through various trials conducted by the SARDI cereal pathology group.

Working in the lab at Waite was great to understand how the disease trials start; by selecting the source of disease and replicating it, to have adequate amounts to inoculate trials. It also demonstrated how different diseases need different environmental conditions to develop and survive.





During the trial, I was surprised at how quickly septoria could spread. I observed this through the treatment blocks already having disease before they were inoculated. This was something I was not familiar with growing up in the Mallee.

I really enjoyed working with the SARDI cereal pathology group at Waite. Tara Garrard and her team were always helpful and willing to share their knowledge and experiences with me which helped improve my trial management skills and decision-making while conducting assessments.

A full report of our findings will be available in the <u>2021 Hart Trial Results</u> book, available online (free) from the Hart website from March 9.



References

Poole N 2005, 'Cereal Growth Stages', Grains Research & Development Corporation

