

Wheat varieties – Wimmera



Fiona Best (BCG)

Take home messages

- *There are no standout wheat varieties for the Wimmera. Growing 2 varieties reduces the risk of financial loss due to a single variety's weakness.*
- *Yitpi is still a useful variety in the Wimmera but should be complimented by a second variety to reduce exposure to the risk of stem rust.*
- *Correll, Derrimut and Young are stem rust resistant and have performed well in recent years. The risk of low test weight in Correll also needs to be managed by growing more than 1 variety.*
- *Scout yielded well in this trial but limited data is available.*

Background

Wheat variety choice is a constant challenge with each variety having different agronomic characteristics to consider. The 2009 season provided an opportunity to see how some of the new varieties performed in a tough finish in the Wimmera.

In the Wimmera, Cereal Cyst Nematode (CCN) resistance, stripe rust and stem rust disease ratings are key traits to consider when choosing a variety as well as yield and quality.

Aim

To evaluate new wheat varieties and assess their suitability to the Wimmera.

Method

This trial was a replicated complete randomised block design. The sowing rate for each variety was determined by calculating the 1000 grain weight and assuming 90% germination. The targeted plant density was 150 plants per metre square (plants/m²). The equation used to determine the sowing rate was:

$$\text{Sowing rate (kg/ha)} = \frac{(1000 \text{ grain weight (g)} \times \text{Targeted Plant Density})}{\text{Expected Germination (\%)}}$$

The trial was managed according to best practice, applying nitrogen (N) and fungicides when required. The trial was sown at 2cm depth. The trial was harvested on 3 December. Grain yield was converted to 12% moisture. A sub-sample was taken from each plot and measured for grain protein (%), screenings (<2.0mm) and test weight (½ hecta litre).



Location: St Arnaud
Replicates: 4
Sowing date: 22 May 2009
Seeding density: 150 plants/m²
Seeding equipment: Knife points, press wheels, 30cm row spacing
Fertiliser: 22 May 55kg/ha Supreme Z (N10:P21.9:K0:Zn1)
7 July 50L/ha UAN (26kg N/ha) diluted in 60L water and applied at 110L/ha
Herbicides: 21 May Roundup PowerMax (1.5L/ha)
Goal 75mL
22 May Triflur X (2L/ha)
20 August Ally (5g/ha)
Jaguar (700mL/ha)
Hasten (1% v/v)
Fastac Duo (200mL/ha)
Fungicide: 30 September Tebuconazole (140mL/ha)

15 varieties were compared in the trial (Table 1).

Table 1. Wheat variety agronomic and disease ratings information.

Variety	Supplier	Quality	Maturity	CCN	Stem Rust	Stripe Rust	YLS
Yitpi	AWB seeds	AH	M	MR	S	MR – MS	S – VS
Correll	AGT	AH	M	MR	MR – MS	MR – MS	S – VS
Catalina	AWB seeds	AH	M	R	MR – MS	MR – MS	MS – S
Espada	AGT	APW	-	MS	MR	MR – MS ^{Yr17}	MS
Derrimut	Crop Care	AH	E – M	R	R – MR	MS ^{Yr17}	MS – S
Young	ABB Seeds	AH	E – M	R	MR	MS ^{Yr17}	MR – MS
Axe	AGT	APW	E	S	MS	MR	S
CLF_STL	Nufarm	APW	M	S	MS	S	S
Gladius	AGT	AH	M	MS	MR	MR – MS ^{Yr17}	MS
Peake	NuSeed	AH	E – M	R	MR – MS	MR – MS	MS – S*
Lincoln	Pacific Seeds	AH	E – M	S	R – MR*	R – MR	MR
Crusader	Pacific Seeds	APW	E – EM	MS	R – MR	MR – MS ^{Yr17}	MR
Scout	Long Reach	APW	M	MR	R – MR	MR – MS	S
LPB04-0965	Long Reach	APW	M	S	MR	MR – R ^{Yr17}	S
LPB05-2148	Long Reach	AH	E – M	n/a	MR*	MR ^{Yr17}	S

Quality: AH = Australian Hard, APW = Australian Premium Wheat

Maturity: E = early, M = mid, L = late

Disease Ratings: VS = very susceptible, S = susceptible, MS = moderately susceptible, MR = moderately resistant, R = resistant
Yr17 = the later rating applied to the WA pathotype YR17, * = rating yet to be confirmed

Results

The new variety Scout was the highest yielding variety at the St Arnaud site (Table 2). Other high yielding varieties were Peake, Correll and Derrimut yielding between 2.2 and 2.3t/ha. Yitpi, Catalina, Young and LPB04-0965 all yielded 2.1t/ha. The poorest yielding varieties were Crusader, CLF_STL and LPB05-2148.

Table 2. Crop production data from the St Arnaud site.

Variety	Grain yield (t/ha)	Grain yield (% Yitpi)	Long-term average grain yield (% Yitpi)	Comments
Yitpi	2.1	101	100	Still yielding well but stem rust risk must be considered.
Scout	2.5	118	–	Limited data, APW only. One to watch.
Peake	2.3	113	99	Early maturity suited season. Mixed performance in previous trials.
Correll	2.2	105	100	Yields well. Stem rust resistant but can have test weight problems. Compliments Yitpi.
Derrimut	2.2	104	101	Good performer if stripe rust managed. Compliments Correll or Yitpi.
Young	2.1	102	100	Early maturing. Yields well with stripe rust management. Prone to high screenings in some situations. Good second wheat.
LPB04-0965	2.1	99	–	APW, CCN susceptible.
Lincoln	2.1	99	–	Has wide yield adaptation but CCN susceptible.
Catalina	2.1	99	95	Good vigour, but yields behind others.
Gladius	2	98	101	Does well in dry years, no CCN resistance. Second wheat if CCN managed and Boron toxicity is an issue.
Espada	2	98	–	Does well in dry years, no CCN resistance.
Axe	2	95	101	Very early maturing, no CCN resistance.
CLF_STL	1.8	87	–	CLF_JNZ is more suited to the Wimmera.
LPB05-2148	1.7	82	–	Limited data.
Crusader	1.3	64	–	Good disease profile but low yielding.
Sig. diff LSD (P<0.05) CV(%)	P<0.001 0.1 4.1	P<0.001 10.2 7.0		

*Note: Long-term averages 2000 – 2007 were sourced from DPI 2009 Winter Crop Summary in the Wimmera district.
Some data was not available.*

All varieties were hit very hard by the hot weather in November with screenings above 5% across all varieties, apart from Crusader which recorded a screenings percentage of 3.5 (Table 3). Worst of the varieties for screenings at the St Arnaud site was Correll with 9.5%, followed closely by Peake at 8.7%.

Protein recorded across all varieties at the site came in over the 11.5 threshold for H2 harvest classification (Table 3). LPB05-2148 and Crusader recorded the highest protein of 15.2% and 14.8% respectively. The lowest protein levels were recorded in Derrimut, Yitpi and Correll.

Test weights were also below average across the varieties with Yitpi recording the highest at 76.8g (Table 3). Falling below the test weight minimum for H2 of 74g were Correll, Espada, Gladius, Peake and Crusader.

Given screenings, test weight and protein considerations, all treatments received a harvest grade of GP1. Using a GP1 price of \$170/t, gross incomes were calculated for each treatment. The gross income achieved by Scout was \$425/ha. The lowest gross income, \$221, was achieved by Crusader due to a low yield.

Table 3: Grain quality and income of the various varieties.

Variety	Grain protein (%)	Screenings (%)	Test weight (g)	Harvest grade	Income (\$/ha)
Yitpi	11.8	6.5	76.8	GP1	357
Correll	11.9	9.4	72.3	GP1	374
Catalina	12.1	6.3	74.9	GP1	357
Espada	13.5	6.9	73.5	GP1	340
Derrimut	11.5	7.1	74.6	GP1	374
Young	12.0	7.6	75.6	GP1	357
Axe	12.8	6.5	76.3	GP1	340
CLF_STL	12.2	8	76.5	GP1	306
Gladius	12.7	7.5	73.4	GP1	340
Peake	12.0	8.7	73.4	GP1	391
Lincoln	12	8	74	GP1	357
Crusader	14.8	3.5	71.8	GP1	221
Scout	12.0	6	75.8	GP1	425
LPB04-0965	12.2	8.2	74.5	GP1	357
LPB05-2148	15.2	5.8	74.7	GP1	289
Sig. diff	P<0.001	P<0.001	P<0.001		
LSD (P<0.05)	1.1	2.3	2.4		
CV (%)	6	23.4	2.2		

Interpretation

It is difficult to make recommendations for varieties based on the results of a single trial at a single location. The results from this trial need to be considered with other Wimmera variety trials (eg NVT) and long term data. Yield was influenced by the hot finish and quality influenced by the heat and the rain prior to harvest.

There are currently no clear best bets for wheat varieties in the Wimmera as most of the current high yielding varieties seem to have an achilles heel of some sort.

For example, Correll while high yielding has a tendency for low test weight, Yitpi is susceptible to stem rust and Derrimut requires stripe rust management. Peake has been less widely adapted but could have some potential. The earlier season varieties Gladius and Espada and the high yielding Lincoln do not have CCN resistance and Scout has limited data available and is only APW quality.

The most prudent strategy is to grow more than one variety to spread risk. Comments on possible fits are provided in Table 4.

Given the late harvest rain experienced this year, some varieties proved prone to sprouting compared to others. This seemed to be a combination of maturity and inherent sprouting susceptibility. Axe, Correll, Catalina and Espada can be susceptible to sprouting under these circumstances. This means that these varieties would need to be prioritised during the harvest program to reduce the risk of rain damage.

There are differences in sprouting tolerance between varieties. The following list is the result of laboratory tests where all varieties were treated the same (Table 4). The germination (sprouting) index ranges from 0 (= very tolerant) to 1 (= very intolerant).

Table 5. Lists the tolerance of some varieties to sprouting.

Variety	Germination Index (0-1)	Tolerance
Gladius	0.87	I-VI
Espada	0.87	I-VI
Axe	0.84	I-VI
Wyalkatchem	0.75	I
Correll	0.74	I
Mace	0.64	MI-I
Yitpi	0.58	MI
Frame	0.57	MI
Janz	0.53	MI

VI = very intolerant, I = intolerant, MI = moderately intolerant.

The most susceptible varieties to sprouting appear to be those that are better suited to hot dry springs. In recent years, there has been a greater impact from hot, dry springs on the bottom line than sprouting.

As was mentioned at the St Arnaud field day in October, herbicides tolerance also varies between varieties. As part of a current GRDC project co-ordinated by the SA Research and Development Institute (SARDI), cereal and pulse varieties are being investigated for their tolerance to commonly used herbicides and tank mixes. SARDI research trials in both 2006 and 2007 found that Hussar (registered product of Bayer CropScience) reduced grain yield in Gladius by up to 18% when applied at the registered rate and timing. Relative to other varieties, Buloke barley was also found to have increased sensitivity to Cadence as did Yallara oats to Tigrex and Banvel M. Seasonal conditions and time of application can greatly influence the effects of herbicides on crops. Though this work is ongoing, it does provide guidance for growers to select safer herbicide options for their sown cultivar and/or select more tolerant cultivars for these important herbicides.

Acknowledgments

This project was funded by Victorian DPI Ag Industry grant.

