Yield Prophet® performance in 2009

Key findings

- The actual wheat grain yield at Hart in 2009 was 2.46 t/ha, well under the final Yield Prophet® prediction of 3.7 t/ha.

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.

How was it done?

Seeding date 18th May 2009 **Fertiliser** DAP @ 60 kg/ha + 2% Zn

Variety Gladius wheat @ 70 kg/ha

Soil samples were taken for soil nitrogen and moisture on the 2nd April 2009.

Table 1: Soil conditions at Hart (0-90cm), 2nd April 2009.

Available soil moisture	0mm
Initial soil N	94 kg/ha

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

The grain yield for Gladius wheat sown on the 18th May at Hart in 2009 was 2.46 t/ha. This final grain yield is well below the final Yield Prophet® prediction, however it fell between the 50% and 80% level of probability up until the 23rd of September 2009 (Figure 1).

On the date of the first simulation, 24th June 2009, the Yield Prophet® simulation predicted that Gladius wheat sown on the 18th May with 165 plants per square metre would yield 3.3 t/ha in 50% of years. The predicted yield increased slightly in July and then by the end of

August had dropped 0.7 t/ha to 2.6 t/ha at the 50% level of probability (Figure 1). Yield predictions continued to drop at a steady rate until significant rainfall events occurred in mid September. The final Yield Prophet® simulation on the 28th September for predicted yield at the 50% level was 3.7 t/ha.

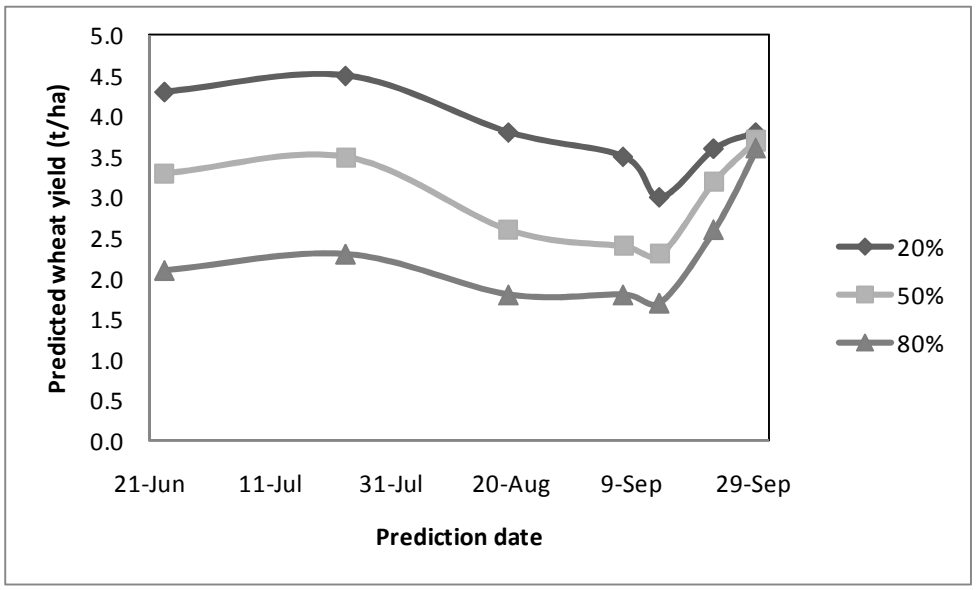

Figure 1: Yield Prophet® predictions from 24th June to the 28th September for Gladius wheat sown on the 18th May with 60 kg/ha DAP. 80%, 50% and 20% represent the chance of reaching the corresponding yield at the date of the simulation.

At sowing plant available water (PAW) measured 0mm (0-90cm). Figure 2 shows that by the 24th of June PAW had increased to 27mm and increased further to 47mm by the 24th July. However, as the season progressed PAW declined and significant water stress began to occur during August (Figure 3). Around the time of flowering, 12th to 16th September, the daily maximum temperature was above 25 ^{O}C, this also occurred in October. Rainfall from the 16th September relieved the stress and PAW increased to an estimated 52mm on the 28th September.

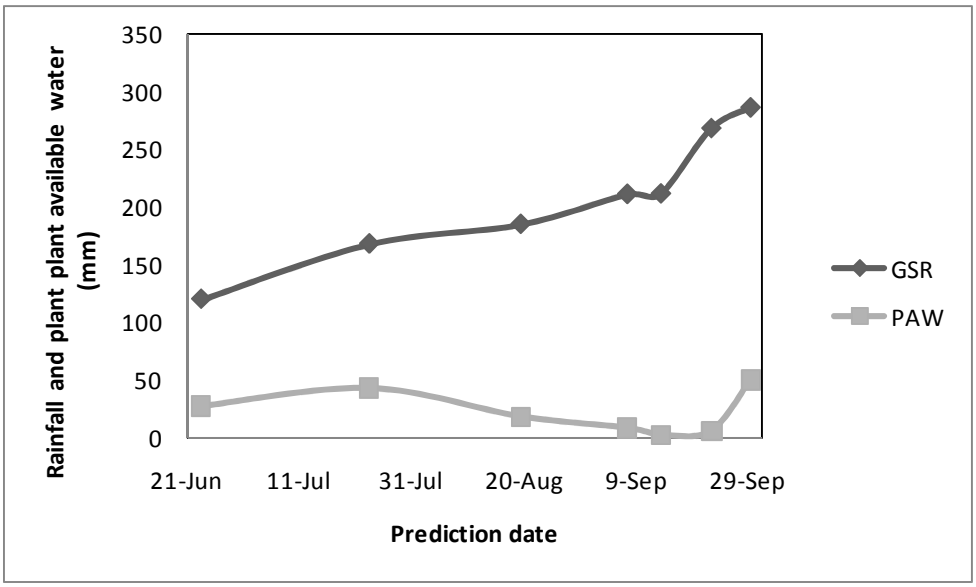

Figure 2: Predicted plant available water and cumulative growing season rainfall from 24th June to the 28th September at Hart in 2009.

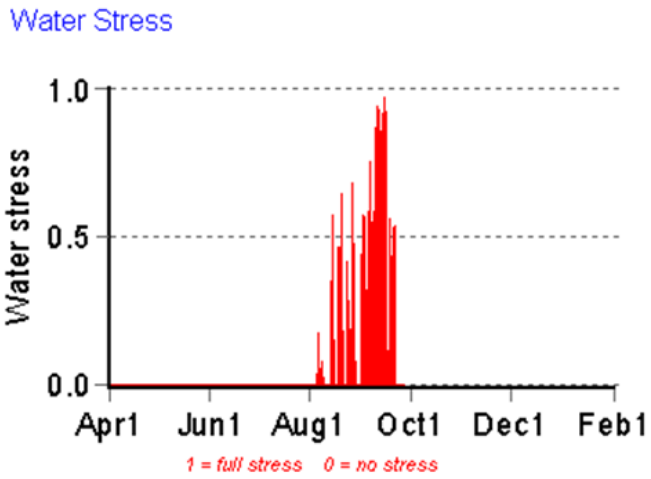

Figure 3: Predicted crop water stress for Gladius wheat sown on the 18th May at Hart in 2009.