

2.1.2 Spring wheat variety trial - Bairnsdale, Vic

Location:

Bairnsdale Research Site.

Funding:

This was an SFS Geelong Branch funded trial.

Researchers:

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Background/Aim:

New spring wheat varieties need to be tested across a number of years before they will be considered in the domestic or export markets. This trial evaluates a number of varieties that are either commercially available or close to commercial release that may be suitable for the growing conditions the south east of Victoria.

Paddock History:

2008: Wheat & canola, 2007: Field peas, green manure crop

Soil Type: Sandy clay loam

Take home messages:

- The average yield for the spring wheat trial was 1.89 t/ha for the 2009 season.
- The shorter season varieties Derrimut and Beaufort were the highest yielding varieties with 2.78 and 2.38 t/ha respectively.
- The rapid finish to the season due to the unseasonal hot conditions in early November contributed to the shorter season varieties yielding better than the longer season varieties.
- The rapid finish also reduced grain quality where all varieties were downgraded on test weight and screenings.
- Time of sowing was also identified as a key outcome of this trial. Earlier sown Winter wheat and barley variety trials achieved greater yields and water use efficiencies.

Trial information:

Trial design consisted of a replicated randomised block design using 4 repetitions. Plot lengths were 18 metres long and 1.45m wide. Rainfall was highly variable throughout the season, with below average growing season rainfall. Late rainfall in November was not considered a contributor to yield results for this trial.

Rainfall:

Avg. Annual:	653.5mm, Bairnsdale 1942-2009
Avg. G.S.R.	479.8mm, Bairnsdale 1942-2009
2009 Total:	390.5mm, Bairnsdale Research Site
2009 G.S.R.	April – October = 259.2mm ¹
(Bairnsdale Research Site; 131.3mm below average)	

¹ Yield Potential: 1/3 of Jan (9mm) & Feb (44.2mm) with monthly totals above 20mm + ½ March (12.6mm) rainfall when total above 20mm + ((April – October rainfall) – 114mm*) x 20kg/mm/ha. In total December-March adjusted rainfall to stored soil water = 14.7mm, plus April-October = 259.2mm, minus evaporation factor of 114mm* => 159.9. Therefore, for Bairnsdale, the Wheat Variety Trial water limited yield should be 3.20t/ha, or 159.9mm x 20kg/mm/ha.

*Kirkagaard 2009, Evaporation intercept adjustment for a clay loam.

Treatment list:

16 current wheat varieties. Measurements included yield and grain quality components, including protein, test weight, screenings and resulting classification.

Sowing date: 3rd June 2009

Harvest Date: 24th December 2009

Sowing rate:

Seeding rate based on seed size with a desire to establish 160 plants/m².

Fertiliser:

100kg/ha MAP at sowing, Urea at 100kg/ha at stem elongation (28th August)

Herbicides:

- 3/6/09 Roundup P/max @ 1.5L/ha + Triflur 480 @ 1.5L/ha
- 2/9/09 Hoegrass @ 1.0L/ha + Lontrel @ 0.15L/ha + Wetter @ 0.25L/ha

Results and discussion:

The average yield of the spring wheat variety trial for 2009 was 1.89 t/ha. Derrimut was the highest yielding variety with 2.78 t/ha, followed by Beaufort with 2.38 t/ha. These results were reflected across the other SFS variety trial sites for 2009. These shorter season varieties yielded well, partly due to the rapid finish this season. The longer season varieties were unable to reach their full yield potential with the rapid finish to the year with unseasonal hot conditions in November.

The water use efficiency of the Spring wheats was somewhat lower than the Winter wheats and barley. This may be due to the later sowing date compared to the

other variety trials; this must be taken into consideration by crop producers for the 2010 season.

Grain quality was reduced across all varieties; this was caused by the rapid finish to the season with unseasonal hot conditions during early November. This hot period during grain fill reduced grain size and weight, thus reducing yields and test weights while increasing screenings. Table 2 shows that all varieties were downgraded due to these parameters, with screenings recorded as high as 16.5%. The hard milling varieties Derrimut, Lincoln, Bolac and Chara were also downgraded on protein as they were unable to achieve the required 13%.

Table 1: Grain yield, corrected to 12.5% moisture, sprayed with fungicide and compared to unsprayed check. A WUE calculation and comparison to the 2008 yield performance is also included.

Variety	¹ Yield (t/ha)	² Sig. Diff.	³ WUE % of 3.20t/ha	Quality Classification Potential
Derrimut	2.78	a	87	AH
Beaufort	2.38	ab	74	Feed
Eaglehawk	2.25	abc	70	APW
Espada	2.10	a-d	66	APW
Sentinel	2.00	bcd	63	ASW
VV2582	1.96	bcd	61	APW
Yenda	1.96	bcd	61	ASF
SUN525F	1.86	bcd	58	AH (prov)
Lincoln	1.85	bcd	58	AH
SUN555E	1.78	bcd	56	AH (prov)
Barham	1.64	cd	51	ASW
Bolac	1.63	cd	51	AH
HRZ 69	1.53	cd	48	APW (prov)
Chara	1.52	cd	48	AH
Gascoigne	1.50	d	47	APW
Kellalac	1.44	d	45	APW
Mean	1.89			
LSD (P=0.05)	0.732			
CV	27.18			
Trt Prob (F)	0.04			

¹ Consideration needs to be taken for yields, as plots represent 72.5% of arable area and thus should be calculated using this percentage for comparison to local and commercial results.

² Means followed by the same letter do not significantly differ (P=0.05, LSD).

³ Water Use Efficiency percentages are calculated based on the water limited potential yield of wheat at Bairnsdale for the 2009 growing season; being 159.9mm x 20kg/mm/ha, or 3.20t/ha.

Summary:

The average yield of the Spring wheat varieties was 1.89 t/ha for the 2009 season. The shorter season varieties Derrimut and Beaufort yielded 2.78 and 2.38 t/ha respectively. These varieties yielded well with the rapid finish to the season compared to the longer season varieties. Time of sowing can also be identified as a key factor in yield potential, where the earlier sown Winter wheat and barley variety trials achieved greater water use efficiency than the Spring wheats. The rapid finish to the season also contributed to poor grain quality, the key reason for downgrading grain was for test weight and screenings, and this occurred across all varieties.

Table 2: Grain quality analysis, including protein, test weight & screenings that contributes to final economic analysis of variety performance on a GM/ha basis (using standard inputs across all treatments of \$450/ha).

Variety	Yield (t/ha)	Protein % ¹ (min)	Test Weight kg/hl ¹	Screenings below 2.0mm ¹	Resultant Quality Classification
H1 Specs		13.0	74.0	5.0	
APW1 Specs		10.5	74.0	5.0	
Derrimut	2.78	12.3	71.5	9.8	AH => AUH2
Beaufort	2.38	11.7	66.9	16.5	Feed => Feed
Eaglehawk	2.25	12.6	70.2	11.5	APW => Feed
Espada	2.10	13.4	68.8	11.0	APW => Feed
Sentinel	2.00	13.6	69.1	6.3	ASW => AGP1
VV2582	1.96	12.2	72.4	9.8	APW => AUH2
Yenda	1.96	12.2	63.6	13.0	ASF => Feed
SUN525F	1.86	13.6	67.4	8.8	AH => AGP1
Lincoln	1.85	12.7	72.6	10.0	AH => AUH2
SUN555E	1.78	13.4	70.0	10.3	AH => AGP1
Barham	1.64	12.8	64.8	15.0	ASW => Feed
Bolac	1.63	12.6	69.0	7.8	AH => AGP1
HRZ 69	1.53	12.0	70.4	9.5	APW => AGP1
Chara	1.52	12.9	63.9	10.5	AH => Feed
Gascoigne	1.50	13.6	70.7	10.8	APW => AGP1
Kellalac	1.44	12.7	65.2	14.5	APW => Feed
Mean	1.89	12.8	68.5	10.9	
LSD (P=0.05)	0.732	0.824	4.786	3.220	
CV	27.18	4.52	4.89	20.65	
Trt Pr (F)	0.04	0.001	0.002	0.001	

¹Quality parameterisation is based on 2009-2010 NACMA Wheat Standards and should be used as a guide only. Cells with gray covers indicate readings outside preferred test range for highest achievable grade – testing undertaken at Riordan Grains, Inverleigh Office.