# **1.2.1 Barley Variety Trial Inverleigh**

Location : Inverleigh (Vic)

Funding : Thanks to the members and sponsors of Southern Farming Systems for supporting the trial.

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Rainfall (mm) April – November : 233.3 mm The trial was not frosted, however did suffer from prolonged periods of drought and high temperatures.

#### Summary of Findings :

There are 2 commercially available varieties, namely Fleet and Capstan that performed very well in the trial. The effect of a foliar fungicide to control leaf disease (scald and spot form of net blotch) gave on average an additional 340 kg/ha yield which was cost effective on most varieties, even in a very low disease pressure situation.

**Background to the trial** : New barley varieties need to be thoroughly tested across a number of years before a recommendation can be made. This trial is one of many looking at grain yield and quality across a range of existing and new varieties. The trial also examined the effect of foliar fungicide on barley yield and grain quality.

## **Trial Inputs :**

Sowing date : 31<sup>st</sup> May 2006 Each variety seeding rate adjusted to establish 200 plants per square metre Fertiliser : 100 kg/ha MAP at seeding and 90 kg/ha Urea at

All varieties had their planting seed treated with Hombre except for Fleet and Flamingh which were treated with Baytan. Gairdner was included in the trial twice, with one line treated with Hombre and the other with Zorro.

Foliar fungicide 250 ml/ha Tilt was applied across 2 reps on 15<sup>th</sup> August, 1<sup>st</sup> September and 29<sup>th</sup> September. The 3 applications were to cover the different maturities in the trial. Normally only 1 application would have been applied given the low disease pressure.

Yield calculation based on a width of 1.45 metres and a plot length of 12 metres. The harvest width did not include the furrows where no crop was sown.

# Trial Design :

This was a 4 rep trial, with 2 reps being left unsprayed with foliar fungicide and 2 reps being sprayed.

## Trial Results :

Given the difficult growing season, very high yields were achieved in many barley lines. Table 1 gives the grain yield across the varieties tested for both the sprayed and unsprayed reps.

## Table 1

Entry	Variety	Yield + F	Yield - F	Yield Gain + F	Economic Response *
11	Fleet (WI 3804)	5.860	5.405	0.455	\$129
18	Capstan	5.695	5.310	0.385	\$109
19	WABAR 2315	5.625	5.370	0.255	\$72
14	WI 3586/1747 (Gairdner Plus)	5.620	5.160	0.460	\$131
4	WI 3416/1572	5.530	4.940	0.590	\$168
2	SW 2613	5.515	4.880	0.635	\$180
12	VBO 432	5.510	5.315	0.195	\$55
1	Buloke	5.450	5.300	0.150	\$42
9	Gairdner + Hombre	5.420	4.545	0.875	\$249
16	VBO 428	5.360	5.000	0.360	\$102
6	VB 0324	5.340	4.760	0.580	\$165
15	Baudin	5.135	4.755	0.380	\$108
3	SW Prefect	5.080	4.515	0.565	\$161
17	VBO 412	4.880	4.750	0.130	\$37
10	Gairdner + Zorro	4.870	4.755	0.115	\$33
13	VBO 313	4.860	4.915	-0.055	-\$16
8	Vlamingh	4.665	4.675	-0.010	-\$3
5	WI 3930	4.620	4.120	0.500	\$143
20	Sloop SA	4.565	3.845	0.720	\$205
7	VB 0324	4.455	4.615	-0.160	
Average		5.203	4.847	0.356	
CV		8.640	9.670		
LSD 5%		0.430	0.687		
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\* Economic response based on a net value of \$285 per tonne after fungicide application costs Yield – F: reps unsprayed with foliar fungicide Yield + F: reps sprayed with foliar fungicide to control leaf disease

Fleet was the highest yielding variety where a foliar fungicide was applied. Interestingly it was the highest yielding variety without the use of a foliar fungicide, although its yield was reduced by 0.455 T/ha by disease. Fleet is a feed quality line which is resistant to CCN and moderately resistant to the spot form of net blotch.

You need to take account of the LSD figure when comparing between varieties. In the case of the + fungicide treatment, any variety that yielded within 0.43 T/Ha of any other variety can be said to be the same ie not statistically lower or higher yielding. In this case, all varieties down to Buloke can be regarded as having similar yields.

Capstan is a surprisingly good feed variety, having yielded well in last year's trial at Inverleigh. This variety is worth considering as a feed variety. It is moderately susceptible to scald, powdery mildew, leaf rust and moderately resistant to the spot form of net blotch.

Buloke, a malting quality variety also performed well. It is a quicker maturing variety compared to Gairdner (Table 8) and gave good test weights and low screenings. The variety may not perform as well as some others in a higher rainfall year or environment.

The variety Sloop SA did not perform well and Vlamingh was also disappointing. This result needs to be viewed along with data from other trials. Sloop SA would appear to be too early a maturity type for this environment, particularly for a May/June planting.

The response to foliar fungicide varied significantly between varieties. There was a very low level of scald and spot form of net blotch in the trial, although the response by some varieties to foliar fungicide was significant.

Table 2 gives the protein % for the varieties for both foliar fungicide scenarios. The application of a fungicide made no difference to protein levels across the varieties.

#### Table 2

Entry	Protein + F	Protein - F
11	12.80	12.20
18	12.05	12.35
19	12.65	12.80
14	11.85	12.05
4	11.95	12.15
2	12.95	12.70
12	12.10	12.10
1	11.50	12.25
9	11.90	12.20
16	12.30	11.80
6	12.20	12.10
15	12.40	12.40
3	13.20	13.75
17	13.05	12.55
10	12.10	12.20
13	12.40	12.20
8	12.90	12.65
5	13.00	12.85
20	12.35	12.50
7	12.00	12.70
Average	12.38	12.43
CV	4.98	5.14
LSD 5%	1.20	1.12

Table 3 gives the effect of fungicide on test weight kg/hl across the varieties. The use of a foliar fungicide made no significant difference to test weight across all varieties

Table 3		
Entry	TW + F	TW - F
11	64.55	60.35
18	67.05	65.25
19	67.90	67.70
14	70.95	70.20
4	67.20	67.60
2	64.05	65.20
12	69.10	67.80
1	69.95	66.65
9	67.60	68.05
16	66.55	68.25
6	66.50	67.30
15	64.50	67.20
3	67.60	66.30
17	67.95	68.05
10	66.85	67.85
13	69.40	70.30
8	64.30	68.90
5	62.10	61.35
20	68.45	66.60
7	66.75	66.55
Average	66.97	66.87
CV	3.65	4.20
LSD 5%	3.24	4.23

Table 4 gives the grain retention percentage across a 2.5 mm screen for both the fungicide and nil fungicide treatments. The use of a foliar fungicide made no difference to grain retention on average across the varieties. There are however a couple of interesting observations, namely variety 19 (WABAR 2395) had the highest retention figure, whilst entry 5 (WI 3930) was very poor.

Table 4		
Entry	Ret + F	Ret - F
11	63.75	61.40
18	52.35	50.10
19	80.40	78.85
14	52.60	52.35
4	84.30	65.35
2	30.85	35.10
12	66.40	90.70
1	81.40	77.15
9	49.15	51.50
16	51.40	68.35
6	65.20	59.10
15	50.05	57.60

3	53.85	46.85
17	44.20	50.45
10	47.85	49.45
13	62.25	74.45
8	61.30	71.95
5	13.90	17.05
20	79.30	75.90
7	58.05	50.35
Average	57.43	59.20
CV	31.07	30.98
LSD 5%	14.44	21.60

Table 5 gives the thousand grain weight (TGW) across the varieties. Entry 11 (Fleet) the highest yielding variety also had the one of the highest TGW. Entry 1 (Buloke) gave the highest TGW. Interestingly the use of a foliar fungicide negatively impacted in TGW which was significant across all varieties.

Table 5		
Variety	TGW + F	TGW - F
11	41.55	41.70
18	35.00	35.35
19	37.80	36.95
14	36.45	35.20
4	37.45	35.15
2	28.40	30.20
12	33.75	36.70
1	42.90	43.85
9	36.30	37.90
16	29.30	34.90
6	33.60	34.35
15	31.15	33.40
3	32.15	30.90
17	32.35	35.45
10	34.05	36.60
13	32.30	36.55
8	31.30	33.90
5	29.10	29.65
20	36.05	37.40
7	37.20	34.80
Average	34.41	35.55
CV	11.68	9.99
LSD 5%	3.41	3.63

Table 6 gives the screenings % across the varieties. The CV for screenings is very high, so little value can be placed on the results. Despite this, varieties 2 (SW2613) and 5 (WI3930) gave extremely high levels of screenings. Fleet, Buloke and Sloop SA had low levels of screenings. The application of a foliar fungicide had no significant effect on the level of screenings.

Table 6		
Variety	Screen + F	Screen - F
11	5.50	5.70
18	12.75	9.65
19	4.60	4.80
14	8.60	9.85
4	8.20	10.35
2	23.15	20.55
12	6.45	4.20
1	2.15	2.55
9	13.50	8.75
16	19.30	5.45
6	7.50	9.70
15	13.15	10.95
3	8.90	10.80
17	14.70	12.05
10	13.75	8.95
13	9.50	4.45
8	11.90	6.65
5	25.80	20.60
20	5.10	6.55
7	9.15	13.60
Average	11.18	9.31
CV	61.97	62.87
LSD 5%	9.89	10.05

Table 7 gives the effect of foliar fungicides on yield and grain quality on average across the varieties.

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	Yield					
	+	Yield -	TW +	TW -	TGW +	TGW -
	Fung	Fung	Fung	Fung	Fung	Fung
Average	5.203	4.847	66.97	66.87	34.41	35.55
LSD 5%	1.2	592	0.83		0.	83
Significant						
difference 5%	Ye	es	No		Ye	es
	Screen	Screen	Ret +	Ret -	Protein	Protein
	_	_	_	_	_	_

	Screen + Fung	- Fung	Ret + Fung	Ret - Fung	+ Fung	- Fung
Average	11.18	9.31	57.43	59.20	12.38	12.43
LSD 5%	2.04	436	4.22	05	2.3	491
Significant						
difference 5%	N	0	Nc	)	N	0

Table 8 gives some further agronomic data comparing the grain weights at planting, maturities and plant height at harvest. There is a significant difference between the seed weight at planting compared to the harvested grain. It is also interesting to note the differences in maturities and plant height at harvest. The variety Capstan is an extremely short variety with excellent standability. Over 2 years of testing it has shown no signs of lodging or shedding heads prior to harvest.

#### Table 8

		Grain Wt at	Days to GS55 (mid	Days to GS55 cf	Plant height at
Entry	Variety	planting	flowering)	Gairdner	harvest
1	Buloke	49.7	114	-10	65
2	SW 2613 + Hombre	41.4	115	-9	54
3	SW Prefect + Hombre	45.9	119	-5	50
4	WI 3416/1572 + Hombre	52.2	121	-3	59
5	WI 3930 + Hombre	42.4	113	-11	45
6	VB 0324 + Hombre	52.2	112	-12	51
7	Flagship (WI 3408) HM 161	51.5	116	-8	61
8	Vlamingh + Baytan	45.5	115	-9	55
9	Gairdner + Hombre	46.6	124	0	54
10	Gairdner + Zorro	46.1	124	0	53
11	Fleet (WI 3804) TRC 6011 + Baytan	55.1	117	-7	56
12	VBO 432 + Hombre	44.5	123	-1	49
13	VBO 313 + Hombre	41.4	125	1	46
14	WI 3586/1747 (Gairdner Plus) + Hombre	43.8	124	0	50
15	Baudin + Hombre	43.5	119	-5	43
16	VBO 428 + Hombre	41.6	117	-7	44
17	VBO 412 + Hombre	40.3	118	-6	47
18	Capstan + Hombre	44.8	125	1	41
19	WABAR 2315 + Hombre	43.1	120	-4	50
20	Sloop SA	44.3	119	-5	58

Table 9 gives the establishment count and tiller count for each of the varieties. Some varieties did not establish as well as others. This could have been a germination or vigour problem. Tiller counts also varied significantly, with varieties such as Capstan tillering significantly and varieties such as Sloop SA tillering to a much lower extent.

#### Table 9

Variety	Establishment	Tillers per
	Count	square
	Plants/square	metre
	metre	
Buloke	172	661
SW 2613	117	1136
SW Prefect	89	717

WI 3416	100	1033
WI 3930	83	1328
VB 0324	139	914
Flagship	147	853
Vlamingh	175	1064
Gairdner + Hombre	117	1164
Gairdner + Zorro	139	1083
Fleet	125	1006
VBO 432	128	844
VBO 313	111	950
WI 3586	92	1175
Baudin	117	856
VBO 428	97	756
VBO 412	78	1078
Capstan	89	1258
WABAR 2315	128	936
Sloop SA	122	700

## **Trial Observations :**

The year was a particularly tough one, with low rainfall throughout the growing season. The earlier varieties would have been expected to perform better than the later flowering varieties, although this was not necessarily the case. The trial was very well grown and there was nothing that appeared to compromise the results.