Advanced wheat variety evaluation

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SUMMARY

Seasonal conditions in 1999 were variable, which was reflected in the differences in site yield means across the Mallee. The earlier maturing lines were favoured with **Krichauff** and **Silverstar** being the highest yielding of the named varieties, while the winter line **Rosella** performed poorly. The variety **Camm** did not look impressive during growth, however, yielded quite well. **Meering** and the recently released line **VK237** suffered from a poor start which we believe was associated with poor seed quality associated with the late frost in the 1998 season. **Yitpi** and **Frame** both yielded equally well.

The Victorian wheat breeding program based at the Victorian Institute for Dryland Agriculture (VIDA), aims to develop, evaluate and release varieties that maximise economic return to the farming community. Varieties must be high yielding, disease resistant and possess good agronomic characteristics. Grain quality must also meet the stringent demands of the market place.

METHOD/RESULTS

The advanced wheat variety experiment located at the BCG site was one of ten similar sites located throughout the Mallee region in 1999. Each site consisted of 33 named varieties and crossbreds. Each site was randomised and replicated three times. The dry September reduced yield potential in the majority of sites. The exceptions being the Hopetoun and Murrayville sites, which yielded 3.1 and 3.0 t/ha respectively. The Quambatook wheat evaluation site was the only trial where valid results were difficult to interpret due to soil compaction and poor emergence.

INTERPRETATION/COMMERCIAL PRACTICE

The yellow leaf spot disease that was evident in the varieties **Frame**, **Yitpi** and **Camm** at the September field day had little effect on yield due to the dry conditions at post flowering. The crossbred **VM931** yielded very well, both in these trials and interstate. However, it is marginal for leaf rust resistance and is likely to be of APW quality. A decision on its release will be made in March 2000. Small grain size and higher than acceptable screenings in **Silverstar** at harvest was a concern to growers. This may limit the adoption of this variety to more reliable areas. Research into increasing the seeding rates of wheat is indicating promising results in improving grain size and reducing screening levels.

Table 1.17 Wheat variety comparisons in the Victorian Mallee (% Meering yield) for the 1999/00 crop

Variety	Birchip	Hope-toun	Manang-atang	Merinee	Murray-ville	Woom-elang	Walpeup	Ultima	Robin-vale	Mallee Means
Site mean(t/ha)	2.21	3.12	2.03	1.63	3.00	2.95	1.65	1.37	1.93	2.22
Krichauff	127	111	117	116	109	107	125	109	110	111
Silverstar	142	112	113	113	105	108	137	106	109	109
Camm	125	109	113	112	106	108	115	109	108	108
Yitpi	121	104	112	111	105	102	117	115	107	108
Frame	112	104	112	110	106	105	114	108	107	107
Mira	102	99	105	105	103	102	117	105	103	103
Janz	115	102	103	103	97	101	109	101	102	102
Ouyen	106	103	101	101	99	100	98	101	100	101
Meering	100	100	100	100	100	100	100	100	100	100
Goldmark	117	100	99	99	97	97	105	97	99	99
Diamondbird	113	96	93	94	94	93	116	91	96	96

Chara	82	88	86	87	91	87	107	93	92	91
Rosella	68	88	71	74	86	90	81	90	83	82
VM931	137	110	115	114	109	107	127	103	109	110
VK237	118	100	103	102	99	96	110	106	102	102

Released from VIDA in 1999, VK237 is widely adapted and high yielding hard wheat with excellent rust resistance and CCN resistance that performed well at Birchip. It will be classified as either AH or APW during 2000 pending grain quality results from the 1999 harvest. Yield performance in Victoria from the 1999 crop was below the long-term trend; this is believed to be associated with poor seed quality from the late frost in 1998. In interstate trials where the seed was derived from local sources, yield levels have continued the long-term trend. SGB have the commercial rights to VK237 and commercial quantities of seed will be available for the 2001 season.

WHEATS FOR 2000 AND BEYOND

Yitpi – (96080, 59-1)

Released from the Waite Institute program in 1998, Yitpi is being marketed as a direct replacement for Frame. Currently classified as APW in Victoria, there is some chance it will be classified as AH in the future. Yitpi is resistant and moderately tolerant to CCN, moderately resistant to stripe and stem rust but susceptible to leaf rust. Improved resistance to stripe rust over Frame. Yitpi also has moderate tolerance to boron. Grain yields are similar to, or slightly better than, Frame and is not prone to high levels of screenings. AWB Seeds have the rights to Yitpi. Commercial quantities of seed are now available.

Mira – (VG127*14)

Released in 1998 from VIDA, Mira is best adapted to the Wimmera's medium rainfall environments. It has comprehensive rust resistance and CCN resistance and a tendency to highest relative yields under high yielding conditions. Mira produces a similar level of screenings as Ouyen. It is of APW quality. AWB Seeds have the rights to Mira. Commercial quantities of seed will be available for the 2001 season.

Chara – (VI341)

Released in 1998 from VIDA, Chara is AH quality, but is likely to be accepted into APW in Victoria. Chara combines triple rust resistance with CCN resistance and high yield potential in the moderately acidic soils of central and north-eastern Victoria and southern New South Wales. AWB Seeds have the rights to Chara. Commercial quantities of seed will be available for the 2001 season.

Kukri – (RAC820)

An AH variety from South Australia with very high dough strength. Not likely to be favoured by the domestic industry, it is strictly an export wheat aimed at the yellow alkaline noodle, blending, aquaculture and frozen dough markets. Kukri is very early maturing and is resistant to all three rusts, but susceptible to CCN. Yields are only moderate (98% of Janz in SA) and growers would need to attract a significant price premium to grow Kukri in Victoria. Commercial quantities of seed should be available for sowing in 2001. Kukri will be protected under Plant Breeders Rights and is yet to be licensed to a commercial company.

Wylah – (M5487)

Released from NSW in 1999, Wylah is a winter wheat with AH quality in NSW (likely to be APW in Vic). Maturity and yield are similar to Rosella. It is resistant to stem rust, moderately resistant to stripe rust and moderately susceptible to leaf rust. Wylah was included in the Victorian yield trials in 1997 and performed relatively poorly. It is suited to early sowing. SGB have the rights to commercialise Wylah. Seed is available for sowing in 2000.

VK237 – (Janz/Beulah)
Released from VIDA in 1999, VK237 is a widely adapted, high yielding hard wheat with excellent rust resistance and CCN resistance. It will be classified as either AH or APW during 2000, pending grain quality results from the 1999 harvest. Yield performance in Victoria from the 1999 crop was below the long-term trend. This is believed to be associated with poor seed quality from the late frost in 1998. In interstate trials where the seed was derived from local sources, yield levels have continued the long-term trend. SGB have the commercial rights to VK237. Commercial quantities of seed will be available for the 2001 season.

Arrivato
Durum wheat released by Heritage seeds. Arrivato has not been evaluated in Agriculture Victoria trials. Seed will be available for the 2001 season. It is licensed to AWB Seeds.

Table 1.18 Positives and negatives of alternative varieties for the 2000 season

Variety	Positives	Negatives
Camm	High yield, good rust resistance, boron tolerance, CCN tolerance.	No CCN resistance. More susceptible to yellow spot than most varieties.
Chara	High yield on acid soils. Prime hard quality, rust and CCN resistant. Good root lesion nematode resistance and tolerance.	Poor yield on alkaline soils. Appears to be more susceptible than most varieties to the sulfonurea herbicides.
Diamondbird	High yield on acid soils, good rust resistance.	No CCN resistance.
Frame	High yield, large grain, boron tolerant, CCN resistant and tolerant.	Tendency to lodge under high yield, marginal resistance to stripe rust. More susceptible to yellow spot than most varieties.
Goldmark	Good rust and CCN resistance.	Disappointing yield in tough finishes of the past three seasons. Appears to be more susceptible than most varieties to the sulfonylurea herbicides.
Goroke	Good rust and CCN resistance.	
Janz	Broadly adapted.	No CCN resistance. More susceptible to black point than some other varieties.
Krichauff	High yield, good leaf and stem rust resistance. Resistant and tolerant to both species of RLN, tolerant to boron.	Marginal for stripe rust resistance. ASW quality (yellow flour).
Whistler	High yield on acid soils, winter habit for flexibility of sowing time. Acid soil tolerance.	ASW quality.
Wylah	Winter habit for flexibility of sowing time. Likely to be APW in Victoria.	Little yield information for Victoria.
Meering	Proven performer. AH quality.	No CCN, leaf or stem rust resistance.
Ouyen	AH quality. CCN resistant	Some tendency to high levels of screenings. Relatively low protein achiever.
Rosella	Winter habit for flexibility of sowing	ASW if delivered to the pool. Inherently lower in

	time. Noodle wheat can attract a premium if marketed well.	falling number than most other varieties.
Silverstar	High yield, AH quality, CCN, stem and stripe rust resistant	Tendency to produce high levels of screenings. Sow at high rates to minimise screenings. Relatively low protein achiever.
Yitpi	High yield, stripe rust resistance is better than Frame. CCN resistant and tolerant, boron tolerant, large grain.	More susceptible to yellow spot than most varieties.

Table 2. Traits of recently released wheat varieties and comparators

Variety	Rust Resistance			CCN		*Septoria tritici*	Yellow Leaf Spot	Lodging Resist-ance	Max Quality	Relative Maturity
	Stem	Stripe	Leaf	Res	Tol					
Camm	R	R	R	S	MT	S	S-VS	M	APW	E
Chara	MR	MR	MR	R	I	MR	S-VS	M	PH	E
Frame	MR#	MR-MS	MR-MS	R	T-MT	MS-S	S-VS	L	APW	E-M
Goldmark	MR	MR	R	R	I	MR-MS	S-VS	M	APW	E-M
Kukri	MR	R	R			MR-MS			PH	
Mira	MR	R	MR	R	I	MR	S-VS	M	APW	E
Silverstar	MR	MR	MS	R	I	MR-MS	S-VS/R*	M-L	AH	VE
VK237	R	MR	R	R	MI	MR-MS	S-VS	M	AH/APW?	E
Wylah	R	MR	MS	S		MR-MS	MS	M	AH	M (W)
Yitpi	MR	MR	S	R	MT	MS	S-VS		APW	E-M

* Seedling resistant, adult susceptible.

Susceptible to the Sr30 attacking race.

R – resistant, MR – moderately resistant, MS – moderately susceptible, S – susceptible,
VS – very susceptible, T – tolerant, MT – moderately tolerant, MI – moderately intolerant,
I – intolerant, M - moderate, L – low, VE – very early, E – early, M – mid, W – winter.

The easy answer to the question, 'what variety should I grow?, is the one that makes you the most money in the long-term. I qualify it with 'in the long-term' because some varieties have benefits that are not realised until later in the rotation. Resistance to CCN is for most growers the most important of these. Grain yield is the single biggest determinate of returns and given almost all of the varieties we have to choose from are of either APW or AH quality all have the potential to achieve a premium in the market. Risk is the next most important factor and here we can include issues such as the probability of meeting the quality grade whether it is through reaching the required protein, or meeting receival standards for screenings or falling numbers etc. Table 1.19 lists most of the varieties growers are likely to grow in this region and their positive and negative points.

Table 1.19 What to sow in 2000 (*in alphabetical order)*

Environment	First preference	Second preference
Mallee	Camm (if have CCN control) Frame Ouyen Silverstar (non boron sites) Yitpi	Goldmark Janz Meering
Wimmera	Camm Ouyen Silverstar Yitpi	Goldmark Goroke Janz Meering