

3.3.2 Barley variety trial - Dunkeld, Vic

Location: SFS Dunkeld Research Site

Funding:

This was an SFS Hamilton Branch Funded Trial

Researcher(s):

Southern Farming Systems

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Acknowledgements:

Thanks to Doug McArthur for providing the land for this trial.

Summary of findings:

- The trial yielded an average of 6.1 t/ha for the 2011 season. A late time of sowing and a saturated soil profile that led to waterlogging effects may be partly to explain for the lower than expected yield based on Water Use Efficiency values.
- The highest yielding variety were the feed cultivars with Oxford topping performance at 6.96 t/ha.
- Spring rainfall (Sep-Nov) was considerably lower in 2011 at 135.2mm compared to the long term average for Dunkeld of 196.9mm. This shortfall will partly explain the reduction in yields across all varieties at this site compared to Inverleigh and Lake Bolac.

Background/Aim:

To evaluate a range of commercially available varieties. These reflect the most widely grown varieties in the area and include others that may be considered in the future. They include a number of different grades, reflecting market options in Southern Victoria.

Rainfall:

2011 Total:	724.1 mm
Avg. Annual:	696.4 mm
2011 G.S.R.:	432.5 mm
Avg. G.S.R.:	433.5 mm

Paddock History:

2009:	Canola
2010:	Wheat

Soil Characteristics:

Soil Type:	Brown clay loam
pH (1:5 CaCl):	5.1
Nitrate (mg/kg):	98
P (Colwell) (mg/kg):	54
K (Colwell) (mg/kg):	270
Organic Carbon %:	2.5

Yield Potential: The Water Limited Yield Potential (WLYP*) for this trial was 7.8 t/ha.

*WLYP: Calculated using WUE values of 15kg/ha per mm rainfall for Wheat/Barley and 7kg/ha per mm rainfall for Canola, 130mm assumed evaporation and GSR of 30% Jan & Feb + 50% Mar (only if >20mm) + April to November. This calculation makes an allowance for a % of stored moisture from the summer

Variety: Various

Sowing rate: Aiming to establish a target population of 190 plants/m²

Sowing date: 1-Jun-11

Harvest date: 13-Dec-11

Plot size: 10m x 1.45m x 4 reps.

Plot type: Beds

Fertiliser:	1-Jun-11	MAP 100kg/ha
	31-Aug-11	Urea 150kg/ha

Herbicide:	1-Jun-11	Boxer Gold 2.5L/ha, Roundup Powermax 1.5L/ha
	7-Sep-11	Precept 500ml/ha, Lontrel 150ml/ha, Axial 300ml/ha, Adigor 500ml/ha

Fungicide: 22-Sep-11 Prosaro 150ml/ha
Hasten 1%
4-Nov Prosaro 300ml/ha

Insecticide: 30-Jun-11 LeMat 120ml/ha

Measurements: Cultivar yield is the primary component to be measured in this trial; however protein and screenings have also been measured in line with commercial practices.

Diseases: Early on in the season some net form of net blotch (NFNB) was seen on susceptible barley varieties. There was also a little scold and rust, but the dry spring reduced the disease pressure and they didn't cause too much of a problem.

Tillage type: The majority of trials were sown with the SFS cone seeder on 20cm row spacing's using 2.5cm knife-points. Stubble burnt prior to sowing.

Results and discussion:

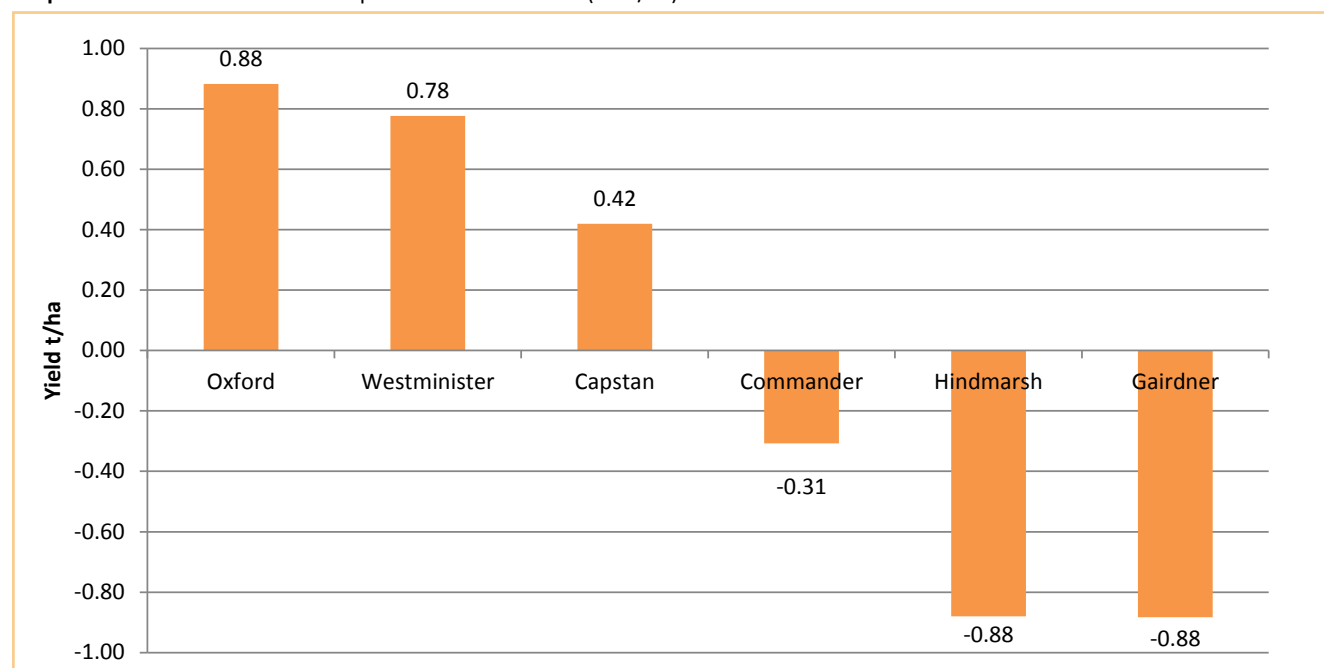
Spring rainfall (Sep-Nov) was considerably lower in 2011 at 135.2mm compared to the long term average for Dunkeld of 196.9mm. This shortfall will partly explain the reduction in yields across all varieties at this site compared to Inverleigh and Lake Bolac. Spring rainfall can be crucial for determining yield, coinciding with appropriate nitrogen application at stem elongation. This is when the majority of grain numbers in the head are set.

Table1. Yield and quality of barley varieties at Dunkeld.

Variety	Yield (t/ha)	% of site mean	WLYP % of site mean	Protein (%)	Test Weight	Retention (%)	Grade	Gross Income (\$/ha)
Oxford	6.96 a	114	89.2	9.93 a	65.9 ab	93.0	FEED 1	1,392
Westminster	6.86 a	113	87.9	10.70 ab	66.6 ab	97.0	FEED 1	1,372
Capstan	6.50 ab	107	83.3	10.63 ab	63.8 b	90.3	FEED 1	1,300
Commander	5.77 bc	95	74.0	10.47 b	64.4 ab	95.7	FEED 1	1,154
Hindmarsh	5.20 c	86	66.7	11.37 a	67.5 a	91.7	FEED 1	1,040
Gairdner	5.20 c	86	66.6	11.33 a	65.8 ab	87.0	MALT 1	1,066
<i>Mean</i>	<i>6.08</i>			<i>10.74</i>	<i>65.7</i>	<i>92.4</i>		

Means followed by same letter do not significantly differ ($P=0.05$, LSD). Grain yields were corrected to 12.5% moisture. Gross incomes represent the mean yield of each variety. Grain prices for Malt: \$205/t, Feed: \$200/t (Harvest delivery to Geelong Port. Source: Riordan Grain)

Graph 1. Yield difference when compared to the site mean (6.4 t/ha)



The other factor which significantly affected yield was the waterlogged conditions during the winter months at the site. Due to the very wet conditions many growers in this part of the Western Districts chose to sow their barley in the spring, once the ground had dried out. As we all now know we then had a very dry spring, with every month up to the end of the year well below average, which severely limited yield potential. The feed cultivars achieved relatively low protein levels, suggesting that there has been some potential yield left out in the paddock. Certainly for Oxford, a feed variety, an increased N regime may have resulted in higher yields without compromising end market value. However, with Gairdner, as is always the way when aiming for malting premiums, increasing N applications for yield gains can be risky when you do not want to take your protein levels above 12.0%

Gairdner was the only variety to achieve malting quality. However Commander's test weight mean value, although under the receival standard, is not significantly different to Gairdner's.

In discussing the proteins, the mean protein level of Commander was significantly lower than that of its malting counterpart Gairdner. However there was no significant difference between their yields. This suggests that Commander can provide greater flexibility in nitrogen management and withstand more marginal environments while still meeting protein standards. Low protein traits must be considered along with other variety selection options, such as resistance to diseases.

The 2011 season has highlighted the yield penalty that can be experienced when growing malting varieties. With the malt price offering just \$5/t premium over the feed price the returns from growing malt varieties are much reduced compared to feed varieties. This is mainly because of the lower yields of malting varieties.