

Advanced barley variety evaluation

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METHOD

Twenty-four barley varieties were sown on June 10 at 70kg/ha with 80kg/ha Mallee Mix 1, replicated three times. 50kg/ha urea was pre-drilled prior to sowing.

RESULTS

Table 1.15 Average yield, protein and screenings of barley varieties at Birchip

Variety	Classification	Yield % Schooner	Yield t/ha	Protein %	Screenings %
Arapiles	malt	77	2.59	16.1	31.6
Franklin	malt	68	2.27	16.8	59.2
Gairdner	malt	92	3.09	15.3	16.8
Parwan	malt	74	2.47	16.4	30.2
Picola	malt	71	2.39	16.0	23.3
Schooner	malt	100	3.36	14.8	15.1
Sloop	malt	101	3.41	14.8	11.8
Skiff	feed	90	3.01	16.2	35.1
Barque	feed	95	3.20	15.2	8.3
VB 9524	potential malt	88	2.95	15.0	22.0
VB 9527	potential malt	96	3.22	14.6	19.4
VB 9727	potential malt	102	3.42	15.6	34.8
VB 9728	potential malt	91	3.05	15.9	21.1
VB 9729	potential malt	114	3.82	13.9	21.3
VB 9733	potential malt	88	2.96	15.9	16.8
VB 9802	potential malt	80	2.68	17.0	33.4
VB 9807	potential malt	99	3.31	15.3	9.4
VB 9808	potential malt	96	3.21	14.9	16.6
VB 9811	potential malt	101	3.39	15.2	15.9
VB 9812	potential malt	98	3.30	15.5	9.7
VB 9817	potential malt	101	3.40	15.3	18.6
VB 9825	potential malt	79	2.67	16.4	31.1
VB 9827	potential malt	85	2.85	16.9	31.9
VB 9835	potential malt	104	3.50	15.8	31.8
Significant difference:			P<0.001 LSD=0.47	P<0.001 LSD=1.1	P<0.001 LSD=13.6

OBSERVATIONS

The yields were generally good. Based on growing season rainfall at Birchip, the yield potential for barley was 2.7 t/ha. Of the released varieties, Schooner and Sloop were the best yielding. There are several new AgVic lines (VB prefix), VB 9729 in particular, stood out at 3.82t/ha. High soil nitrate ensured that protein levels are all much too high to make malt barley. VB 9729 had the lowest protein at 13.9%. The lowest screenings were with Barque, VB 9807 and VB 9812. The highest were with Franklin with a big 59.2%.

1999 STATE BARLEY TRIALS SUMMARY

Sloop performed well in the Victorian stage 4 (S4) trials across Victoria, and this was reflected in the Birchip trial results. In contrast Arapiles and Arapiles derivatives (eg VB9802) performed very poorly in 1999. The highest yielding entry at Birchip was VB9729, a CCN resistant but highly scald susceptible line with promising malting quality. Unfortunately, due to the susceptibility of this line to leaf disease it will be deleted from further testing but will serve as an important parent in the program.

The most promising lines in the Victorian breeding program are VB9953, VB9733, and VB9802. Unfortunately one of these lines, VB9953, was not sown at Birchip due to seed unavailability at sowing. A 1999-2000 summer seed increase of these lines is currently occurring near Frances in southeast SA in the first of a two step seed increase program that will allow commercial production trials in 2001. A decision regarding the second stage of the seed increase program will be during 2000. The aim is to produce approximately 20 tonnes of seed of each line by December 2000 (based on micromalting results and discussions with the industry).

- VB9953 – a fast-tracked CCN resistant, moderately boron tolerant, potential malting variety. Compared to the performance of Schooner in S4 trials, VB9953 was 8% higher yielding in the Wimmera and of similar yield in the Mallee. Grain size assessment in a limited number of trials indicate VB9953 has significantly improved grain size, with an average 5% improvement in grain plumpness.
- VB9802 - a CCN resistant version of Arapiles considered as a possible replacement variety for Arapiles in the Wimmera. Seasonal conditions during 1999 with lower than average rainfall (60-65%) did not favour Arapiles, or Arapiles derived material. Consequently both Arapiles and VB9802 yields were 5-7% below Schooner in the Wimmera. The malting industry recognises the production of Arapiles will wane as higher yielding malting varieties become available. Malsters have shown a strong interest in the breeding of agronomically improved versions of Arapiles while maintaining a similar quality profile.
- VB9733 - an early maturing variety with good leaf disease resistances, relatively plump grain size and improved malting quality compared to Schooner and Sloop. Overall yields in the Mallee during 1999 were very similar to both Schooner and Sloop, despite lower yields in the Birchip trial. Initial micromalting results indicate VB9733 has 1.0 – 1.5% improvement in malt extract compared to Schooner and Sloop whilst maintaining diastase levels equivalent to Sloop.

In addition to these three lines, VB9727 was extremely high yielding in both the Mallee (5% higher than Sloop) and the Wimmera (highest yielding entry, including feed varieties, 7% higher than Sloop). Unfortunately VB9727 is quite susceptible to leaf scald and has only moderate grain size. The relative merit of evaluating this line further will be carefully assessed.

Of currently available varieties, Gairdner and Sloop are the two new malting varieties which growers should consider. Long-term yield results indicate Gairdner is generally higher yielding in the Wimmera with comparatively little difference in the Mallee. In the medium to high, annual average rainfall districts of North Central and North Eastern Victoria, Gairdner has a substantial yield advantage. When potential yields are expected to exceed 3t/ha, Gairdner is generally higher yielding than Sloop. In lower yielding environments, Sloop has an advantage except on heavy Wimmera soils (eg Minyip) where Gairdner tends to be higher yielding.

The phenology of Gairdner suggests that early sowing (May) should provide a yield advantage (in addition to improved grain size) for this variety in the Wimmera compared to Sloop. As the sowing date is delayed beyond mid-June, Gairdner will become increasingly later maturing relative to Sloop, reducing relative yields and resulting in higher screenings. However, Gairdner will not compete with weeds as well as Sloop and adequate weed control is essential before considering early sowing. This may create difficulties for Gairdner growers in those seasons with a late seasonal break. Gairdner has very satisfactory grain size when sown early and is free of foliar leaf disease. Time of sowing trials indicate the grain size of Gairdner deteriorates at a greater rate with delayed sowing date than for varieties such as Schooner, Sloop and Arapiles. The grain size of Gairdner will also deteriorate dramatically with severe epidemics of the SFNB. In contrast, relatively severe SFNB causes relatively little reduction in grain size for Sloop. Whilst Gairdner is inferior in terms of mean grain plumpness compared with Sloop, Gairdner has inherently lower grain protein concentration than Sloop. In situations where it is expected that grain plumpness is not likely to be of concern (eg early sowing) but grain protein may be high (eg high deep soil

nitrate), Gairdner may be more likely to achieve malting specifications. The converse situation also applies.

VARIETY DESCRIPTIONS

Arapiles	Matures about four days later than Schooner. Lower grain protein content (about 1%) than Schooner which may increase yields without losing the malting premium. Similar tendency to Schooner for head loss.
Barque	High yielding feed variety best suited to medium to high rainfall areas. Resistant to CCN. Direct replacement for Galleon.
Franklin	Very late maturing malt variety. High yield potential where annual rainfall exceeds 450mm.
Gairdner	Mid to late season feed varieties adapted to high rainfall areas. Susceptible to SFNB and CCN.
Parwan	Victorian malting variety with mid-season maturity suited to southern Victoria. Tends to have small grain size and susceptible to foliar diseases.
Picola	Parwan replacement with improved grain size and malting quality. Moderate resistance to SFNB but susceptible to scald and CCN.
Schooner	Widely adapted malting variety. Susceptible to CCN.
Skiff	Feed (with marginal malting quality) variety with very high yield potential. Suited to medium to high rainfall areas. Susceptible to CCN.
Sloop	Well adapted malt variety with excellent quality characteristics. Susceptible to CCN. Direct replacement for Schooner.
VB 9524	Very high yielding potential malting variety derived from Arapiles and Franklin.
VB 9527	Sister line to VB 9524. Slightly inferior straw strength and head retention. Potential malting, yield 5% higher than Schooner. Intolerant to boron. Susceptible to CCN but moderately resistant to scald.
VB 9727	Potential malting, yield same as Schooner. Intolerant to boron. Susceptible to CCN and very susceptible to scald.
VB 9728	Semi-dwarf potential malting variety. Yield 5-10% higher than Schooner. Intolerant to boron. Resistant to CCN but very susceptible to scald and SFNB.
VB 9729	Semi-dwarf variety with potential malt quality. CCN resistant but susceptible to both scald and SFNB.
VB 9733	Large grained potential malting variety. Excellent resistance to powdery mildew and reasonable resistance to scald and SFNB.
VB 9802	Potential malt quality in first year of state trials. Resistant to CCN.
VB 9807	Potential malt quality in first year of state trials. Resistant to CCN.
VB 9808	Potential malt quality in first year of state trials. Resistant to CCN and moderately resistant to SFNB.
VB 9811	Potential malt quality in first year of state trials. Resistant to CCN and moderately resistant to SFNB.
VB 9812	Potential malt quality in first year of state trials. Resistant to CCN and moderately resistant to SFNB, but very susceptible scald.
VB 9817	Potential malt quality in first year of state trials. Resistant to CCN.
VB 9825	Potential malt quality in first year of state trials. Resistant to CCN and moderately resistant to scald, but very susceptible to SFNB.
VB 9827	Sister line to VB 9728 but with scald resistance.
VB 9835	Potential malt quality in first year of state trials. Resistant to CCN and moderately susceptible to both scald and SFNB.

Table 1.16 VIDA advanced barley variety yield results (% of site mean yield) of stage four trials across Victoria

Variety	Manang-atang	Pira	MRS	Woome-lang	Merinnee	Murray-ville	Hopetoun	Rainbow	Comm. Eff(t/ha)	Mean
Arapiles	63.1	90.4	78.7	81.4	53.8	95.2	78.8	98.8	-0.74	80.0
Barque	110.0	110.6	106.3	105.1	104.9	112.8	101.1	101.6	0.124	106.6
Franklin	65.6	93.8	61.4	85.0	59.8	91.5	89.3	93.8	-0.659	80.0
Gairdner	104.4	110.1	84.5	106.6	97.7	102.1	102.9	95.3	0	100.4
Parwan	85.6	95.4	89.4	97.1	83.9	108.4	83.4	98.0	-0.308	92.6
Picola	54.1	95.1	82.6	81.1	48.6	103.3	78.7	95.7	-0.832	79.9
Schooner	101.8	95.9	117.5	95.7	111.3	91.2	101.5	106.2	0.135	102.6
Skiff	109.7	104.5	96.7	101.3	102.4	94.7	105.7	94.9	0.096	101.2
Sloop	107.4	98.7	108.2	116.3	107.6	96.4	104.8	102.2	0.153	105.2
VB9524	82.6	102.1	103.5	89.8	98.2	101.7	98.7	103.4	-0.127	97.5
VB9527	90.1	105.3	89.3	85.0	96.9	90.4	100.2	96.9	-0.113	94.3
VB9727	108.9	97.0	116.0	117.8	117.8	110.1	105.6	107.3	0.264	110.1
VB9728	107.3	96.3	94.6	119.9	105.8	97.5	100.1	92.2	0.095	101.7
VB9729	110.9	115.8	94.5	122.6	105.5	124.1	105.4	99.0	0.146	109.7
VB9733	112.0	94.4	109.9	99.4	107.3	93.7	110.8	110.9	0.195	104.8
VB9802	92.1	93.6	98.2	84.7	89.0	102.4	85.4	102.9	-0.211	93.5
VB9807	114.3	102.5	112.1	102.2	112.3	101.9	99.5	104.2	0.21	106.1
VB9808	112.0	102.3	105.7	100.2	114.8	95.5	104.1	108.2	0.226	105.4
VB9811	100.1	115.3	98.3	107.0	101.5	118.2	104.9	103.6	0.042	106.1
VB9812	99.9	109.7	99.5	101.9	97.1	112.9	104.2	100.8	-0.004	103.2
VB9817	120.2	96.4	111.5	102.5	127.1	87.1	116.0	89.3	0.422	106.2
VB9825	96.0	103.7	94.2	99.9	99.0	111.6	99.1	97.9	-0.045	100.2
VB9827	101.7	97.7	87.5	99.9	102.0	103.8	95.4	87.2	-0.019	96.9
VB9832	102.1	87.0	108.4	83.1	107.9	71.9	101.4	95.4	0.077	94.6
VB9835	113.9	90.0	119.2	92.0	120.8	83.1	104.4	103.9	0.296	103.4
VB9953	102.0	92.5	110.2	98.3	103.0	97.2	104.1	103.8	0.067	101.4
VB9956	101.3	92.0	105.3	103.3	97.7	96.1	102.5	101.5	0.008	100.0
WB232	105.6	103.6	105.9	114.0	107.6	89.7	108.4	107.1	0.155	105.3
WI2976	125.9	106.8	119.9	109.4	115.4	109.1	107.1	105.7	0.356	112.4
WI3102	99.3	101.3	91.0	97.2	103.5	106.7	96.6	92.3	-0.009	98.5
Site mean	2.05	2.61	2.49	3.10	2.09	2.15	3.94	4.08		