1.1.1 Wheat Variety Trial Inverleigh

Location: Inverleigh

Funding: Thanks to the members and sponsors for supporting the trial

Researchers: Thanks to Wes Arnott, Gary Sheppard, Rohan Wardle, Stacey Alexander, Louisa Ferrier and Colin Hacking for having input into the trial.

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Rainfall (mm) April – November : 233 mm. This was a particularly dry year (Decile 1) with the total January – December rainfall being 285.75 mm. Obviously yield was affected by the drought conditions. Whilst frost was a problem in the area, it did not cause any damage within the trial.

Summary of Findings:
A very dry year resulted in wheat yields being depressed, particularly with the later maturing varieties. Despite this, a number of varieties, both commercial and experimental, yielded very well. Grain quality was also affected, with generally high protein levels and screenings and low test weights and thousand grain weights. The highest yielding commercially available variety was MacKellar. There appears to be some very good experimental lines coming through the programme. The use of foliar fungicides had no effect on grain yield or grain quality apart from test weight.

Background to the trial: There are many wheat varieties to choose from which can create confusion in the minds of the growers. This trial is part of a series of experiments evaluating a number of varieties that may be suitable throughout south west Victoria. There are also a number of pre-release varieties under test. This experiment is a little unique in that evaluates the varieties in a nil fungicide and plus fungicide situation to determine the yield response of the varieties to controlling foliar leaf disease, principally leaf and stripe rust.

Trial Inputs: The trial was sown on the 26th May 2006. 100 kg/ha MAP was used at planting along with 90 kg/ha of Urea on 23rd August 2006. 250 ml/ha Opus was applied on 15th August, 1st September and 29th September to control leaf fungal disease to 3 reps of the 6 reps.

Trial Design: A replicated randomized block design consisting of 3 reps unsprayed with foliar fungicide and 3 reps sprayed with foliar fungicide. Plot length of 11 metres and plot width of 1.45 metres. The yield results are expressed without taking the width of the furrows into account. The total bed width is 2.0 metres.

Trial Results :

Table 1 gives the grain yield of the varieties ranked in decreasing yield order (sprayed with fungicide).

Entry	Variety	Yield + F	Rank	Yield - F	Rank	Yield Advantage T/Ha	Yield Advantage %	Days to GS55
23	NGSP005	5.133	1	4.467	3	0.666	12.97%	123
21	RAC 1262	4.633	2	4.533	1	0.100	2.16%	114
15	LPB1101	4.567	3	4.200	8	0.367	8.04%	121
24	NGSP006	4.533	4	4.367	4	0.166	3.66%	126
6	CS123.1	4.400	5	4.033	10	0.367	8.34%	130
19	VQ2621	4.367	6	4.067	9	0.300	6.87%	125
4	MacKellar	4.333	7	4.233	6	0.100	2.31%	144
18	VP1081	4.200	8	3.700	15	0.500	11.90%	124
27	Yitpi	4.200	9	4.500	2	-0.300	-7.14%	120
28	Pugsley	4.133	10	3.600	17	0.533	12.90%	124
3	Kellalac	4.033	11	3.500	19	0.533	13.22%	142
17	VN0870R	4.000	12	3.933	11	0.067	1.68%	129
1	Chara	3.933	13	3.900	12	0.033	0.84%	119
26	Clearfield Janz	3.867	14	3.500	20	0.367	9.49%	122
7	CS95102.1	3.833	15	4.267	5	-0.434	-11.32%	131
14	LPB03-0078	3.767	16	4.200	7	-0.433	-11.49%	126
8	HRZ02.1.61	3.633	17	3.767	14	-0.134	-3.69%	125
25	Amarok	3.567	18	3.300	23	0.267	7.49%	148
16	SUN509A	3.500	19	3.533	18	-0.033	-0.94%	116
20	Ruby	3.433	20	3.233	24	0.200	5.83%	115
2	Gregory	3.400	21	3.367	22	0.033	0.97%	120
9	HRZ02.2.16	3.200	22	3.833	13	-0.633	-19.78%	116
11	HRZ529.18	3.167	23	3.500	21	-0.333	-10.51%	139
22	BR6000W	3.100	24	3.200	25	-0.100	-3.23%	121
13	LPB03-027	2.967	25	2.600	28	0.367	12.37%	143
10	HRZ529.12	2.867	26	2.967	27	-0.100	-3.49%	148
12	HRZ03-6297.2	2.733	27	3.067	26	-0.334	-12.22%	124
5	Sentinel	2.733	28	3.600	16	-0.867	-31.72%	120
	Average	**3.794**		**3.749**		**0.045**		**127**
	LSD 5%	**0.527**		**0.709**				
	CV	**18.30**		**16.91**				

Key:

+ F = sprayed with foliar fungicide
- F = not sprayed with foliar fungicide

The highest yielding commercially available variety is MacKellar. This is a particularly good result given the relative lateness to flower of MacKellar. The days to GS55 give the time from planting to when 50% of the heads have emerged from the boot of the plant. MacKellar showed a

limited response to foliar fungicide, which is not surprising given the low level of infection of both leaf and stripe rust.

The best of the non commercially available varieties NGSP005 significantly outyielded MacKellar and will need to be watched in following years. There appears to be some new high yielding varieties coming through the programme. Some of the later maturing lines such as the HRZ lines were affected by the very dry growing conditions.

Kellalac again yielded quite well and still remains a viable option to grow.

Sentinel again was disappointing, although where it was not sprayed by fungicide it yielded better than where it was sprayed with fungicide. This is difficult to explain.

The co-efficient of variation (CV) is quite high at 18.30 (+F) and 16.91 (-F). Care needs to be taken in interpreting the results and you should review yield data from other "more normal" years before making a decision on what variety to grow.

Table 2 gives the grain protein % and screening % for the varieties

Entry	Variety	Protein % +F	Protein % -F	Screenings % + F	Screenings % - F
1	Chara	12.83	12.50	3.133	3.067
2	Gregory	11.80	11.60	3.633	4.300
3	Kellalac	12.40	12.47	2.567	2.967
4	Mackellar	11.13	11.17	7.667	7.433
5	Sentinel	12.40	11.93	2.867	1.900
6	CS123.1	10.87	10.80	4.867	6.500
7	CS95102.1	7.77	10.43	6.300	5.800
8	HRZ02.1.61	12.33	12.13	2.533	2.467
9	HRZ02.2.16	12.70	12.20	3.933	3.833
10	HRZ529.12	12.80	12.63	3.267	4.367
11	HRZ529.18	13.10	12.20	2.833	3.300
12	HRZ03-6297.2	12.80	12.27	4.200	5.433
13	LPB03-027	11.50	11.20	4.300	4.600
14	LPB03-0078	12.43	11.90	2.900	2.633
15	LPB1101	12.13	11.83	4.167	3.367
16	SUN509A	12.40	12.00	3.400	3.067
17	VN0870R	11.23	10.93	4.767	4.000
18	VP1081	12.23	12.10	2.267	2.533
19	VQ2621	12.27	12.73	2.667	3.033
20	Ruby	11.47	11.97	3.800	3.367
21	RAC 1262	12.23	12.00	3.933	12.470
22	BR6000W	14.57	12.13	5.033	4.600
23	NGSP005	11.53	13.67	4.300	4.900
24	NGSP006	12.07	11.60	6.567	5.833
25	Amarok	12.00	12.30	4.400	4.467
26	Clearfield Janz	12.43	12.50	2.433	3.000
27	Yitpi	12.20	12.07	4.300	5.067

28	Pugsley	11.73	14.47	3.467	3.100
	Average	**12.05**	**12.062**	**3.946**	**4.336**
	LSD 5%	**1.962**	**1.894**	**1.123**	**4.977**
	CV	**12.33**	**10.83**	**35.570**	**74.410**

The average grain protein 12.05 (+F) and 12.06 (-F) is quite high and reflects the dry finish to the grain fill. The CV reading is acceptable.

There appears to be a couple of anomalies in terms of the grain protein readings. In particular, Entry 7 was very low, particularly the +F treatment, which is hard to explain.

The very high screenings CV indicates that limited value can be placed on the results, although a consistent message seems to be coming through over several years of testing. MacKellar continues to give high screenings particularly compared tovarieties like Kellalac. Sentinel appears to produce good quality grain with small screenings.

Table 3 gives the test weight kg/hl (TW) and thousand grain weights (TGW) for the different varieties

Entry	Variety	TW +F	TW -F	TGW +F	TGW -F
1	Chara	73.03	70.60	29.73	28.43
2	Gregory	76.60	74.07	35.57	31.33
3	Kellalac	76.47	72.13	33.20	31.43
4	Mackellar	71.10	66.93	27.00	28.77
5	Sentinel	69.23	77.53	35.33	40.13
6	CS123.1	70.73	70.87	34.20	33.63
7	CS95102.1	64.07	60.20	32.30	26.27
8	HRZ02.1.61	75.53	74.83	33.00	31.60
9	HRZ02.2.16	74.10	74.10	34.20	37.77
10	HRZ529.12	75.50	68.53	32.63	33.43
11	HRZ529.18	71.07	67.53	31.73	30.57
12	HRZ03-6297.2	64.17	57.17	27.23	24.83
13	LPB03-027	58.93	57.77	33.20	24.30
14	LPB03-0078	68.83	64.97	30.57	31.13
15	LPB1101	73.70	73.20	34.73	34.33
16	SUN509A	70.07	70.37	29.63	30.93
17	VN0870R	75.20	70.57	31.43	30.03
18	VP1081	77.70	71.93	33.97	29.87
19	VQ2621	72.33	71.87	26.27	26.43
20	Ruby	78.97	77.00	35.70	35.00
21	RAC 1262	74.77	74.47	38.07	36.40
22	BR6000W	75.90	76.40	36.57	36.17
23	NGSP005	70.43	68.17	26.50	30.83
24	NGSP006	73.80	71.93	31.67	29.87
25	Amarok	72.93	70.53	32.13	31.70
26	Clearfield Janz	73.23	73.77	33.93	30.87
27	Yitpi	78.23	69.67	35.27	32.87

28	Pugsley	72.67	73.77	33.43	33.97
	Average	**72.47**	**70.39**	**32.47**	**31.53**
	LSD 5%	**7.993**	**8.704**	**5.91**	**8.98**
	CV	**14.06**	**11.54**	**14.06**	**19.64**

Both test weights and thousand grain weights were low compared to most years, reflecting the difficult season. The use of a fungicide did have a significant effect on TW (LSD 5% = 1.5) but not on TGW (LSD 5% = 1.35) – see Table 5. Of the experimental lines, RAC 1262 gave a relatively high TW and TGW which may explain its relatively high yield. MacKellar recorded very low TGW and TW results.

Table 4 gives plant counts at establishment, Tillers/sq metre and height of the canopy at harvest.

Entry	Variety	Days to GS55	Plant Counts /sq m	Tillers/sq m	Height cm
1	Chara	119	217	550	75
2	Gregory	120	206	500	80
3	Kellalac	142	214	531	73
4	Mackellar	144	231	894	55
5	Sentinel	120	211	531	70
6	CS123.1	130	203	686	58
7	CS95102.1	131	128	706	60
8	HRZ02.1.61	125	200	578	72
9	HRZ02.2.16	116	147	586	75
10	HRZ529.12	146	139	700	62
11	HRZ529.18	139	172	706	67
12	HRZ03-6297.2	124	133	617	68
13	LPB03-027	143	139	694	55
14	LPB03-0078	126	125	606	65
15	LPB1101	121	161	611	82
16	SUN509A	116	175	669	75
17	VN0870R	129	114	561	63
18	VP1081	124	181	631	78
19	VQ2621	125	172	806	78
20	Ruby	115	133	478	87
21	RAC 1262	114	142	456	70
22	BR6000W	121	122	433	90
23	NGSP005	123	164	419	70
24	NGSP006	126	131	461	72
25	Amarok	148	122	842	60
26	Clearfield Janz	122	150	478	80
27	Yitpi	120	103	494	78
28	Pugsley	124	125	586	80
	Average	**127**	**159**	**600**	**71**

Whilst we aimed to establish 200 plants/sq metre, with some varieties we did not achieve this establishment. This was probably due to a seed quality problem. In most cases, enough tillers were produced to achieve acceptable yields. The rule of thumb is 100 tillers/sq metre equates to 1 Tonne/hectare. Hence 400 – 500 tillers/sq metre should have produced 4 – 5 T/ha. In the case of MacKellar and Amarok in excess of 800 tillers/sq metre were produced. Obviously many of these tillers were lost prior to head emergence due to the dry conditions.

Table 5 gives the statistical analysis of the effect of fungicide application on grain yield and quality

	Yield T/ha	Protein %	Screenings %	Test Weight kg/hl	TGW g/1000 seeds
+ Fungicide	3.794	12.05	4.336	70.47	32.47
- Fungicide	3.749	12.06	3.946	70.39	31.53
LSD 5%	0.12271	3.627	0.66899	1.5186	1.3522
Sig Diff 5%	No	No	No	Yes	No

The use of a foliar fungicide only had a significant effect on average test weight across all varieties. This is not to say that there was not a significant effect on individual varieties.

Trial Observations: The trial was quite well grown, although a blockage in the seeder caused by the previous year's canola stubble did have some effect on some varieties, where only 7 out of the 8 rows were established. The drought had the biggest impact with some of the later maturing varieties being more adversely affected than the earlier maturing varieties.