

## Barley Variety Development

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### Summary

- Growers in the Mallee and northern Wimmera should be aware that a CCN resistant Sloop type will be available to growers for the 2003 season. This variety has very similar agronomic performance to Sloop.
- Variety ranking for grain yield may be different when grown on deep sand. Growers in areas with deep sand should take care to gain additional information on varieties to be grown on these soil types.
- In the Wimmera, Gairdner continues to be the highest yielding variety. Growers need to be aware that Gairdner has inherently low grain protein concentration, and inadequate nitrogen nutrition will result in grain not acceptable for malting. Gairdner is also very susceptible to the Spot Form of Net Blotch but this has not seriously effected yields in the Wimmera to date.
- In areas with chronically low levels of Zn, yield response to the application of Zn may be achieved. Current varieties all appear to possess the same level of Zn efficiency.
- The VIDA breeding program is actively developing varieties with inherently low grain protein levels for use in the Mallee as a means of improving the percentage acceptance in malting categories. These varieties are unlikely to be suitable in the Wimmera where grain is often too low in grain protein concentration.

### Results

#### *DNRE Stage 4 evaluation trials*

Dry conditions during the early winter months resulted in moderately low levels of leaf diseases, particularly leaf scald, in the Victorian Mallee and Wimmera. Powdery mildew was present though not as severe as in 2000. Spot form of Net Blotch was widespread but not particularly damaging, whilst the Net Form of Net Blotch was observed more frequently than in past seasons. The cool spring conditions during 2001 provided ideal grain filling conditions for malting barley, with an exceptional level of grain plumpness being achieved. Grain protein levels were variable; in DNRE trials in the Mallee excessively high grain protein percentage occurred at many sites. The dry seasonal conditions favoured the earlier maturing varieties in the Mallee, and the early – mid season varieties in the Wimmera. Key observations are:

- ◆ CCN resistant feed varieties Keel and Barque were the dominant varieties in the Victorian Mallee (Table 1) with a yield advantage of approximately 15% compared to the malting varieties. Both these varieties also have useful resistant to the Spot Form of Net Blotch (SFNB).
- ◆ Yields of the malting varieties Sloop, Schooner, Gairdner and the new CCN resistant Sloop types (WI3167 and VB9953) were similar. Due to the mild spring conditions, all these varieties produced satisfactory grain size. Long term results indicate Gairdner will often fail to meet grain size specifications for achieving malting quality in the Mallee, although Gairdner does have inherently 0.5 – 1.0% lower grain protein content than Schooner and Sloop (see later report on low protein variety development).
- ◆ The CCN resistant Sloop replacements, WI3167 and VB9953, were evaluated for the second and third year respectively. Both have similar yield to Sloop, with WI3167 being slightly superior in lower rainfall districts (eg Birchip, Woomelang) and VB9953 being superior at sites with boron toxicity (eg Rainbow). These lines are currently being evaluated for malting and brewing quality. 1600 tonnes of VB9953 was produced in 2001 for brewing trials during 2002. Similar trials are being conducted on WI3167 in South Australia. On the basis of small-scale quality assessment the Victorian domestic malting industry strongly favours VB9953 in preference to WI3167.
- ◆ In the Wimmera (Table 2), Gairdner was the dominant variety and the CCN resistant feed varieties did not possess the same level of yield advantage over the malting varieties. Due to the inherent low grain protein content of Gairdner, some Wimmera growers failed to achieve malting quality due to excessively low grain protein content. In terms of the CCN resistant Sloop types, VB9953 was possessed a slight yield advantage in the Wimmera compared with WI3167. At sites where head loss occurred (Horsham) VB9953 was superior to WI3167.
- ◆ Yields of Torrens (formerly WI3107), a new hullless variety, specifically targeting the monogastric animal industry and speciality food markets, was approximately 20% lower yielding than the feed varieties in the Mallee and 30% lower yielding than the feed varieties in the Wimmera.

- ◆ Yields of Picard (formerly WI3102), a CCN resistant variety with niche malting market potential, were slightly lower than the CCN resistant Sloop types in the Mallee and similar to the CCN resistant Sloop types in the Wimmera.

#### *DNRE Deep-Sand tolerance trial*

Trials conducted in South Australia have indicated that Keel performs poorly when grown on deep sand whilst Mundah and the old variety Forrest have a reputation for performing well on deep sand. In the evaluation trial (Table 3) conducted on the crest of a sand ridge near Ouyen, Keel performed very poorly whilst Mundah and Forrest performed moderately well. Sloop and the CCN resistant Sloop (VB9953) were the highest yielding varieties. The ranking of the varieties in this trial contrast dramatically with variety ranking at the DNRE Stage 4 evaluation trials. In general, Keel performs very well relative to other varieties when grown on heavy soils, particularly in drought stressed situations, but other varieties should be preferred to Keel for growing on sand hills in the Mallee.

#### **Acknowledgments**

DNRE Stage 4 evaluation trials were conducted by Mr. Neil Vallance in the Mallee and Mr. Ashley Purdue in the Wimmera and co-ordinated by Mr. Alan Bedggood. Mr. Andrew Mathews and the barley breeding program staff conducted sand tolerance trials at Ouyen. The provision of land by local farmer co-operators is gratefully acknowledged.

**Table 1:** DNRE Stage 4 trial barley variety and advanced crossbred yields in the Victorian Mallee during 2001. Yields at each site are expressed as a percentage of the site mean, with predicted yields for the region calculated based on performance over all sites, weighted for site error and correlation with other sites.

| VARIETY           | Birchip | Hopetoun | Merinee | Murrayville | Pira | Rainbow | Walpeup | Woomelang | 2001 yields as a %<br>of overall mean<br>yield | Longterm yields as a<br>% of long term mean<br>yields |
|-------------------|---------|----------|---------|-------------|------|---------|---------|-----------|--|---|
| ARAPILES          | 99      | 93       | 94      | 97          | 96   | 96      | 82      | 99        | 97   | 94  |
| GAIRDNER          | 103     | 99       | 102     | 97          | 100  | 99      | 102     | 95        | 101  | 102   |
| SCHOONER          | 102     | 95       | 95      | 98          | 96   | 93      | 100     | 105       | 99   | 99  |
| SLOOP             | 106     | 100      | 100     | 95          | 101  | 96      | 95      | 109       | 103  | 100   |
| VB9953            | 99      | 98       | 99      | 108         | 99   | 105     | 90      | 103       | 99   | 100   |
| WI3167            | 112     | 100      | 99      | 103         | 102  | 95      | 98      | 108       | 104  | 98  |
| PICARD            | 79      | 91       | 89      | 93          | 89   | 91      | 86      | 80        | 90   | 98  |
| BARQUE            | 133     | 107      | 113     | 121         | 113  | 108     | 112     | 125       | 115  | 109   |
| KEEL              | 136     | 109      | 106     | 113         | 113  | 116     | 118     | 141       | 116  | 107   |
| TORRENS           | 97      | 90       | 95      | 97          | 93   | 88      | 90      | 112       | 96   | 94  |
| Site Means (t/ha) | 1.55    | 4.32     | 2.21    | 2.23        | 3.44 | 4.12    | 2.60    | 1.77      | 2.75   |   |

**Table 2:** DNRE Stage 4 trial barley variety and advanced crossbred yields in the Victorian Wimmera during 2001. Yields at each site are expressed as a percentage (%) of the site mean, with regional yields calculated as an average over all sites, without weighting for site error and correlation with other sites.

| VARIETY           | Brim | Charlton | Donald | Horsham | Kaniva | Minyip | Tarranyurk | Wallup | 2001 yields as a %<br>of overall mean<br>yield | Longterm yields as a<br>% of long term mean<br>yields |
|-------------------|------|----------|--------|---------|--------|--------|------------|--------|--|---|
| ARAPILES          | 94   | 98       | 97     | 52      | 93     | 85     | 99         | 81     | 90   | 92  |
| FRANKLIN          | 89   | 93       | 85     | 113     | 100    | 87     | 99         | 106    | 95   | 102   |
| GAIRDNER          | 106  | 103      | 106    | 114     | 107    | 110    | 111        |        | 108  | 110   |
| SCHOONER          | 91   | 96       | 91     | 73      | 88     | 91     | 86         |        | 89   | 93  |
| SLOOP             | 98   | 100      | 101    | 103     | 91     | 93     | 85         | 73     | 89   | 99  |
| VB9953            | 99   | 100      | 99     | 93      | 96     | 100    | 90         | 100    | 99   | 99  |
| WI3167            | 97   | 99       | 99     | 76      | 85     | 94     | 94         | 86     | 93   | 97  |
| PICARD            | 95   | 97       | 91     | 112     | 96     | 97     | 93         | 97     | 96   | 102   |
| WABAR2080         | 105  | 103      | 106    | 134     | 102    | 105    | 102        |        | 105  | 104   |
| BARQUE            | 105  | 103      | 105    | 112     | 101    | 101    | 118        |        | 105  | 106   |
| KEEL              | 116  | 111      | 123    | 119     | 94     | 111    | 96         |        | 105  | 107   |
| TANTANGARA        | 108  | 104      | 110    | 141     | 102    | 112    | 98         |        | 108  | 111   |
| TORRENS           | 76   | 86       | 71     | 53      | 81     | 68     | 85         |        | 76   | 89  |
| Site Means (t/ha) | 2.75 | 2.75     | 2.52   | 2.44    | 5.79   | 3.21   | 2.91       | 3.72   | 3.27   |   |

**Table 3:** DNRE sand response trial conducted at Ouyen determining relative barley variety yields on deep sand.

| VARIETY   | YIELD (T/HA) | YIELD (% SITE MEAN) |
|-----------|--------------|---------------------|
| BARQUE    | 1.841        | 107%                |
| FORREST   | 1.629        | 94%                 |
| KEEL      | 1.292        | 75%                 |
| MUNDAH    | 1.700        | 98%                 |
| SCHOONER  | 1.693        | 98%                 |
| SLOOP     | 1.908        | 110%                |
| VB9953    | 1.970        | 114%                |
| SITE MEAN | 1.728        |                     |
| CV %      | 6.7%         |                     |
| lsd (5%)  | 0.204        |                     |

