

Hyper Yielding Crops – Benchmarking and Awards

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KEY MESSAGES:

- In 2022, the Hyper Yielding Crops (HYC) project awards paddocks were made up of 7 cultivars of wheat and 3 of barley, highlighting the diversity of high performing wheat options.
- Winter wheat cultivars out-yielded the spring wheat cultivars by an average of 1.5 t/ha.
- Wheat (6.14 t/ha) outyielded barley (5.99 t/ha), however, there was less variability in barley yields across the benchmarked paddocks.

Background

The FAR hyper yielding crops awards project is currently in its third season, and growers are building on the results of the 2020 and 2021 seasons to continue to push yields and productivity within the HRZ of WA. The HYC awards and Focus paddock trials are developed in tandem with the HYC innovation centres. This project allows growers to utilise environmentally specific agronomic management practices developed within the innovation centres, as well as peer-to-peer learning opportunities provided by the innovation group meetings, to further improve broadscale yield performance through benchmarking regionally relevant data. This in turn informs the research conducted at the HYC innovation sites. As the diagram below demonstrates, the four elements of the project work in tandem to build a more productive and adaptive farming system within the WA HRZ (Figure 1).

Methodology

There were 12 barley paddocks and 13 wheat paddocks entered in the awards program for the Albany Port Zone in 2022. They represented a large swathe of the lower great southern, ranging from Gnowellen in the east to Frankland River in the west and Scotts Brook in the North.

Of the barley awards paddocks, all but two were Planet, with the other two being planted to Maximus and Laperouse.

There was a greater varietal variation in the wheat paddocks with both winter and springs wheat grown. Some farmers had entered a wheat paddock in the awards for three seasons in a row, allowing us to gather data on how wheat farming systems adjust season-to-season.

All input and yield and grain quality data was collected from each of the paddocks.



Figure 1. Flow chart describing how each component of the Hyper Yielding Crops project work together to provide better information to growers on improving yield in high rainfall regions.

Results and Discussion

Barley

The barley yields for the top 25% of benchmarked paddocks averaged close to 8t/ha whereas the remaining 75% yielded an average of 5.5t/ha (Figure 2). All the Planet barley paddocks in east and west sub-groups suffered from severe net-type net blotch, which likely impacted the yield performance of these crops. The barley paddocks in the more northern regions were not impacted to the same extent. In cases of severe infection, yield penalties were often compounded by lodging and brackling. This is a result of the disease pressure leading to early grain fill, which, when coupled with the delayed harvest due to the wet finish, resulted in loss of turgor pressure and ultimately, the crops fell over.

Despite the management issues that plagued the 2022 barley crops, the yield average of 5.99 t/ha shows the production that can be achieved in favourable conditions. However, the critical grain set period for the vast majority of the benchmarked barley paddocks occurred in early September, which was not optimal for yield production given that it was still quite wet, and the solar radiation was limited. This highlights the potential to seed barley later in the season, in the lower Great Southern environment to maximise available solar radiation during critical grain set period.

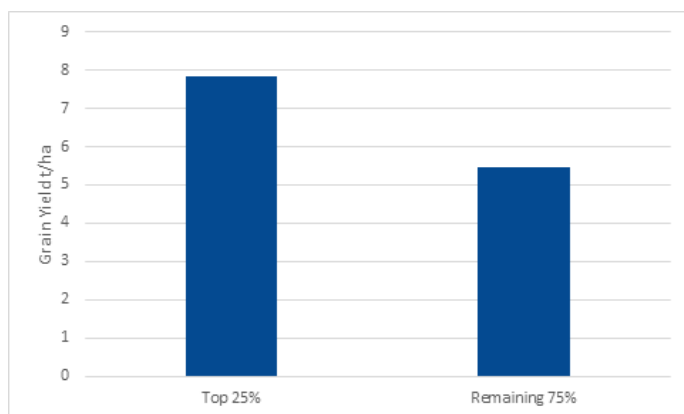


Figure 2. Barley yield comparison between the top 25% of benchmarked awards paddocks and the remaining 75% for 2022.

Wheat

The 2022 wheat yields for the HYC group outperformed the previous two seasons, with a district average of 6.14 t/ha. The seasonal conditions were ideal for producing high yielding wheat, as water was never a limiting factor to crop production. Additionally, the critical grain fill period (2 weeks prior to flowering) which occurred between the last week of September and the third week of October for

most of the award paddocks, was cool with above average solar radiation, which is ideal for grain set.

In 2022, the top 25% of paddocks yielded 7.49t/ha, while the remaining 75% yielded 5.69t/ha (Figure 3). Interestingly, of the observed paddocks, the winter wheats outyielded the spring wheats (Figure 4), despite only making up 30% of the wheat pool. This differential in yield between the wheat types is due to the soft finish coupled with the ample September and October rainfall. These conditions allowed the long season winter wheats to accumulate biomass late into the season, without risk of heat or drought stress in the late spring.

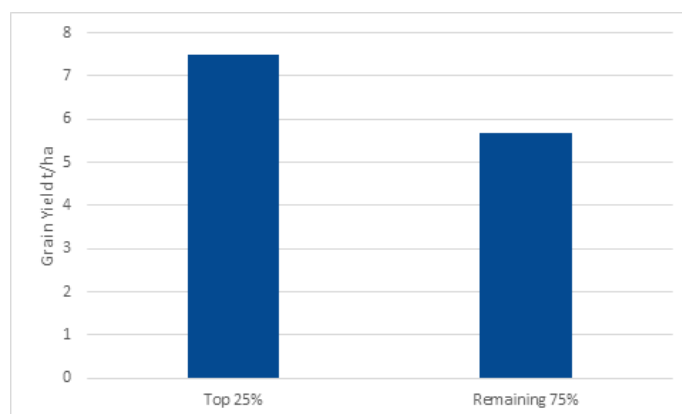


Figure 3. Wheat yield comparison between the top 25% of benchmarked awards paddocks and the remaining 75% for 2022.

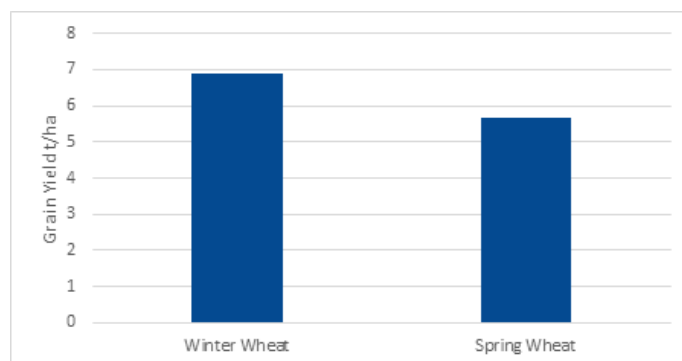


Figure 4. Yield comparison of winter versus spring wheat varieties for 2022 awards paddocks.

Conclusion

The HYC awards and benchmarking program will continue in 2023. While the yields are not guaranteed to show the continued year-on-year improvement that we have seen to date, the ability to benchmark crop production and management is critical to improving productivity in grain production in the high rainfall zone of WA.

Acknowledgments

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