Wheat Variety On Farm Demonstrations

Kate McCormick, John Stuchbery and Assoc.

Why was it conducted:
On-farm testing of new varieties aims to compare the performance of emerging and current varieties in large plots. In 2002, Wimmera Farming Systems (WFS) joined forces with TOPCROP in the Wimmera to test several wheat varieties on 14 farms.

How it was conducted:
On-farm demonstration trials were conducted on 14 farms across the Wimmera. Wimmera Farming Systems members hosted trials at Minyip, Lubeck, Wonwondah and Rupanyup. Wimmera TOPCROP groups hosted trials at Rainbow, Netherby, Winiam, Kaniva, Goroke and Natimuk. The sites were partially replicated using the nearest neighbour layout with a control variety grown in every third plot. The control variety for each trial was the variety grown by the farmer. Mitre, Yitpi, Chara and H45 were grown at all sites. Additional varieties were included based on guidance from the WFS steering committee, TOPCROP and local interests. Almost 20 varieties were evaluated in total. The plots were sown, maintained and harvested with farm equipment. Plots were 8-10m wide and 90-100 m long.

Results:
Eleven of the 14 sites were harvested. All the participating farms received well below their average growing season rainfall and consequently the average yield per site varied from 0.3t/ha at Rainbow and Rupanyup North to 2.3t/ha at Goroke. Protein ranged from 12 to 17% and screenings varied from 1 to 15%. Most sites had screenings below 5%. There was little varietal difference for protein and screenings.

Table 1 summarises the yield performance of varieties at each site relative to the control variety for that site. Yields of test varieties were classified as higher than (+), similar to (=) or lower than (-) the control variety. Statistical analysis was used to account for site variability. Control variety yields were classified as higher than (+), similar to (=) or lower than (-) the site mean. Each variety was then given an overall yield rank from 1 to 5 with 1 being the highest yielding varieties and 5 being the lowest yielding across the sites. These rankings are summarised in Table 2.

Table 1. Yield performance relative to control variety (marked with*). Variety yields were classified as higher than (+), similar to (=) or lower than (-) the control variety yield. Control varieties were classified as higher than (+), similar to (=) or lower than (-) the site mean.

	WFS				TOPCROP							
Location	Min	Rup	Lub	Won	Rain	Net	Kan	Win1	Win2	Gor	Nat	**2002 Yield Rank[2]**
GSR (mm)	110	175		215	90	143	194	154	154	206	196	
Soil Type[1]	GC	GC	RC	GC	SL	CL	GC	RC	GC	GL	GC	
Site Mean Yield (t/ha)	0.7	0.3	1.4	2.0	0.3	1.5	0.5	1.4	1.5	2.3	0.4	
Annuello	=	-			-	+	=	=	=	=	=	**3**
Babbler	=	-	=	=			=				=	**3**
Chara	-	-	=	-	=	+	-	-	-	-	-	**5**
Frame					=	+	=	=	=	=	=	**2**
Goroke				**=***								
H45	=	=	=	=	+	=	=	-	-	+	+	**2**
Janz					-	+	**=***	-	=	=	=	**3**
Mitre	**=***	**=***	=	+	=		=	**+***	**+***	=	**+***	**1**
Lorikeet			=	-								**3**
Silverstar					**=***							
Whistler			=	=								**3**
Wylah			-	-								**4**
Wyalkatchem	+	+									+	**1**
Yitpi	=	-	**=***	+	-	**=***	=	=	+	**=***	+	**2**

1. Soil type: SL Sandy Loam; GC Grey Clay; GL: Grey Loam; RC Red Clay; CL Clay Loam
2. 2002 Yield Rank: 1 = highest yielding, 5 = lowest yield

Table 2. Summary of 2002 wheat variety yield rankings from WFS Demonstration Trials. *The number of sites tested is in brackets.*

2002 Yield Rank	Varieties
1	Mitre (10) Wyalkatchem (3)
2	Yitpi (11) Frame (7) H45 (11)
3	Annuello (3) Babbler (3) Janz (3) Whistler (2) Lorikeet(2)
4	Wylah (2)
5	Chara (11)

Commercial Practice

These results identify varieties that were better adapted to the dry conditions, and those that were less adapted. Variety choices should not be based solely on the 2002 experience. These comparisons should be considered with past on farm performance and long term DPI variety trial results. Other factors such as disease resistance levels should be considered.

Mitre: performed well at most sites. Mitre is one of the preferred varieties for medium rainfall areas and is adapted to both the northern and southern Wimmera. Mitre may have black pointed grains and high screenings in some years.

Wyalkatchem: yielded well but was only grown at 3 sites. Although it has high yield potential, Wyalkatchem is susceptible to Stripe Rust and is therefore not suited to growing in the Wimmera region. The suggested minimum level of disease resistance for Stripe Rust in medium rainfall districts (>350mm) is Moderately Resistant (MR) where as Wyalkatchem is rated as susceptible (S). Wyalkatchem is also susceptible to CCN.

Yipti and Frame: are generally well adapted to tougher conditions, and this was illustrated at most sites. However, at some sites Yitpi did not perform as well as expected.

Yitpi is the preferred variety for difficult soils in the North Wimmera. There are better options for higher rainfall areas.

H45: yielded well at most sites but not as well as expected given its early maturity. Although resistant to Yellow Leaf Spot, H45 is moderately susceptible (MS) to Stripe Rust and S to Septoria. In medium to high rainfall areas, H45 may be seriously at risk from foliar disease. Although it is useful as a late sowing option or for sowing into wheat stubble, the high disease risk needs to be considered. H45 is also susceptible to CCN.

Annuello, Babbler, Janz: Annuello and Babbler are both essentially Janz replacements suited to low and medium rainfall areas. The Janz types generally had mixed results this season under the dry conditions. Annuello has superior foliar and root disease resistance to Babbler and would be the better choice if seeking a Janz replacement.

Chara: is a similar type to Annuello, Babbler and Janz but is later maturing, and does not cope well with dry finishes, hence its poor performance in 2002. This variety is best suited to medium to high rainfall areas and to acid soils (North Central, North East, Western district, south of Horsham). Chara needs to be sown early (mid may) if sowing north of Horsham.

Lorikeet, Whistler and Wylah: are winter type wheats with a similar growing season to Rosella. These varieties were only tested at two sites. Whistler seemed better adapted to the dry season. Wylah performed poorly. Lorikeet is a noodle type wheat similar to Rosella, Wylah is APW and Whistler is ASW quality. Long season wheats are best suited to higher rainfall environments or early sowing.

Acknowledgments
Thank you to the Petering, Teasdale, Velthuis, Gready, Clugston, Launer, Deckert, Bell, Crouch, Maybery and Sudholz families for hosting the trials.

PlantTech, AWB Seeds and SunPrime Seeds supplied seed. GrainCorp Murtoa conducted quality testing.

The enthusiastic efforts of Horsham TOPCROP staff are gratefully acknowledged.