BARLEY VARIETIES AND AGRONOMY UPDATE 2011

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Take home messages

- Newer malting varieties are taking over from Schooner and Gairdner in southern NSW. Buloke, an export malting variety, is performing well in drier areas and for late sowing in wetter areas. Commander is slower to flower and appears best suited to medium rainfall areas. It best suits the domestic market, and may attract a lower malting premium.
- Hindmarsh is giving outstanding yields and is now being segregated as a “food” variety, at a price between feed and malt grades. It has a short coleoptile and care is necessary with seeding depth.
- Having crops flower at the right time is important to balance high spring temperatures with frost risk. While very early sowing gave good results in the drought years, it may lead to lower yields in closer to average seasons.

Barley continues to play an important role in southern NSW farming systems, helped by the release of higher-yielding varieties, concerns about leaf diseases in wheat, the requirement for weed competitive crops in managing herbicide resistance, and a desire to reduce risk by crop diversification. Barley can be valuable as a rotation crop with wheat, particularly in no-till and stubble retention systems, as it is not a host for most wheat foliar diseases. Its vigorous early growth allows it to compete well with weeds, needing lower herbicide inputs and restricting weed seed set.

Barley Varieties

Growers now have access to a number of new feed and malt varieties which have a range of improvements in yield, disease resistance and malting quality over older varieties. When choosing a variety they need to consider the available markets as well as agronomic performance. Market deregulation and the emergence of the container trade have led to a wider range of variety and marketing options for growers in NSW.

Schooner and **Gairdner** have been the preferred malting barley varieties in southern NSW, with smaller areas of Baudin. They have now been joined by **Buloke** and **Commander,** which offer higher yields but differ in potential markets. Of the non-malting varieties, **Hindmarsh** continues to perform well, particularly under drier conditions, while **Fleet** is a taller alternative which can lodge under favourable conditions, and **Oxford** is a longer-season variety with excellent straw strength and high yields. **Scope** is a new imidazolinone herbicide tolerant feed variety which is awaiting registration of a suitable herbicide. It is a tall, early to midseason variety, with a flowering time similar to Schooner. Both Scope and Oxford are undergoing malt evaluation.

Buloke

Now a fully-accredited malting variety suited to the export market, the area sown to Buloke is expected to increase. It continues to perform well in mid-lower rainfall areas and as a later sown option in wetter areas.

Commander

Commander is a mid maturing malting variety with yield potential rivalling current feed varieties and excellent grain size in terms of both screenings and retention. It is likely to suit domestic breweries and some export markets, and may attract a lower malt premium than other varieties. It is later to flower than Schooner and Buloke (see later) and appears to perform best under higher-yielding conditions (e.g. > 3 t/ha).

Fairview

Fairview is a proprietary malting variety grown under contract to Malteurop for supply to the malt plant at Geelong. It has similar maturity to Gairdner with improved straw strength, leaf rust resistance and competitive yield under favourable conditions including irrigation.

Hindmarsh

The NVT across sites and years analysis shows Hindmarsh to be the highest yielding variety in southern NSW. This, combined with good agronomic characteristics, has led to its rapid adoption. It has not been accredited as a malting variety, primarily because its beta-glucan levels tend to be high and variable. However, it has been placed in a new “food” category, and may be segregated for human food, being possibly used for shochu and for malt production in some markets, but is likely to attract a lower premium than malting varieties.

Results for selected varieties from southern NSW NVT trials in 2010 are shown in Table 1 and plump grain (retention) results in Table 2. The wetter season allowed some of the slower varieties to yield well, including Oxford and Urambie. Hindmarsh, as expected, did well at the most western site (Merriwagga) but also at the highest yielding site (Quandialla). For malting, Gairdner performed well at the more eastern sites but Buloke and Commander were better at Merriwagga. Grain plumpness (Table 2) was only a problem at Merriwagga, where Hindmarsh was outstanding. These results are only from one year, and in deciding on varieties for 2011, growers should consider the across season results available shortly on the NVT website and in the 2011 I&I NSW Winter Crop Variety Sowing Guide.

Table 1. Grain yield (t/ha) for selected varieties in southern NSW NVT trials in 2010.

Variety	Quandialla		Wagga		Lockhart		Merriwagga	
	t/ha	%	t/ha	%	t/ha	%	t/ha	%
Baudin	5.53	98	3.01	107	3.93	100	2.97	86
Buloke	5.33	94	2.79	100	3.92	100	3.66	106
Commander	5.66	100	2.93	105	3.48	89	3.55	103
Flagship	5.26	93	2.47	88	3.62	92	3.54	103
Fleet	5.93	105	2.78	99	4.24	108	3.88	113
Gairdner	5.46	96	3.14	112	4.22	108	3.02	88
Hindmarsh	6.10	108	2.94	105	3.99	102	3.78	110
Oxford	6.79	120	3.22	115	5.16	132	3.59	104
Schooner	5.31	94	2.60	93	3.60	92	3.26	95
Scope	4.76	84	2.31	82	3.78	96	3.89	113
Urambie	6.64	117	2.72	97	4.14	106	3.63	106
CV%	*5.9*		*7.3*		*6.9*		*6.9*	
LSD (t/ha)	*0.55*		*0.36*		*0.45*		*0.45*	
Sow date	*23 May*		*7 June*		*20 May*		*20 May*	

Table 2. Retention values (plump grain, percentage above a 2.5 mm screen) for selected varieties in NVT trials in 2010.

Variety	Quandialla	Lockhart	Merriwagga
Baudin	89.0	92.3	58.0
Buloke	74.2	91.1	52.4
Commander	85.7	90.1	65.2
Flagship	77.6	89.5	75.3
Fleet	85.6	97.6	81.8
Gairdner	58.4	91.1	36.6
Hindmarsh	87.0	91.9	78.1
Oxford	77.3	93.8	65.7
Schooner	80.4	93.3	70.7
Scope	76.5	93.0	75.3
Urambie	75.4	87.9	39.6

Southern Barley Agronomy Project

Southern Barley Agronomy, a tri-state initiative supported by GRDC, has been established to produce management advice for barley, particularly newly released barley varieties. Research partners include I&I NSW, Birchip Cropping Group, Southern Farming Systems and SARDI. A complimentary Northern Project is conducted by I&I NSW and QDPI&F. A major focus is on the suitability of varieties for no-till farming systems, and the differences between varieties in terms of weed competitiveness, herbicide tolerance and nitrogen and row spacing responses. Some initial results from 2010 are presented here, but at the time of writing (Jan 2011) detailed statistical analyses and grain quality measurements have not been completed.

1. Sowing time

Sowing time is a major determinant of crop yield because, in partnership with the variety chosen, it determines the timing of key development stages and the environmental stresses at these key stages. Crop yields are particularly sensitive to stresses in the period from about 3-4 weeks prior to flowering through to the start of grain fill as this is when grain number is determined and stem reserves are accumulated.

Changes in crop management have given farmers more flexibility in sowing time. The availability of herbicides for fallow weed control and the swing to direct drilling and no-till means that crops can be established on the autumn break without the delays caused by pre-sowing cultivation. This ability plus a run of dry seasons has prompted many growers to establish crops earlier in autumn, so that flowering occurs much earlier. The response to early flowering in a dry season such as 2009 is shown in Figure 1**.** This shows the flowering time and yield of each of 32 varieties sown at 3 dates. Highest yields came with flowering

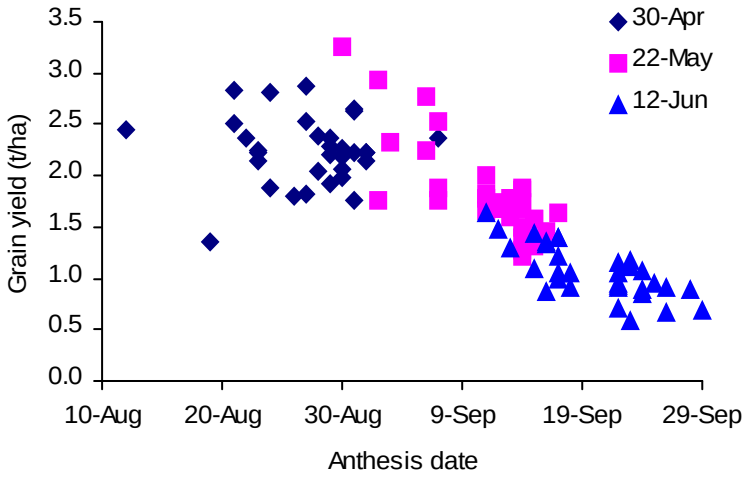

Figure 1. Relationship between yield and flowering time for barley varieties sown at 3 dates at Condobolin in 2009

between 20th August and 6th September. Yields dropped rapidly with later flowering, the loss being about 0.5 t/ha for each week delay. This is in stark contrast to 2010 (Figure 2), when

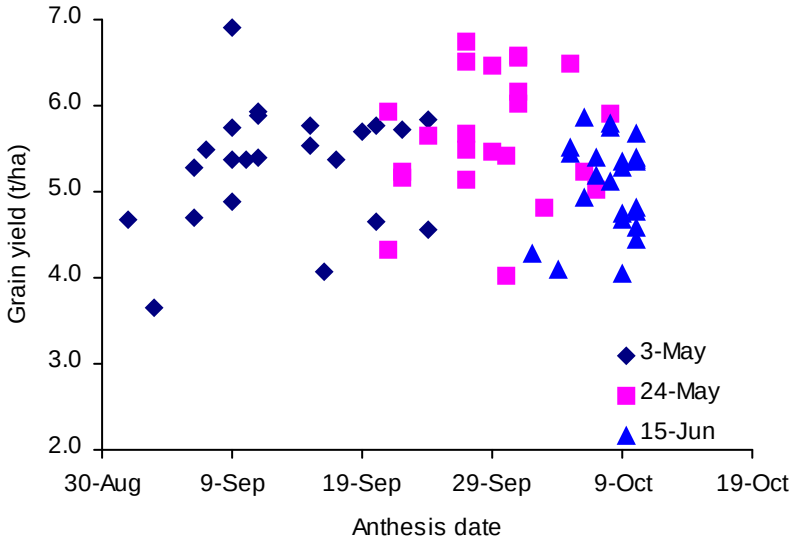

Figure 2. Relationship between yield and flowering time for barley varieties sown at 3 dates at Condobolin in 2010

yields were highest in crops which flowered in late September, and the yield decline with later flowering was less severe. The lower yields with early September flowering could be partly explained by frost but also by very early flowering crops having made insufficient growth to form enough grains to maximise yield. Frost damage was observed in early flowering crops in 2010, a reminder that while barley is less sensitive than wheat it can still suffer severe damage. The preferred flowering date will vary with local topography and the grower's attitude to risk, but for Condobolin the third week of September is probably a good compromise. This can be achieved in most years by a third week of May sowing for varieties such as Hindmarsh and Buloke, while Commander could be sown about a week earlier.

2. Seeding rate and sowing time

The effect of sowing rate and sowing time on four barley varieties (Buloke, Commander, Gairdner, Hindmarsh) was also investigated at Condobolin in 2010. Three rates were used, namely 50, 100 and 150 seeds/m^2; the 100 seed rate equated to between 40 and 55 kg/ha depending on the variety and seed source. This highlights the need to consider seed size when determining a sowing rate.

Yield increased significantly with seeding rate in Hindmarsh (Figure 3), but not in the other varieties. Despite its high tillering ability, this variety responds well to inputs such as seeding rate and phosphorus fertiliser. However, its short coleoptile means that care must be taken with seeding depth.

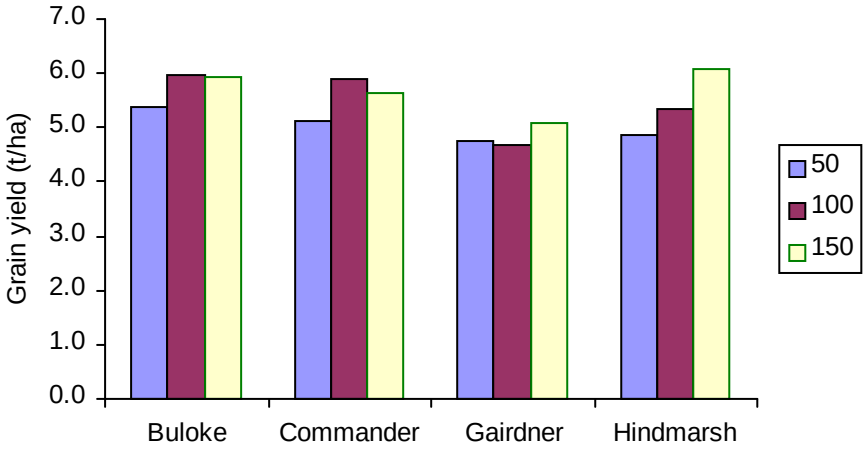

Figure 3. Effect of seeding rate (seed/m^2) on yield of four barley varieties, averaged over three sowing dates

The response to seeding rate was consistent across sowing times, so the interaction was not significant (Figure 4). Higher seeding rates are generally recommended with late sowing but the long, cool finish to 2010 probably allowed the thinner crops to tiller and grain fill, even from a June sowing. Grain quality data from these trials is not yet available but past work indicates that in barley, screenings increase as seeding rates are increased, so high seeding rates are not advisable in drier regions.

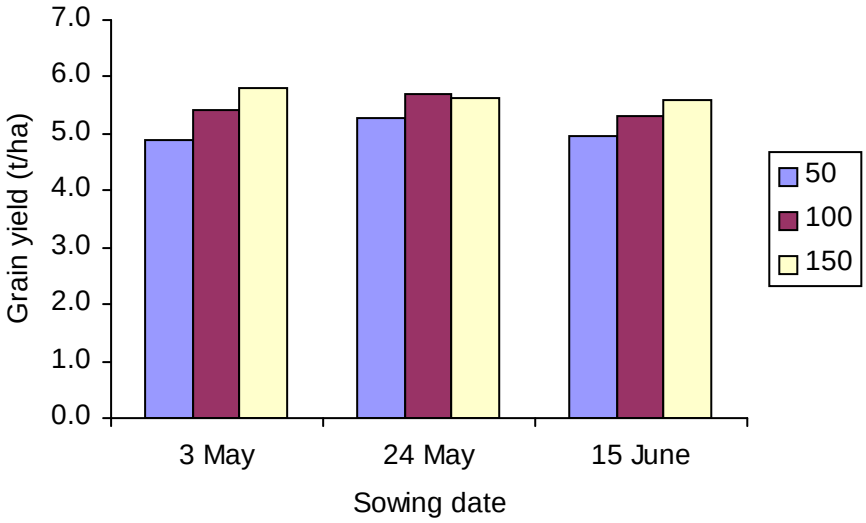

Figure 4. Effect of sowing time on seeding rate (seeds/m^2) response, averaged over four varieties

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