

Yield Prophet® performance in 2018

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Key findings

- Yield Prophet® closely predicted wheat grain yield for Mace towards the end of the season.
- Lack of rainfall during the season meant the difference between 20% and 80% of years was 1.0 t/ha in mid-September and had decreased to only 0.3 t/ha in early October.

Why do the trial?

Wheat growth models such as APSIM are highly valuable in their ability to predict wheat yield.

Yield Prophet® is an internet based service using the APSIM wheat prediction model. The model relies on accurate soil character information such as plant available water and soil nitrogen levels, as well as historical climate data and up to date local weather information to predict plant growth rates and final hay or grain yields.

This early prediction of grain yield potential means it can be used to directly influence crop input decisions. No other tool is currently available to growers, which can provide information of this accuracy at such a useful time of the season.

How was it done?

Seeding date	1 st May 2018	Fertiliser	30 kg N/ha 1 st May 20 kg N/ha 18 th July
Variety	Mace wheat @ 180 plants per square metre		

Yield Prophet® simulations were run throughout the season to track the progress of wheat growth stages and changes in grain yield predictions.

20%, 50% and 80% levels of probability refer to the percentage of years where the corresponding yield estimate would have been met, according to the previous 100 years of rainfall data.

Results

At the first simulation on 27th June, Yield Prophet® predicted that Mace wheat sown on the 1st May would yield 3.7 t/ha in 50% of years (Figure 1). After well below average rainfall in June and July (Table 1), it is not surprising that this yield prediction reduced to 2.7 t/ha from mid-June until late August.

The Yield Prophet® simulation in mid-September decreased further to 2.2 t/ha. This was driven by below average rainfall for September (Table 1). By the start of October, the 20%, 50% and 80% of year's prediction were closely aligned between 1.8 – 2.1 t/ha. The actual grain yield for Mace sown in mid-May was 2.0 t/ha in the Hart wheat variety trial. Yield Prophet® closely predicted wheat grain yields in the Hart district as it has in previous seasons. Localised frost damage was observed in the district and would have contributed to lower grain yields. The effects of heat and frost stress were not modelled in the predictions presented here.

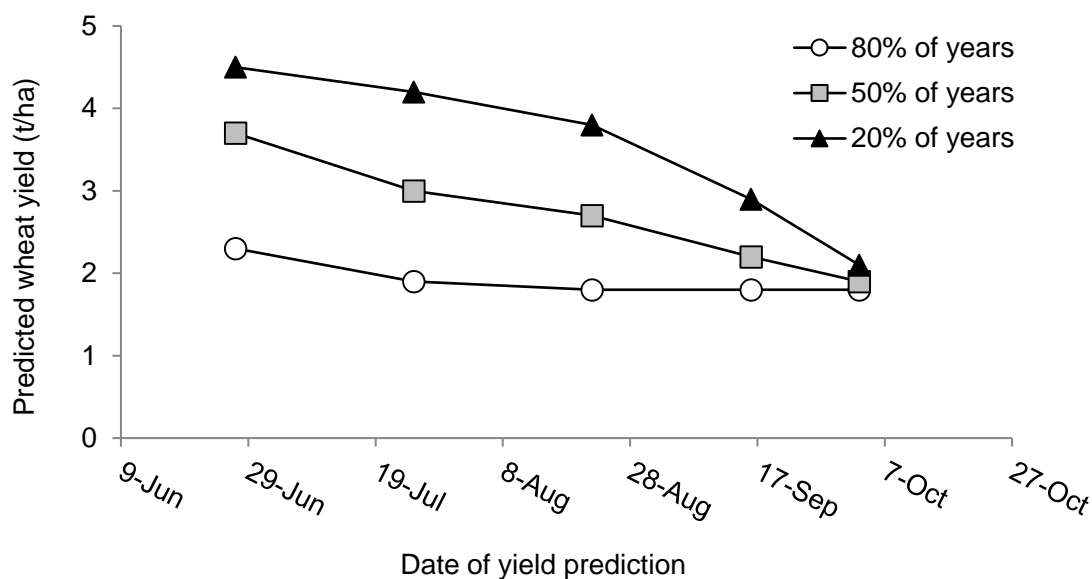


Figure 1. Yield Prophet® predictions from 27th June to the 3rd October for Mace wheat sown on the 1st May, 2018. 80%, 50% and 20% represent the chance of reaching the corresponding yield at the date of the simulation.

Table 1. Long-term (100-year average) and 2018 monthly rainfall (mm) for Hart.

	Long-term ave. (mm)	2018 (mm)	Difference (mm)
Jan	19	12	-7
Feb	21	3	-18
Mar	18	9	-8
Apr	27	13	-14
May	44	42	-2
Jun	50	25	-25
Jul	49	20	-30
Aug	48	43	-5
Sep	44	8	-36
Oct	37	9	-27
Nov	27	29	2
Dec	24	9	-14
Total	408	223	

Plant available water (PAW) (0-90 cm) at the beginning of June was low, at 48 mm (Figure 2). This was significantly less stored moisture compared to the same time in 2017 (169 mm). Across the entire growing season PAW did not exceed 50 mm (or 25% of the ‘bucket’ estimated to hold 200 mm PAW). Plant available water decreased during June and July due to below average rainfall. Rainfall in August kept the PAW level consistent in this month. The soil moisture probe at Hart showed barley roots extracting soil moisture to depths of 80 cm at the beginning of August. From early September the bucket water level decreased to almost empty at the start of October, reflecting the dry finish and signalling an early harvest.

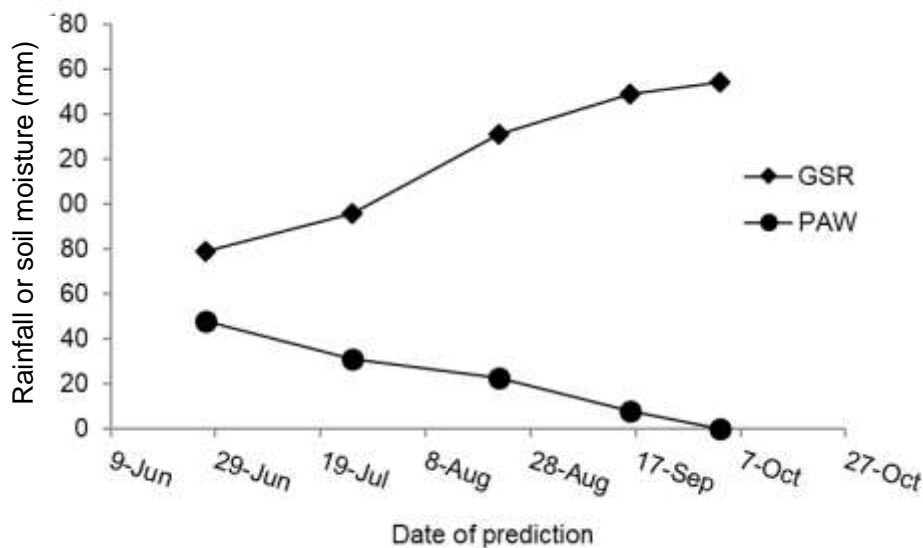


Figure 2. Predicted plant available water (PAW) and recorded cumulative growing season rainfall from 27th of June to 3rd of October at Hart in 2018.

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HART BEAT
Yield Prophet® simulations for 8 sites across the mid-north of SA
The Yield Prophet® simulations featured are not a crystal ball, but provide a realistic prediction of the available soil water and nitrogen status of your crop.

HART EVENTS
Hart Field Day – September 18, 2018
Spring Twilight Walk – October 16, 2018

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The *HART BEAT* newsletter, first introduced in 2009, is an initiative of the Hart Field-Site Group.

It is aimed at providing farmers and agronomists with regular updates of current and predicted crop and soil conditions as a season progresses.

We believe it will assist in making informed choices on the need for additional nitrogen and fungicide applications.

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