Seasonal Update of the BCG Trial Sites Using Yield Prophet®

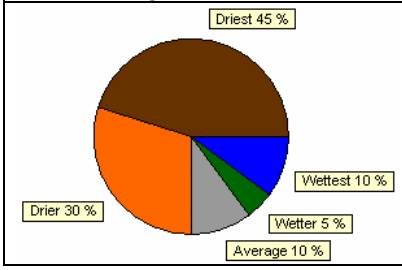
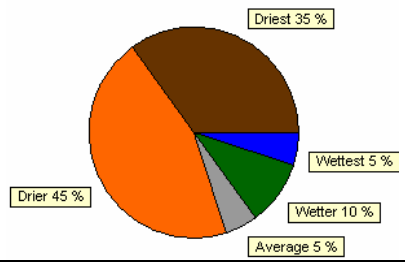
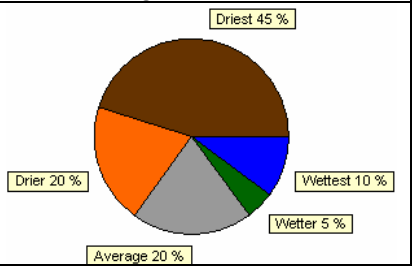
By James Hunt, BCG Yield Prophet Coordinator

August of this year was one of the driest on record for our region. At Birchip Reservoir, only 2mm was recorded for the whole month, which is the second lowest monthly total for August on record (in 1944 only 1mm was recorded!). This extended period of dry, in conjunction with no subsoil moisture in most paddocks prior to April, the patchy and incomplete break, high temperatures and winds have really put crops in our region behind the eight ball. The rain that fell throughout much of the region on 6 September (frustratingly some areas still missed out) has got a lot of crops out of immediate trouble. However, there are tough times ahead, with a high chance of getting below average rainfall for the remainder of this season.

Seasonal Forecast for the Region

All of the forecasting systems used by Yield Prophet are currently indicating a greatly increased chance of dry conditions for the remainder of the season (Figure 1). The SOI moved into a negative phase in August, which in Yield Prophet has resulted in yields simulated using the season finishes from years with a negative SOI phase in August being significantly different to yields simulated using season finishes from every year in the last hundred (Figure 2).

Figure 1. Probabilities of getting a driest (1 in 5 dry), drier, average, wetter or wettest (1 in 5 wet) season finish (next three months) at each BCG site given a negative SOI phase in August.

Hopetoun	Birchip	Rupanyup
75% chance of a drier than average season finish	80% chance of a drier than average season finish	65% chance of a drier than average season finish
		

The Bureau of Meteorology is indicating that there is between a 40 and 45% chance of western Victoria receiving in excess of median rainfall in August-October.

Yields for the three sites that would be achieved assuming season finishes from DAFWA's ESS analogue years (Table 1), with the exception of the Birchip site in a 1963 finish, are all in the lowest 50% of yield outcomes generated by Yield Prophet (Figure 2). This is despite two of the years having above average September-October rainfall at the three sites.

Table 1. Yield Prophet simulated yields at the three BCG sites assuming season finishes from the DAFWA ESS analogue years (released September 7 2006).

	Yield t/ha		
Analogue Year	Hopetoun	Birchip	Rupanyup
1994	0.9	0.3	1.4
1963	1.1	0.8	1.8
2002	1.0	0.3	1.4
1951	1.1	0.3	2.1

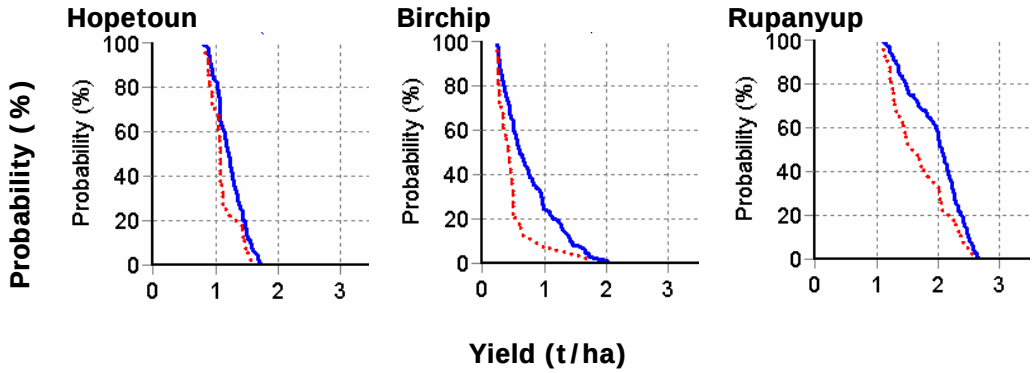


Figure 2. Yield probabilities at the three BCG sites assuming season finishes from the last 100 years (—), and only those years in which the SOI was in a negative phase in August (····).

Hopetoun

Yield Prophet indicates that at time of writing (7 September) the Wyalkatchem crop at Hopetoun is booting. The prolonged dry has meant that the nitrogen stress that the crop has been subjected to for the last couple of months has started playing second fiddle to water stress, which is the factor most likely to limit the yield of this crop. The seasonal forecasting tools integrated into Yield Prophet are indicating that a yield of around 1t/ha is the most likely outcome for this site (Figure 2).

Birchip

Despite its late stage of development, the Yitpi crop at Birchip became severely water stressed at the end of August. With only 21mm of water currently available to the crop (there was only 4mm available prior to the rain on 6 September), it will only take a week or two without rain for stress levels to creep up again. The extended dry and late sowing ultimately means that a yield of around 0.5t/ha is the most likely outcome for this crop (Figure 2). This does not take into account any yield lost to heat shock at flowering, and given that flowering is forecast to occur from the last week of October to the first week of November, this is a distinct possibility.

Rupanyup

The last update at the beginning of August stated that nitrogen top-dressing would almost certainly be required at Rupanyup for the crop there to achieve its potential. One month, little rain, and almost no top-dressing opportunities later, this is still true, but as the potential yield has been reduced, so too have the chances of nitrogen limiting the yield of this crop (Figure 3), and hence of getting a profitable response to fertiliser inputs (Figure 4). Assuming season finishes for the last 100 years, there is still a 75% chance of getting a yield

response to nitrogen application. However, this crop is currently at GS32 and rapidly moving beyond the recommended growth stage for N fertiliser application. Also, running Yield Prophet using season finishes from years with a negative SOI phase in August lowers the probability of getting a nitrogen response to 30%. Add to this the danger of haying the crop off, top-dressing is not an overly attractive proposition at this site, and yield is likely to be around 1.5-2.0t/ha.

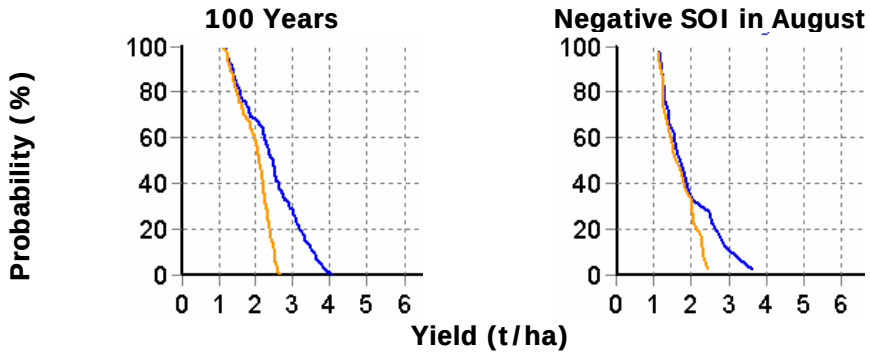


Figure 3. Yield probabilities at the Rupanyup site from applying no further nitrogen fertiliser (—) and 80 kg/ha of urea (—) at flag leaf emergence (10 September), assuming season finishes from the last 100 years, and only those years in which the SOI was in a negative phase in August.

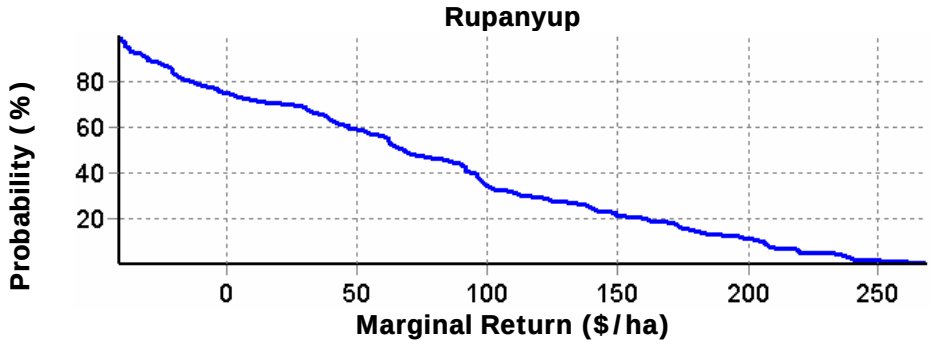


Figure 4. Marginal return at the Rupanyup site from applying 80kg/ha of urea at flag leaf emergence (10 September). Price of Yitpi wheat at harvest assumed to be $200/t, protein reward $4/% above 11%, the cost of urea $500/t and spreading $8/ha.