

3.2 Wheat

3.2.1 Wheat variety trial - Inverleigh, Vic

Location: SFS Inverleigh Research Site

Funding:

This was an SFS Geelong Branch Funded Trial

Researcher(s):

Southern Farming Systems

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Summary of findings:

- The trial yielded an average of 6.87 t/ha. This was above the Water Limited Yield Potential* of 6.65t/ha, suggesting that as a mean figure across all varietal performance the trial outperformed its capability based on the growing season rainfall it received.
- Revenue was the highest yielding variety at 8.37 t/ha and Lincoln was the lowest variety at 5.60 t/ha.
- The majority of varieties were graded to the feed market, with Lincoln the only one achieving quality(H2)
- Harvest prices this season and the higher yield performance of feed varieties indicate there was no financial benefit in chasing quality premiums.

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:	595mm
Avg. Annual:	548mm
2011 G.S.R.:	377mm
Avg. G.S.R.:	407mm

Paddock History:

2009:	Bulk pea/Fallow
2010:	Canola

Soil Characteristics:

Soil Type:	Brown Sandy Loam
pH (1:5 CaCl):	5.6
P (Colwell) mg/kg:	66
K (Colwell) mg/kg:	280
Deep N (kg N/ha):	15.2
Organic Carbon%:	0.87

Yield Potential: The Water Limited Yield Potential (WLYP*) for this trial was 6.65t/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 160 plants/m²

Sowing date: 17th May 2011

Harvest date: 22nd December 2011

Plot size: 10 x 1.45 x 4 reps

Fertiliser:	17-May-11	MAP 100kg/ha
	25-Aug-11	Urea 150kg/ha

Herbicides:	17-May-11	Boxer Gold 2.5L/ha
		Roundup DST 2.3L/ha
	26-Jul-11	Axial 300ml/ha
		Precept 500ml/ha
		Adigor 500ml/ha

Fungicides:	5-Sep-11	Prosaro 0.15L/ha + Hasten 1l/ha
	26-Sep-11	Prosaro 0.15L/ha + Hasten 1L/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.
- Tillage type:** This trial was sown with the SFS cone seeder on 20cm row spacing's using 2.5cm knifepoints. Stubble burnt prior to sowing.
- Diseases:** There was early disease pressure in susceptible wheat varieties to *Septoria tritici* due to the wet start to the growing season. Stripe rust was also present, however it was adequately controlled and due to the dry end to the season, it did not cause too many issues. Stem rust was expected to be a problem in 2011, after the pressure experienced in 2010, but only small amounts were seen and again the weather did not favour the development of this disease.

Table 1. Wheat variety agronomic guide (Source: Victorian winter crop summary)

Variety	Max Quality (Victoria)	Maturity	Stem Rust	Stripe Rust	Leaf Rust	Yellow Leaf Spot	Septoria tritici
Revenue	Feed	L	R	R	R	MS-S	MR
Preston	Feed	M-L	S-VS	R-MR	R	S	MR
Beaufort	Feed	M	S-VS	R-MR	R	MR-MS	MS
Forrest	APW	L	R-MR	R-MR	MR	MR-MS	S
Einstein	Feed	L	-	MR	MR-MS	-	MR-MS
MacKellar	Feed	L	MR	R	S	MR-MS	MR
Bolac	AH	M-L	MR	R-MR	MS	MS-S	MS
Kellalac	APW	L	MS-S	MR-MS	S-VS	S	MS-S
Lincoln	AH	M	MR	R-MR	MR	MR-MS	S

Results and discussion:

The trial yielded an average of 6.87 t/ha for the 2011 season. Revenue was the highest yielding variety at 8.37 t/ha and Lincoln was the lowest variety at 5.60 t/ha. This is true for the local NVT trial at Teesdale also, however yield was down with Revenue 5.62t/ha and Lincoln 3.90 t/ha (see graph 2 below). The remaining varieties yielded between 7.28 and 6.47 and were not significantly different from one another.

The longer season varieties performed best, which is to be expected given the late season rainfall. It is likely that these top yielding cultivars made the most of the above average November rainfall (83.8mm) in terms of grain fill, which would have contributed significantly to yield.

This late season rainfall, although beneficial for the longer season red feed varieties, was most likely detrimental to the white wheat varieties. Lincoln was the only variety of the 4 non-feed varieties that achieved the quality standards. The majority of varieties achieved AGP1/FED1 quality. Mean test weights lower than the receival standard of 74kg/hl meant that Forrest, Bolac and Kellalac didn't make their intended grade.

Table 2. Grain yield (treated) and quality results from Inverleigh

Variety	Yield Treated (t/ha)	% of site mean	Protein (%)	Test Weight	Screenings (%)	Grade	Gross Income (\$/ha)
Revenue	8.37 a	122	9.6 f	72.0	0.3	FED1	1,506.6
Preston	7.28 b	106	10.5 de	72.6	0.0	FED1	1,310.4
Beaufort	7.25 b	106	9.7 f	69.9	1.3	FED1	1,305
Forrest	6.88 b	100	11.4 bc	73.5	0.7	FED1	1,238.4
Einstein	6.84 b	99	10.0 ef	69.7	1.0	FED1	1,231.2
MacKellar	6.63 b	97	10.6 de	72.6	1.0	FED1	1193.4
Bolac	6.51 b	95	11.7 ab	73.7	0.0	FED1	1,171.8
Kellalac	6.47 b	94	10.8 cd	72.7	1.0	FED1	1,164.6
Lincoln	5.60 c	82	12.4 a	74.9	0.3	H2	1,008
Mean	6.87		10.75	72.41	0.63		
LSD 5%	0.86		0.8	3.4	0.70		
CV	7.22		4.04	2.75			

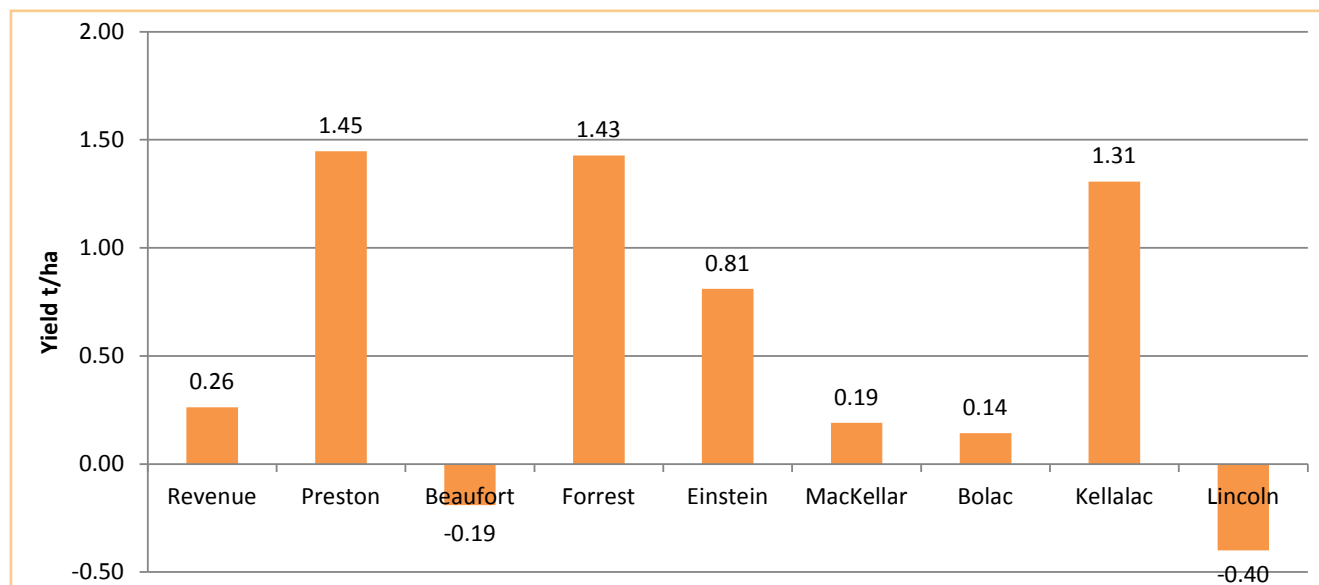
Means followed by same letter do not significantly differ ($P=0.05$, LSD). Grain yields were corrected to 12.5% moisture. Gross incomes represent the mean yield of each variety. Grain prices for H1=\$260/t, H2=\$220/t, APW/AVH2=\$200/t, ASW=\$185/t, AGP1/REDWHEAT/FED=\$180 (Harvest delivery to Geelong Port. Source: Riordan Grain)

The feed wheat varieties all had grain proteins less than 11%. This suggests that grain yield could of increased had more nitrogen been applied.

Across all varieties in the trial there was a 0.56t/ha yield increase where plots were treated with fungicide as opposed to receiving no treatment. All varieties of wheat at Inverleigh, except Beaufort and Lincoln, produced a greater yield when treated with fungicide (see graph 1 below). Preston and Forrest showed the greatest yield improvement of all varieties with the addition of the fungicide. They increased yield by 1.45t/ha and 1.43t/ha respectively.

These yield increases must be treated with caution as statistically they cannot be directly compared due to only one of the 4 reps being left untreated. Future work will address this and enable us to draw significant conclusions we can be confident in.

Graph 1. Yield difference as a result of fungicide treated vs untreated



Treated: 3 out of 4 replicates received fungicides. Untreated: 1 out of 4 replicates received no fungicides. These yield differences cannot be statistically confirmed.

However, the graph above does indicate that the use of fungicides can increase yield. One of the benefits of disease control through fungicides, particularly those that contain a mixture of active ingredients such as tebuconazole & prothioconazole in Prosaro, is the 'greening effect'. By increasing and maintaining the green leaf area for longer, keeping leaf necrosis at a minimum, you can expect to increase yield if moisture isn't limiting.

Disease resistance ratings must also be acknowledged in their contribution to yield and these should always be the starting point for varietal choice in high rainfall regions.



Image 1. Beaufort Wheat, Inverleigh

In this trial the price differential of quality over feed isn't enough to justify incurring a yield penalty that growing an AH variety can result in. Lincoln was the only variety in this trial to achieve its intended standard. At this seasons prices of \$40/t premium for H2 over Feed growers should question whether it's worth chasing the quality market. In order for Lincoln to be comparable to growing a high yielding red wheat such as Revenue, in terms of gross income, the H2 price would need to be at \$269/t. This is \$89/t over the feed wheat value. How often does this happen and is it worth the risk to your business if it doesn't happen? This basic analysis certainly indicates that financially you would be better off choosing robust, high yielding red feed varieties over the more susceptible white wheat varieties given the current yield differential.

Graph 2. Variety performance compared to 2011 NVT trial at Teesdale

