



# VALUE ADDED WHEAT CRC PROJECT REPORT

## Australian wheat varieties released recently

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## CRC Project Report No 72

### Australian wheat varieties released recently

This report provides updated information about wheat varieties for the Australian wheat industry, in the following appendices:

- Appendix 1. Grade acceptances and preferred varieties for the 2007/08 harvest
- Appendix 2. Quality-related attributes and genes for Australian wheats
- Appendix 3. Profiles of varieties released during the past two years

This information supplements the earlier reports of the Value Added Wheat CRC in this series:

- Cornish, G.B., Tonkin, R., Howes, N., Chin, J., Wu, M., and Wrigley, C.W. (2006). Varietal identity - increasingly important in the Australian wheat industry. Value-Added Wheat CRC Report No 60. Value Added Wheat CRC, North Ryde, NSW.
- Cornish, G.B., Batey, I.L., and Wrigley, C.W. (2002). Australian wheat varieties: Grain quality data on recently registered varieties. Report No 8 of the Value-Added Wheat CRC, North Ryde, NSW.
- Wrigley, C.W., Cracknell, R.L., Miskelly, D., Cornish, G.B., Sharp, P., and Mares, D. (2001). Current Australian wheat varieties: Grain quality data. Report No 48 of the Quality Wheat CRC, North Ryde, NSW.

Information about specific varieties, their quality attributes and the genes involved is also available in searchable form in the computer program *GeneJar*. See also Whiting (2004) and web sites for ACAS ([nvtonline.com.au](http://nvtonline.com.au)), AWB Ltd ([awb.com.au](http://awb.com.au)), AWB Seeds ([awbseeds.com.au](http://awbseeds.com.au)), Graintrust ([graintrust.com.au](http://graintrust.com.au)), Australian Grain Technology ([agtseeds.com](http://agtseeds.com)), PlantTech ([planttech.com.au](http://planttech.com.au)) and the Grains Research and Development Corporation ([grdc.com.au](http://grdc.com.au)).

### RECENTLY RELEASED WHEAT VARIETIES

The sheets in Appendix 3 provide profiles of the following varieties that have been released during the past year, thus up-dating the single-sheet profiles provided in the above CRC reports. These variety pages are reproduced, with permission, from the 2006 and 2007 reports of the Cereal Varieties Sub-Committee (published in the conference handbooks of the Royal Australian Chemical Institute's Cereal Chemistry Division. The cooperation of T. Watts and R. Williams is acknowledged. The varieties listed in Appendix 3 are:

Barham <sup>Ⓞ</sup> ( <i>VO2697R</i> )	Jandaroi <sup>Ⓞ</sup> ( <i>Line E</i> )
Binnu <sup>Ⓞ</sup> ( <i>WAWHT2734</i> )	LongReach Catalina <sup>Ⓞ</sup> ( <i>LPB0268</i> )
Bolac <sup>Ⓞ</sup> ( <i>VQ2621</i> )	LongReach Crusader <sup>Ⓞ</sup> ( <i>LPB03-1073</i> )
Bullaring <sup>Ⓞ</sup> (WA WHT 2589)	LongReach Dakota <sup>Ⓞ</sup> ( <i>LPB0780</i> )
Carinya <sup>Ⓞ</sup> ( <i>SUN421T</i> )	LongReach Guardian <sup>Ⓞ</sup> ( <i>LPB0617</i> )
Correll <sup>Ⓞ</sup> ( <i>WI23322</i> )	Sentinel <sup>Ⓞ</sup> ( <i>W29, LR1075</i> )
Derrimut <sup>Ⓞ</sup> ( <i>NGSP005</i> )	Sunzell <sup>Ⓞ</sup> ( <i>SUN404B</i> )
EGA Burke <sup>Ⓞ</sup> ( <i>QT10984</i> )	Yenda <sup>Ⓞ</sup> ( <i>VN0870R</i> )
Gladius <sup>Ⓞ</sup> ( <i>RAC1262</i> )	Young <sup>Ⓞ</sup> ( <i>VQ0326</i> ) (also listed as AGT Young)

**Table 1. Summaries of recently released wheat varieties**

Variety	Test code	Breeder	Marketer	Comment
Barham	VO2697	AGT	Graintrust	An awnless, Aust Soft, mid-maturing variety targeting higher yielding regions, including irrigation.
Binnu	WAWHT2734	DAFWA	Crop Care Seed Technologies	Released in WA as a replacement for Arrino. ASW noodle variety.
Bolac	VQ2621	AGT	Graintrust	A mid to late maturing AH variety targeting higher yielding regions, including irrigation.
Bullaring	WA WHT 2589	DAFWA		A soft-grained club wheat for biscuit/cookie and steamed bread, comparable to Datatine and Tincurrin.
Carinya	SUN421T	Sunprime Seeds		A hard wheat for northern and southern NSW, with milling performance and suitability for yellow alkaline noodles comparable to Janz.
Catalina	LRPB0268	LongReach	AWB Seeds	An AH variety suited to medium rainfall regions.
Correll	WI23322	AGT	AGT Seeds	Mid season, AH (SA & Vic) replacement for Yitpi with better stem rust resistance.
Derrimut	NGSP005	Nugrain/AGT	Crop Care Seed Technologies	A potential AH variety With excellent rust and CCN resistance.
EGA Burke	QT10984	QDPI	PacSeeds	APH variety for Queensland and Northern NSW for early to mid sowings.
Guardian	LRPB0617	LongReach	AWB Seeds	Main season APW variety for medium to high rainfall regions.
Jandaroi				Durum wheat, short season, high yielding, triple rust resistance.
Sentinel	W29, LR1075	LongReach		Classed as AWB Standard White across NSW, Vic, SA and WA.
Sunzell	SUN404B	AGT	AGT Seeds	Early sow spring wheat suitable for Qld, NSW and Vic. APH (S NSW) and AH (N NSW and Vic).
Yenda	VN0870R	AGT	Graintrust	A mid to late maturing Aust Soft variety targeting higher yielding regions, including irrigation.
Young	VQ0326	AGT		Classified as AWB Hard in Vic, SA and NSW.

### RECENTLY RELEASED BARLEY VARIETIES

The following recent barley varieties (except the more recent Cowabbie and Dash) are also listed in the 2006 report of the Cereal Varieties Sub-Committee, published in the handbook of the RACI Cereal Chemistry Conference for 2006.

Buloke<sup>Ⓞ</sup> (VB105)

Cowabbie<sup>Ⓞ</sup> (WB236)

Dash<sup>Ⓞ</sup> (NFC902/909)

Fitzroy<sup>Ⓞ</sup> (VB9926)

Flagship<sup>Ⓞ</sup> (WI3408)

Fleet<sup>Ⓞ</sup> (WI3804)

GairdnerPlus<sup>Ⓞ</sup> (WI3586)

Grout<sup>Ⓞ</sup> (Cameo/Arupo 31-04)

Hindmarsh<sup>Ⓞ</sup> (VB0324)

Urambie<sup>Ⓞ</sup> (WB234)

Vertess<sup>Ⓞ</sup>

Vlamingh<sup>Ⓞ</sup> (WABAR2175)

Yarra<sup>Ⓞ</sup> (VB0021)

## QUALITY-RELATED GENES OF AUSTRALIAN WHEATS

The list of quality-related alleles in Appendix 2 provides information about a wide range of Australian wheat varieties that have been grown over many years. All allele designations are shown using the single-letter format (*a*, *b*, etc).

Various difficulties are inherent in providing lists of genes, particularly being certain of the authenticity of the source of the grain. Furthermore, polymorphisms may exist for a specific cultivar; that is, different grains of the same sample may show different composition. These individual variations may be due to contamination with foreign seed, thus providing wrong information. In such a case, the authenticity of the sample source should be examined.

On the other hand, it is likely that a variety may be genuinely represented by more than one genotype due to the presence of valid biotypes. Such biotypes may arise from the original cross that produced the variety under study, being sister lines that have not been segregated out in the process of selecting the cultivar. In such cases, the table indicates that alternative alleles have been detected, e.g., in the form “*a*, *b*”. Inevitably, for such a large set of data, there are omissions and cases of uncertainty; the latter are indicated by the addition of “?”.

### Glutenin subunits and dough quality

For the high-molecular-weight (HMW) glutenin alleles (*Glu-1*), Appendix 3 shows only the allele letter designations, but there is the alternative number designation for HMW glutenin subunits. Table 2 provides the equivalence between subunit numbers and allele letters (*a*, *b*, *c*, etc). No similar number designations are universally agreed for the low-molecular-weight (LMW) subunits of glutenin (*Glu-3* alleles) (Table 3). A full account of grain-quality proteins and the associated genes is provided in a book, published by AACC International, previously the American Association of Cereal Chemists (Wrigley et al., 2006), with the main accent on gliadin and glutenin proteins.

Despite the expansion of the list in Appendix 3 for glutenin alleles, it still does not include some early Australian varieties. Information about the gluten alleles for these is included in very extensive lists of wheat genotypes from around the world, provided on the AACC International web site ([www.aaccnet.org](http://www.aaccnet.org)).

Tables 2 and 3 indicate the relative rankings of the high-molecular-weight (HMW) and the low-molecular-weight (LMW) subunits of glutenin, with respect to dough strength (as *R*<sub>max</sub>, the height of the Extensograph curve). The rankings are based on analyses of Aroona isolines by Maria-Jane Appelbee and Geoff Cornish at SARDI, Adelaide.

**Table 2. Dough-strength rankings for HMW subunits of glutenin**

Allele designations (as lower-case letters) appear immediately after subunit numbers. Highest *R*<sub>max</sub> subunits appear at the top. Adapted from Vawser et al (2002). See also Cornish et al. (2006).

<i>Glu-A1</i>	<i>Glu-B1</i>	<i>Glu-D1</i>
1 <i>a</i>	7+8* <i>al</i>	5+10 <i>d</i>
3* <i>p</i>	17+18 <i>i</i>	
2* <i>b</i>	7+9 <i>c</i>	2+12 <i>a</i> ; 3+12 <i>b</i>
Null <i>c</i>	7+8 <i>b</i> ; 7*+8 <i>u</i> ; 13+16 <i>f</i>	2.2+12 <i>f</i>
	6+8 <i>d</i>	
	7 <i>a</i>	

**Table 3. Dough-strength rankings for LMW subunits of glutenin**

Highest Rmax at the top. Adapted from Vawser et al (2002). See also Cornish et al. (2006).

<i>Glu-A3</i>	<i>Glu-B3</i>	<i>Glu-D3</i>
<i>d</i>	<i>b; d; g; m</i>	<i>d; f</i>
<i>b</i>	<i>h</i>	<i>e</i>
<i>c</i>	<i>a</i>	<i>a; c; b</i>
<i>f</i>	<i>c</i>	
<i>a</i>		
<i>e</i>		

In certain varieties, HMW glutenin subunit 7 has been recognised as been over-expressed. In this case, it is shown in Table 2 in bold type, underlined. Its greater quantity makes a significant difference in its contribution to dough strength. It is thus important to recognise the over-expressed version of subunit 7. This over-expressed 7 can be usually be distinguished from normal expression of band 7 using SDS-PAGE when run alongside reference varieties. PCR techniques are used in breeding programs to screen progeny where an over-expressing 7 parent has been used. RP-HPLC and the Lab-on-a-chip system are valuable in quantifying the band/peak representing subunit 7, and thus detecting over-expressed version of it (Vawser and Cornish, 2004; Uthayakumaran et al., 2005).

#### **Starch properties and the waxy genes**

Important information about the suitability of wheat varieties for the manufacture of white-salted noodles (udon) is indicated by the presence or absence of the gene *Wx-B1* for the granule-bound starch synthase enzymes (GBSS). The synthesis of amylase by GBSS1 is determined by the presence (or absence) of three complementary alleles on chromosomes 7AS, 4AL and 7DS. Many Australian varieties are 'null' for the second of these, giving them advantages in their starch properties for noodle production. This characteristic has been referred to as the 'Null-4A' gene, or more correctly, the '*Wx-B1b*' allele; the presence of this gene being '*Wx-B1a*'. This characteristic is listed for many varieties in Appendix 2.

#### **The serpins and dough quality**

The serpins (serine protease inhibitors) are a recently studied class of water-soluble proteins present in flour that we now realise contribute to dough properties. Their presence (allele *a*) (or absence, the null allele *b*) is also proving to be valuable for distinction between varieties for the purposes of variety identification. Appendix 2 lists the allele status of three allelic forms of the serpins, namely, the 1a, 3a and 3b isoforms. It is expected that the presence of 1a would contribute positively to dough properties, especially for strength, extensibility and mixing time to peak resistance. The serpin 1a gene is located on chromosome 5B, while the 3a/b alleles are controlled by a gene located on chromosome 7D (Skylas, 2001).

The allele designations are also provided for an isoform of beta-amylase, which often appears co-polymerised with glutenin protein. The relationship of this beta-amylase protein with quality is not yet understood, but it is a useful marker of genotype for variety identification.

#### **REFERENCES**

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**Appendix 1. Grade acceptances and preferred varieties for the 2007/08 harvest**  
Including premium payments recommended for "Premium Choice Varieties"

Variety	Queensland	Northern NSW	Central NSW	Southern NSW	Victoria	South Australia	Western Australia
AGT Scythe*					Acceptable AH	Acceptable APW	Acceptable APW
Annuello							Preferred ASWN\$14
Arrino		Marginal APDR					
Arrivato*			Acceptable APH	Acceptable APH			
Babblers*			Marginal APH				
Batavia	Marginal APH						
Baxter*	Acceptable APH	Acceptable APH					
Bullaring*							Preferred ASFT
Cadoux							Preferred ASWN\$14
Calingiri							Acceptable ASWN
Carinya*		Acceptable AH	Acceptable AH	Acceptable AH			
Carnamah*							Marginal AH
Chara*			Acceptable APH	Preferred APH	Preferred AH		
Clearfield JNZ*				Acceptable AH	Acceptable APH	Acceptable AH	
Condor							
Correll*							
Cunningham	Marginal APH			Marginal APH		Acceptable AH	
Diamondbird		Marginal AH	Marginal AH	Marginal AH	Marginal AH		
Dollarbird				Marginal AH			
Drysdale*			Marginal AH	Marginal AH	Marginal APW		
EAG 2248*							Preferred ASFT
EGA Bellaroi*	Preferred APDR	Preferred APDR	Preferred APDR	Preferred APDR		Preferred APDR	Preferred APDR
EGA CastleRock*							Preferred AH \$5
EGA EagleRock*							Acceptable AH
EGA Gregory*	Preferred APH	Preferred APH	Preferred AH	Preferred AH			Preferred AH
EGA Hume*	Preferred APH \$5						
EGA Jitarning*							Preferred ASFT
EGA Wedgetail*			Acceptable AH				
EGA Wylie	Acceptable APH	Acceptable AH		Marginal APH			
EGABonnieRock*							Preferred AH \$5
EGAWentworth*						Acceptable APW	Acceptable APW
Ellison*	Acceptable APH	Acceptable APH	Acceptable APH	Acceptable APH			





Ventura*	Acceptable AH	Acceptable AH	Acceptable AH	Acceptable AH	Acceptable APW	Preferred APW/APWT
Westonia*						
Wollaroi*		Preferred APDR				
Wyalkatchem*				Preferred APW	Preferred APW	Preferred APW
Wylah*			Acceptable AH			
Yitpi*				Preferred AH	Preferred AH	Acceptable AH
Young*			Acceptable AH	Acceptable AH	Acceptable AH	

**(Adapted from “Wheat Variety Guide 2007-08 Season”, a booklet published by AWB National Pool, Melbourne.)**

This listing should serve as a general guide to variety preferences, but further advice should be obtained before making decisions e.g. about sowing or buying. Grade acceptability depends on other factors too, such as protein content.

\* Variety accepted under Plant Breeders’ Rights in Australia.

Abbreviations: APH = Australian Prime Hard. AH = Australian Hard. APW = Australian Premium White. ASWN = Noodle grade.

**Premium Choice Varieties are shown by the pay-out \$ after some “Preferred” designations.**

Appendix 2. Quality-related attributes and genes for Australian wheats

Wheat variety	Hardness	Wx-BI (GBSS)	Glu-A1	Glu-B1	Glu-D1	Glu-A3	Glu-B3	Glu-D3	Serpin 1a	New Serpin 3a	New Serpin 3b	Beta-amylase, fast isoform	PPO	Origin
AGT Scythe	H		b	i, u, ol	a	b	b	a	a	a	b	b		AGT (SA)
AGT Young	H		a	u	d	c	h	b	a	b	a	b	M	AGT (Vic)
Ajana	S	a	b	i	a	b	h	b	a	b	a	b		WADA
Amery	H	a	b	i	c	b	b	b	a	b	a	b	L	WADA
Angas	H	b	b	u	a	c	g	c	a	a	b	a		SA
Anlace	S	b	a	c	a	c	g	c	a	a	b	b		SA
Annuello	H	a	a	u	a	b	b	b	a	a	b	b		Vic
Arnhem	H	b	a	i	a	b	d	b	a	b	a	b		QDPI
Aroona	H	b	a	c, u	a	b	b	b	a	b	a	b		UA, Waite (SA)
Arrino	S	b	b	i	a	c	b	c	a	b	a	a		WADA
Arrivato	Durum		b	d		?	?		a	b	b	b		NZ (Crop & Food)
Babbler	H	a	b	i	a	b	b	c	a	a	b	b	L	NSWAg
Banks	H	a	b	u	a	b	b	c	a	a	b	b		QDPI
Barham	S		a	c	a	c	b	c	a	a	b	b		AGT (Vic)
Barunga	H	b	a	u	d	c	b	c	a	a	b	b	L	SA
Batavia	H	b	a	u	a	c	b	c	a	a	b	a	M	QDPI
Baxter	H	a	a	f	a	b	h	a	a	a	b	b		QDPI AUS 27694
Bellaroi	Durum	a	c	u	-	c	a	-	a	a	a	a		AUS 99277
Beulah	H	a	b	u	a	c	b	b	a	a	b	b		Vic
Binnu														
Blade	H	b	b	i	a	b	b	b	b	b	a	b	M	SA
Bokal	H		b	i	a	e	b	b	b	a	b	b		WADA
Bolac	H		b, a	i	a, d	b	b	a	a	a	b	b		AGT (Vic)
Bowerbird	H	a	a	i	a	b	h	b	a	b	a	b		NSWAg
Bowie	S	b	a	c	a	b, c	b	c	a	a	b	b		SA
Braewood	H	a	a	u	a	c	b	b	a	a	b	b		VAWCRC
Brennan	Feed	a	c	d	d	b	g	c	a	a	b	b		QDPI
Brookton	H	a	b	i	a	c	h	a	a	a	b	b	H	WADA
BT-Schomburgk	H	b	a	c, u	a, d	c	b	c	a	a	b	b	M	SA







Matong	S	a	a	d	f?	g	b	b	a	b	b	a	b	b	AUS 21821
Mawson	Feed/Hay	a	a	d	e	j	c	a	a	a	a	a	a	a	QDPI
Meering	H	a	a	a	b	b	b	a	b	a	b	b	b	b	Vic AUS 22606
Minto	H	a	a	a	b	b	b	a	a	a	a	b	b	b	VIDA (Vic)
Mira	H	a	a	a	b	b	b	a	a	a	a	b	b	b	Vic
Mitre	H	a	a	a	b	b	b	a	a	a	a	b	b	b	Vic
Moray	H	a	a	a	c	b	b	a	a	a	a	b	b	b	VIDA (Vic)
Mulgara	H	a	a	a	b	b	b	a	a	a	a	b	b	b	NSWAg
Nyabing	H	b	a	d	d	b, h	b, c	a	a	a	a	b	b	b	WADA AUS 29491
Olympic	S	a	a, b	d	e	b	a	b	b	a	b	b	b	b	VIDA (Vic)
Ouyen	H	a	b	d	e	b	a	b	b	a	b	b	b	b	Vic
Oxley	H	a	b	a	c	b	b	a	a	a	b	b	b	b	AUS 22110
Pardalote	H	a	a	a	b	b	b	a	a	a	a	b	b	b	NSWAg AUS30030
Pelsart	H	a	a	a	b	b	b	a	a	a	a	b	b	b	QDPI
Perenjori	H	b	a	a, c	d	b	a	b	a	b	a	a	b	b	WADA
Perouse	H	a	b	a	b	b	a	a	b	a	b	b	b	b	QDPI
Petrie	H	a	a	a	b	b	b	a	a	a	a	b	b	b	QDPI
Pugsley	H	a	a	a	c, u	h	c	a	a	a	a	b	b	b	SA (UA)
QAL2000	S	b	a	a	f	b	a	b	b	a	a	b	b	b	VAWCRC (Narrabri)
QALBis	S	b	a	a	f	b	c	a	a	a	a	b	b	b	VAWCRC (Narrabri)
QALClub	S	a	a	a	f	b	c	a	a	a	a	b	b	b	VAWCRC (Narrabri)
QALClub	S	a	a	a	f	b	c	a	a	a	a	b	b	b	VAWCRC (Narrabri)
2000-15	S	a	a	a	f	b	c	a	a	a	a	b	b	b	VAWCRC (Narrabri)
Rees	H	b	b	d	b	h	b	a	b	a	a	b	b	b	Aus99288
Rosella	S	b	b	a	b	b	b	a	b	a	b	b	b	b	NSWAg
Rowan	H	b	a	d	c	h	b	b	a	b	a	a	a	a	QDPI
Rudd	Feed	a	c	b	c	g	b	a	a	a	a	b	b	b	CSIRO
Sabre	H	a	c	a	e	j	c	a	a	a	a	b	b	b	UA, RAC (SA)
Sapphire	H	a	a	a	b	b	b	a	a	a	a	b	b	b	Challenge Seeds(NZ)
Schomburgk	H	b	a	a, d	c	b	c	a	a	a	a	b	b	b	UA, Waite (SA)
Senninel	H	b	a	a, d	b, c	h	b	b	a	a	a	b	b	b	Vic
Silverstar	H	b	a	a, d	b, c	h	b	b	a	a	a	b	b	b	NSWAg
Snipe	S	a	c	a	c	b	b	a	a	a	a	b	b	b	SA AUS 25923
Stiletto	H	b	a	d	c	h	c	a	a	a	a	b	b	b	NSWAg AUS 25597
Stretton	H	a	b	a	c	b	c	b	b	a	a	a	a	a	QDPI AUS 30026
Strzelecki	H	b	a	a	c	b	c	a	a	a	a	b	b	b	Sunprime(Narrabri)
Sunbri	H	a	a	a	b	b	b	a	a	a	a	a	a	a	Sunprime(Narrabri)

Sunbrook	H	b	a	i	d	b, d	h	b	a	a	a	a	b	b	H	Sunprime(Narrabri)
Sunco	H	a	a	u	a	b	b	b	a	a	a	a	b	b	L	Sunprime(Narrabri)
Suneca	H	a	a	i	d	d	h	b	a	a	a	b	a	a		Sunprime(Narrabri)
Sunelg	H	b	a	i	a	c	b	b	b	a	a	b	b	b	M	Sunprime(Narrabri)
Sunland	H	a	a	u	a	c	b	b	a	a	a	b	b	b	M	Sunprime(Narrabri)
Sunlin	H	b	a	i	a	d	b	b	a	a	a	b	b	a	M-H	Sunprime(Narrabri)
Sunmist	H	a	a	u	a	b	b	b	a	a	a	b	b	b		Sunprime(Narrabri)
Sunsoft	S	b	a	u	a	b	b	b	a	a	a	b	b	b		Sunprime(Narrabri)
Sunstar	H	a	a	u	d	b	b	b	a	a	a	b	b	b		Sunprime(Narrabri)
Sunstate	H	b	a	i	d	b	h	b	a	b	a	a	a	b	H	Sunprime(Narrabri)
Sunvale	H	a	a	u	a	b	b	b	a	a	a	b	b	b	H	Sunprime(Narrabri)
Sunzell	H	a	a	i	d	b	h	b	a	a	a	b	b	b		AGT (Narrabri)
SW Odiel	H	a	a	c	d	b	f	b	a	a	a	b	b	b		NSWAg
Swift	H	a	a	u	a	b	b	b	a	a	a	a	a	a		NSWAg AUS 27190
Tailorbird	H	b	a	i	d	b	h	b	a	a	a	b	b	b		(NSWAg)Tamworth
Tamaroi	Durum	a	c	d	-	c	a	-	a	a	a	b	b	b		WADA
Tamarin	H		b	c	c	b	b	b	a	a	a	b	b	b		WADA
Rock	S	b	b	i	a	c	b	b	a	a	a	a	a	a		QDPI AUS 25557
Tammin	S	a	a	u	d	b	d	a	a	a	a	b	b	b		SA
Tasman	H	a	a	u	a	c	b	a	a	a	a	a	a	a		CSIRO
Tatiara	S	b	a	c	a	c	b	c	a	a	a	b	b	b		NSWAg
Tennant	Feed	a	a	d	a	d	j, b	b	a	a	a	a	a	a		WADA
Thornbill	S	b	b	c	a	c, f?	b	a	a	a	a	b	b	b		SA
Tincurrin	S	a	a	u	a	f	d	a	a	a	a	b	b	b		NSWAg
Trident	H	b	a	c	d	e	h	c	a	a	a	b	b	b		UA Waite, VIDA
Triller	S	a	a	u	a	b	j	b	a	a	a	b	b	b		SUN (NSW)
Vectis	S	b	a	b	a	c	b	a	a	a	a	a	a	a		NSWAg AUS 23018
Ventura	H	b	a	i	d	c	h	b	a	a	a	b	b	b		SA
Warbler	Feed	a	a	u	a	b	j	b	a	a	a	b	b	b		WADA(Withdrawn)
Ward's	S	b	a	h	d	f	f	b	a	a	a	b	b	b		WADA
Prolific	S			i	a	c	b	c	a	a	a	b	b	b	M	NSWAg AUS 28278
Wellstead	S	b	b	i	a	c	h	c	a	a	a	b	b	b		WADA
Westonia	H	a	a	u	a	c	b	b	a	a	a	b	b	b		NSWAg AUS 28278
Whistler	H	a	a	u	a	c	b	b	a	a	a	b	b	b		WADA
Wilgoyne	H	a	a	i	d	d	h	b	a	a	a	b	b	a		





### **Appendix 3. Profiles of varieties released during the past two years**

(One variety per page)

Barham<sup>®</sup> (*VO2697R*)  
Binnu<sup>®</sup> (*WAWHT2734*)  
Bolac<sup>®</sup> (*VQ2621*)  
Bullaring<sup>®</sup> (WA WHT3 2589)  
Carinya<sup>®</sup> (SUN421T)  
Correll<sup>®</sup> (WI23322)  
Derrimut<sup>®</sup> (*NGSP005*)  
EGA Burke<sup>®</sup> (*QT10984*)  
Gladius<sup>®</sup> (*RAC1262*)  
Jandaroi<sup>®</sup> (*Line E*)  
LongReach Catalina<sup>®</sup> (*LPB0268*)  
LongReach Crusader<sup>®</sup> (*LPB03-1073*)  
LongReach Dakota<sup>®</sup> (*LPB0780*)  
LongReach Guardian<sup>®</sup> (*LPB0617*)  
Sentinel<sup>®</sup> (W29, LR1075)  
Sunzell<sup>®</sup> (*SUN404B*)  
Yenda<sup>®</sup> (*VN0870R*)  
Young<sup>®</sup> (VQ0326) (also listed as AGT Young)

## Barham<sup>®</sup> (VO2697R)

Pedigree Bowie//Bersec/3\*Bindawarra126937///Bowie  
 Bred & Selected by Victorian Dept. of Primary Industries and evaluated prior to release by Australian Grain Technologies  
 Released by Australian Grain Technologies

### Quality Characteristics

Barham is a soft-grained wheat, that has similar physical grain characteristics to Bowie and Rosella. The combination of flour yield and purity information has ranked Barham equivalent or slightly below Bowie in milling performance. Flour yellow pigment levels of Barham are slightly higher than Bowie.

The water absorption level of Barham is low compared with Bowie, linked to its softer grain properties. Barham also has a short development time. Extensograph and alveograph results indicate Barham to have weaker but more extensible dough compared with Bowie. The paste viscosity properties of Barham are similar to Bowie, and in some comparisons have been higher.

The cookie performance of Barham is satisfactory based on higher cookie ratio and spread values compared with Bowie. In limited steamed bread assessments Barham was superior to Bowie.

On available quality data, Barham was accepted by the domestic flour milling industry as a SOFT variety, and was also awarded a SOFT classification by the AWBI classification panel for export.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extrac Rate	Flour Ash	Colour Gradc	Minolta		Visco	Farinograph			Extensograph (45min)	
								Flour			Pcak	WA	DDT	Stab	Extens
	(kg/hl)	(g)	(Nx5.7 11%mb)	(%)	(%) (14%mb)	(KJ)	L	b	(BU)	(%)					
<b>Barham</b>	<b>78.5</b>	<b>37.2</b>	<b>8.7</b>	<b>30</b>	<b>73.1</b>	<b>0.49</b>	<b>-2.3</b>	<b>94.3</b>	<b>9.4</b>	<b>560</b>	<b>54.3</b>	<b>1.5</b>	<b>1.9</b>	<b>15.5</b>	<b>150</b>
Bowie	78.5	36.8	8.7	26	74.6	0.43	-2.4	94.6	8.6	440	57.8	1.4	1.6	12.9	195

Source: AGT 2003/04 Victorian trials, quality results from Agrifood Technology

End Products	Barham	Bowie
<i>Cookie Test</i>		
Cookie Ratio	<b>6.1</b>	<b>5.3</b>
Cookie Spread	<b>7.6</b>	<b>7.2</b>
<i>Steamed Bread</i>		
Total Score (100)	<b>63.0</b>	<b>60.1</b>

Source: AGT 2003/04 Victorian trials, quality results from Agrifood Technology

## Binnu<sup>φ</sup> (WAWHT2734)

Pedigree Arrino/(Y89-4034)Eradu\*4.VPM1  
 Bred & Selected by Robin Wilson and the Department of Agriculture and Food Western Australia's wheat breeding team  
 Released by Department of Agriculture and Food, Western Australia

### Quality Characteristics

Based on assessment of samples grown in Western Australia, Binnu has acceptable physical quality, but slightly smaller grain size than the noodle varieties Arrino, Cadoux and Calingiri. Binnu has shown greater susceptibility to black point compared with the noodle varieties. Wholemcal flour swelling volume results are excellent, with Binnu recording higher levels than the noodle control varieties. Viscograph measurements support the paste viscosity ranking of Binnu compared with the noodle varieties.

The straight run milling performance of Binnu is good, with only Calingiri, the best milling noodle variety, being better. At patent extraction levels, flour ash levels were low. The flour colour of Binnu is good, being similar to Arrino and the target colour of Cadoux. The water absorption level of Binnu is slightly below Cadoux, but similar to Arrino and this may be due to Binnu having slightly softer grain-hardness characteristics. The dough properties of this variety are comparable with Arrino and Cadoux.

Udon noodle assessments of Binnu have ranked this variety as having similar brightness levels to Arrino, of a more creamy appearance. Sensory evaluation ranked Binnu equivalent to Arrino and Cadoux, and superior to Calingiri.

Binnu has an ASWN classification for Western Australia.

Variety	Test Weight (kg/hl)	Wheat Protein (Nx5.7 11%mb)	PSI	Extract Rate (%)	Flour Ash (% (14%mb)	Agtron R546 (%)	Minolta		FSV (ml/g)	Farinograph			Extensograph (45min)	
							Flour			WA (%)	DDT (min)	Bdown (BU)	Extens (cm)	Max Height (BU)
							L	b						
<b>Binnu</b>	<b>80.8</b>	<b>10.0</b>	<b>32</b>	<b>60</b>	<b>0.37</b>	<b>85.0</b>	<b>93.3</b>	<b>9.5</b>	<b>21.8</b>	<b>51.4</b>	<b>1.5</b>	<b>35</b>	<b>16.8</b>	<b>437</b>
Arrino	81.1	10.4	30	60	0.40	84.7	93.2	9.1	19.9	51.4	1.5	42	16.5	440
Cadoux	80.5	10.5	29	60	0.38	84.4	93.3	9.6	20.5	53.8	1.5	43	17.4	385
Calingiri	82.0	10.3	31	60	0.40	86.1	93.4	8.2	20.2	52.6	2.4	37	16.4	400

Source: DAFWA 2003 and 2004 trials, quality results from DAFWA

End Products	Binnu	Arrino	Cadoux	Calingiri
<i>Udon Noodle</i>				
Minolta L (0hrs)	<b>85.4</b>	85.5	85.0	86.1
Minolta b (0hrs)	<b>25.4</b>	25.0	26.9	21.4
Minolta L (24hrs)	<b>82.6</b>	82.5	81.7	82.4
Minolta b (24hrs)	<b>28.4</b>	27.2	29.7	25.6
Median Sensory Rating – Total	<b>69.7</b>	69.6	68.7	68.6

Source: DAFWA 2003 trials, quality results from DAFWA

**Bolac<sup>®</sup> (VQ2621)**

Pedigree Nesser/2\*V1252  
 Bred & Selected by Victorian Dept. of Primary Industries and evaluated prior to release by Australian Grain Technologies.  
 Released by Australian Grain Technologies

**Quality Characteristics**

In comparisons with the long-seasoned APW variety Kellalac in Victoria, the physical characteristics of Bolac are comparable. The milling performance of Bolac is considered good, having low flour ash and extraction rate levels 1-2% higher than Kellalac. Flour colour is acceptable, with Minolta b\* values being lower than Kellalac. The paste viscosity attributes of Bolac are appropriate for a hard-grained variety.

In comparisons with Kellalac, the water absorption level of Bolac has been higher, and dough development time, and stability longer. Extensograph results indicate Bolac to have strong and balanced dough properties. In bake tests using the rapid, straight, and sponge and dough methods, the performance of Bolac has been superior to Kellalac. Yellow alkaline noodle quality was marred by poor colour stability.

On the basis of available quality data for Victoria, Bolac was awarded an AH classification.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)	
	(kg/hl)	(g)	(Nx5.7 11%mb)		(%)	(%)(14%mb)	(KJ)	Flour		Peak (BU)	WA (%)	DDT (min)	Stab (min)	Extens (cm)	Max Height (BU)
								L	b						
<b>Bolac</b>	<b>80.6</b>	<b>33.6</b>	<b>12.0</b>	<b>15</b>	<b>76.6</b>	<b>0.41</b>	<b>-1.7</b>	<b>92.8</b>	<b>9.0</b>	<b>250</b>	<b>63.0</b>	<b>5.5</b>	<b>7.0</b>	<b>20.7</b>	<b>370</b>
Kellalac	77.6	32.4	12.5	16	74.2	0.42	-1.4	92.9	10.3	290	58.6	3.4	2.9	21.3	255

Source: AGT Vic 2004/05 Early season trials, quality results from Agrifood Technology

End Products	Bolac	Kellalac
<i>Pan Bread – Rapid</i>		
Average Volume (cc)	<b>1420</b>	1225
Total Score (100)	<b>82.5</b>	64.3
<i>Pan Bread – Straight Dough</i>		
Average Volume (cc)	<b>900</b>	860
Total Score (100)	<b>78.5</b>	69.6
<i>Arabic Bread</i>		
Total Score (100)	<b>70.0</b>	78.0
<i>Yellow Alkaline Noodles</i>		
Minolta L (24hrs)	<b>71.5</b>	75.1
Minolta b (24hrs)	<b>27.5</b>	30.8
△ Minolta L (24hrs)	<b>10.5</b>	7.2

Source: AGT Vic 2004/05 Early season trials, quality results from Agrifood Technology

## Bullaring<sup>ϕ</sup> (WAWHT2589)

Pedigree Tincurrin\*2//Gamenya/lassul(77Z:893)/3/Datatine  
 Bred & Selected by Robyn McLean and the WA wheat breeding team.  
 Released by Department of Agriculture and Food Western Australia

### Quality Characteristics

Bullaring, a soft-grained club wheat, has been evaluated over several seasons in Western Australia, and long-term averages indicate it has higher test weight, and thousand kernel weight results higher compared to control varieties except EGA Jitarning. It has very good milling performance, with superior extraction rates and a low level of flour impurities. The resultant flour has low levels of yellow pigment based on Minolta b\* values. The flour and starch pasting attributes of Bullaring are appropriate for a soft-grained wheat.

Farinograph testing has shown that Bullaring has higher-than-desirable water absorption. Extensograph measurements indicate weak and moderately extensible dough properties.

Biscuit and cookie testing produced favourable results for Bullaring, with results similar to current soft varieties. Steamed bread results for Bullaring were also positive, and are comparable to both Datatine and Tincurrin.

Bullaring has been classified as AWB Soft in Western Australia.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)	
								Flour			Peak	WA	DDT	Stab	Extens
								L	b	(BU)					
<b>Bullaring</b>	<b>80.0</b>	<b>38.2</b>	<b>7.9</b>	<b>16</b>	<b>71.4</b>	<b>0.40</b>	<b>-4.9</b>	<b>94.7</b>	<b>8.0</b>	<b>350</b>	<b>54.0</b>	<b>1.7</b>	<b>2.4</b>	<b>15.2</b>	<b>195</b>
Tincurrin	79.0	35.8	7.8	20	70.4	0.40	-4.5	93.2	8.1	370	52.1	1.8	2.2	14.1	170
Datatine	81.0	35.4	7.9	20	71.0	0.44	-4.6	94.6	8.1	430	51.9	1.5	1.9	14.4	185

Source: DAFWA 2004/05 trials, quality results from Agrifood Technology

End Products	<b>Bullaring</b>	Tincurrin	Datatine
<i>Cookie Test</i>			
Cookie Ratio	<b>6.4</b>	6.5	6.4
Cookie Spread	<b>7.7</b>	7.8	7.6
<i>Steamed Bread</i>			
Total Score (100)	<b>74.0</b>	72.7	73.5

Source: DAFWA 2004/05 trials, quality results from Agrifood Technology

## Carinya<sup>®</sup> (SUN421T)

Pedigree Janz\*4/Sunvale  
 Bred & Selected by University of Sydney Plant Breeding Institute Narrabri and Cobbitty  
 Released by Sunprime Seeds

### Quality Characteristics

Carinya, based on northern and southern NSW comparisons has displayed good grain properties and comparable milling performance to Janz. Minolta flour colour tests were both bright and white. Carinya has below-average to average flour pasting attributes and this is consistent with Janz.

Grain hardness and water absorption levels are very good and comparable to control varieties. Dough rheology tests indicate Carinya has strong and balanced dough properties.

Yellow alkaline noodle results indicate that the performance of Carinya was average, with the overall performance similar to Janz. The bake results of Carinya have varied depending upon the method. In rapid bake tests it was considered superior to control varieties, but straight dough baking results were inferior to controls.

Carinya has been classified as AWB Hard in New South Wales.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		RVA	Farinograph			Extensograph (45min)	
								Flour		Peak	WA	DDT	Stab	Extens	Max Height
	(kg/hl)	(g)	(Nx5.7 11%mb)	(%)	(%) (14%mb)	(KJ)	L	b	(RVU)	(%)	(min)	(min)	(cm)	(BU)	
<b>Carinya</b>	<b>79.9</b>	<b>32.2</b>	<b>13.2</b>	<b>12</b>	<b>77.8</b>	<b>0.53</b>	<b>-1.5</b>	<b>91.8</b>	<b>9.4</b>	<b>300</b>	<b>61.3</b>	<b>7.4</b>	<b>10.7</b>	<b>23.8</b>	<b>390</b>
Janz	80.2	32.7	12.9	15	78.0	0.52	-1.0	91.8	9.4	303	59.2	7.0	11.2	24.0	430
Sunco	80.6	31.4	13.3	14	76.4	0.56	-0.5	91.4	9.4	327	60.0	6.8	7.1	23.8	460

Source: SunPrime NNSW 2003/04 trials, quality results from quality results from BRI Australia through NWQTP testing

End Products	Carinya	Janz	Sunco
<i>Pan Bread – Rapid</i>			
Average Volume (cc)	<b>847.5</b>	820.0	847.5
Total Score (100)	<b>70</b>	66	66
<i>Pan Bread – Fermented</i>			
Average Volume (cc)	<b>707.5</b>	710.0	707.5
Total Score (100)	<b>58</b>	58	58
<i>Pan Bread – Sponge and Dough</i>			
Average Volume (cc)	<b>1007.5</b>	1000.0	952.2
Total Score (100)	<b>58</b>	63	54
<i>Yellow Alkaline Noodles</i>			
Minolta L (1/2hr)	<b>77.7</b>	78.2	77.8
Minolta b (1/2hrs)	<b>27.9</b>	26.9	29.3
△ Minolta L (24hrs)	<b>8.8</b>	8.8	5.9

Source: SunPrime NNSW 2003/04 trials, quality results from BRI Australia through NWQTP testing

## Correll<sup>®</sup> (W123322)

Pedigree Derived from a cross between Yitpi and RAC875  
 Bred & Selected by A.Rathjen and D.Cooper (UA), selection and commercial release by A.Barr and AGT wheat breeding team.  
 Released by Australian Grain Technologies

### Quality Characteristics

Based on South Australian trials Correll is a high protein accumulating variety, with grain size and screenings losses superior to Janz and Krichauff. Its test weight, though, can be low. Correll's milling performance is less than desirable when extraction rates and flour purity measurements are considered. Minolta test have shown the flour colour to be "creamy" and identical to Yitpi. Correll has very good flour pasting properties.

Farinograph results show Correll has acceptable water absorption, comparable to Janz and Yitpi, though the level is inferior to Frame. Farinograph dough development and stability times are longer than controls it has been compared against. Extensograph data suggests the dough properties are strong and balanced, being superior to all controls.

In rapid, straight, and sponge and dough bake tests Correll performed at a level either equivalent or superior to control varieties. Yellow alkaline noodle evaluation produced acceptable noodle sheet colour and colour stability.

Correll has been classified as AWB Hard in South Australia.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		RVA	Farinograph			Extensograph (45min)	
								Flour			Peak	WA	DDT	Stab	Extens
								L	b	(RVU)					
Correll	78.2	33.8	13.4	13	77.7	0.62	-0.6	92.1	10.7	345	62.8	5.9	15.7	26.0	405
Yitpi	82.8	34.5	12.7	13	77.9	0.57	-1.4	92.0	10.5	345	63.0	5.3	7.5	22.5	325
Frame	84.4	35.9	12.8	13	77.8	0.56	-1.7	92.5	11.3	349	63.7	5.1	6.7	21.8	285
Janz	81.0	27.6	12.6	13	77.1	0.57	-1.5	92.0	9.5	356	62.2	5.8	10.8	24.0	305

Source: AGT 2004/05 trials, quality results from BRI Australia through NWQTP testing

End Products	Correll	Yitpi	Frame	Janz
<i>Pan Bread – Rapid</i>				
Average Volume (cc)	822.5	775	832.5	817.5
Total Score (100)	65	58	66	65
<i>Pan Bread – Fermented</i>				
Average Volume (cc)	800	695	737.5	665
Total Score (100)	54	48	53	44
<i>Yellow Alkaline Noodles</i>				
Minolta L (1/2hr)	77.7	79.1	79.1	78.9
Minolta b (1/2hrs)	32.1	30.1	30.9	30.8
△ Minolta L (24hrs)	9.7	10.5	10.5	9.5

Source: AGT 2004/05 trials, quality results from BRI Australia through NWQTP testing

## Derrimut<sup>®</sup> (NGSP005)

Pedigree VN150/VN715  
 Bred & Selected by Gururaj Kadkol in collaboration with Sunprime, now part of Australian Grain Technologies.  
 Released by Nuseed Pty. Ltd.

### Quality Characteristics

Testing of samples grown in Victorian and South Australian trials has shown the physical quality of Derrimut to be good, noting that it has smaller grain size than 'large grain varieties' like Frame and Yitpi. The protein level of Derrimut has tended to be lower than test controls.

The milling performance of Derrimut appears good, exceeding both Janz and Yitpi in terms of flour yield and purity adjusted milling levels. The flour colour of Derrimut is acceptable, and similar to Yitpi. Paste viscosity measurements indicate Derrimut is average for this trait, comparable with Janz. Overall, farinograph measurements of Derrimut have shown it to be very similar to Janz. Derrimut has adequate dough strength and extensibility.

The yellow alkaline noodle performance of Derrimut is considered average to poor, owing to poor colour and colour stability attributes. In rapid and straight dough baking tests Derrimut has performed very well, and is comparable to Janz and Yitpi both of which are regarded as having good baking quality.

Derrimut has been awarded an AH classification in Victoria and South Australia.

Variety	Test Wt (kg/hl)	1000 Kernel Weight (g)	Wheat Protein (Nx5.7 11%mb)	Extrac Rate (%)	Colour Grade (KJ)	Minolta		Farinograph			Extensograph (45min)	
						Flour		WA	DDT	Stab	Extens	Max Height
						L	b	(%)	(min)	(min)	(cm)	(BU)
Derrimut	83	32.4	12.7	74.3	-2.1	90.2	10.1	62.8	5.0	11.0	20.4	400
Yitpi	81	39.2	13.7	72.7	-2.2	90.8	9.8	64.0	9.6	>16	22.7	472
Janz	81	31.0	13.7	72.2	-2.1	89.6	9.0	64.8	6.5	>16	23.0	444
Frame	82	40.0	14.1	71.9	-2.0	90.5	11.2	67.0	5.0	11.6	21.6	346

Source: Nugrain Victorian 2006/07 trials, quality results from DPI Victoria

End Products	Derrimut	Yitpi	Janz	Frame
<i>Pan Bread – Straight</i>				
Average Volume (cc)	995	925	1005	900
Total Score (100)	87.6	85.7	90.6	82.8
<i>Pan Bread – Rapid</i>				
Average Volume (cc)	1350	1400	1370	1600
Total Score (100)	64.8	66.5	67.3	78.8
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	65.0	62.8	62.6	64.7
Minolta b (24hrs)	24.3	25.2	23.6	23.3
△ Minolta L (24hrs)	14.7	15.7	16.8	14.4

Source: Nugrain Victorian 2005/06 trials, quality results from Agrifood Technology



## EGA Burke<sup>®</sup> (QT10984)

Pedigree	Sunco/2*Hartog
Bred & Selected by	Queensland Department of Primary Industries & Fisheries (DPI&F) with the Enterprise Grains Australia (EGA) joint venture
Released by	Enterprise Grains Australia

### Quality Characteristics

Results from Queensland trials have shown that EGA Burke has similar physical quality to varieties like Baxter, Sunco and Sunvale. However, the protein accumulation of EGA Burke has been lower than such control varieties. The overall milling performance of EGA Burke is good, comparable to Sunco and Sunvale when purity adjustments are made to flour yield. The flour colour of EGA Burke is acceptable, based on Minolta b\* measurements. EGA Burke has higher yellow pigment levels than Baxter and Sunvale.

The high starch damage and diastatic activity levels of EGA Burke have been associated with low grain hardness measurements. However, water absorption levels have only being slightly higher than Baxter and similar to Sunco and Sunvale. Extensograph results indicated EGA Burke to be strong and slightly inextensible. EGA Burke has above average paste viscosity attributes.

EGA Burke has performed very well in yellow alkaline noodle tests. A consistent observation from laboratories assessing this variety has been good yellow colour development. Generally, the baking performance (rapid, straight dough, and sponge and dough) of EGA Burke has been acceptable, though some inferior performances have linked to its low protein achievement.

The assessment of available quality data for Queensland resulted in EGA Burke been awarded an APH classification.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extrac Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)		
								Flour			Peak	WA	DDT	Stab	Extens	Max Height
								L	b							
<b>EGA Burke</b>	<b>82.0</b>	<b>39.3</b>	<b>13.5</b>	<b>10</b>	<b>75.8</b>	<b>0.46</b>	<b>-2.6</b>	<b>92.7</b>	<b>10.3</b>	<b>780</b>	<b>62.8</b>	<b>6.0</b>	<b>7.9</b>	<b>20.6</b>	<b>370</b>	
Sunvale	83.0	34.7	14.2	14	76.3	0.43	-2.9	92.5	8.9	530	62.3	7.4	9.6	20.6	445	
Sunco	82.5	38.0	14.2	15	75.1	0.43	-3.2	92.6	8.6	450	62.4	5.5	6.5	21.8	355	

Source: EGA 2003/04 Queensland trials, quality results from Agrifood Technology

End Products	EGA Burke	Sunvale	Sunco
<i>Pan Bread – Straight</i>			
Volume (cc)	1050	905	930
Total Score (100)	77.1	83.4	88.6
<i>Pan Bread – Sponge &amp; Dough</i>			
Volume (cc)	1525	1650	1600
Total Score (100)	85.5	91.2	89.6
<i>Pan Bread – Rapid</i>			
Volume (cc)	1390	1410	1375
Total Score (100)	80.2	83.1	80.1
<i>Yellow Alkaline Noodles</i>			
Minolta L (24hrs)	74.7	68.0	73.7
Minolta b (24hrs)	31.1	24.1	27.7
△ Minolta L (24hrs)	8.0	12.0	7.8

Source: EGA 2003/04 Queensland trials, quality results from Agrifood Technology

## Gladius® (RAC1262)

**Pedigree** Complex Cross involving RAC875, Kukri, Excalibur and Krichauff  
**Bred & Selected by** Australian Grain Technologies Roseworthy wheat breeding team, in collaboration with SARDI.  
**Released by** Australian Grain Technologies

### Quality Characteristics

Based on testing of samples grown in South Australia the physical grain properties of Gladius are good. In particular, the kernel size of Gladius ranks between the large grain-sized varieties Yitpi and Frame. The milling performance of Gladius is good with purity adjusted flour yield generally 1% better than Janz and Yitpi. The flour colour of Gladius is close to the upper limit for yellowness, being similar to Frame. The paste viscosity of Gladius is average, similar to Janz.

The water absorption level of Gladius is marginal, tests show it to be lower than varieties such as Yitpi which displays acceptable levels. Farinograph dough development time and stability are long, and strong dough properties are reflected by high maximum resistance measurements. However, that strength is not matched in elasticity with Gladius having inextensible doughs.

The yellow alkaline noodle performance of Gladius is better than Janz, based on improved yellowness and lower colour stability. Baking performance of Gladius is acceptable in both straight and rapid methods although long mixing times are observed in tests conducted.

Gladius has been awarded an AH classification in South Australia.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)	
								Flour			Peak	WA	DDT	Stab	Extens
								(kg/hl)	(g)	(Nx5.7 11%mb)	(%)	(%) (14%mb)	(KJ)	L	b
<b>Gladius</b>	<b>78.6</b>	<b>33.0</b>	<b>13.0</b>	<b>14</b>	<b>74.8</b>	<b>0.44</b>	<b>-1.7</b>	<b>93.0</b>	<b>10.5</b>	<b>500</b>	<b>61.5</b>	<b>9.2</b>	<b>&gt;15</b>	<b>22.6</b>	<b>480</b>
Frame	82.4	35.4	13.5	15	75.4	0.46	-2.1	92.9	11.3	890	63.9	6.9	8.1	22.5	320
Yitpi	78.8	31.3	13.9	16	74.1	0.48	-1.6	93.2	9.9	920	62.3	6.5	8.9	24.0	345
Janz	79.6	29.0	13.2	13	73.6	0.46	-1.9	93.2	9.0	520	62.2	7.9	11.1	23.7	365

Source: AGT 2006/07 South Australian trials, quality results from Agrifood Technology

End Products	Gladius	Frame	Yitpi	Janz
<i>Pan Bread – Rapid</i>				
Volume (cc)	<b>1650</b>	1750	1675	1625
Total Score (100)	<b>90.6</b>	89.5	87.0	88.4
<i>Pan Bread – Straight</i>				
Volume (cc)	<b>900</b>	965	960	975
Total Score (100)	<b>84.4</b>	85.5	86.5	90.1
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	<b>69.8</b>	68.4	66.9	69.1
Minolta b (24hrs)	<b>28.1</b>	27.8	27.9	26.3
△ Minolta L (24hrs)	<b>12.4</b>	13.5	14.3	12.8

Source: AGT 2006/07 South Australian trials, quality results from Agrifood Technology

## Jandaroi® (Line E)

Pedigree 920777/110780 Advanced breeding lines  
 Bred & Selected by R A Hare, M Sissons, D L Gulliford, I Whitten, S Morphet, S Balfe and N Egan.  
 Released by NSW Department of Primary Industries

### Quality Characteristics

Based on available quality data from samples grown in northern NSW, the grain size of Jandaroi is similar to existing varieties being grown in this region of the wheat-belt. The protein achievement of Jandaroi is equivalent to other varieties with the exception of EGA Bellaroi, which is considered a high protein achieving variety.

Semolina yield has been within the ranges of control varieties. Most importantly, the semolina colour is acceptable. The yellowness of Jandaroi is ranked between Wollaroi and Yallaroi, the latter considered the lower limit for this critical trait. The water absorption level of Jandaroi is higher than durum control varieties, with the exception of EGA Bellaroi. The dough properties of this variety are strong, as measured by the extensograph, mixograph and alveograph instruments. Pasta evaluation of Jandaroi has produced acceptable product.

Jandaroi was awarded a Premium Durum classification in Queensland, northern New South Wales and South Australia.

Variety	Test Weight (kg/hl)	1000 Kernel Weight (g)	Wheat Protein (Nx5.7 11%mb)	HVK (%)	Semo Yield (%)	Flour Ash (%) (14%mb)	Minolta		Alveograph			Farinograph	
							Flour		P	L	W	WA (min)	DDT (BU)
							L	b					
<b>Jandaroi</b>	<b>79.8</b>	<b>41.6</b>	<b>14.8</b>	<b>97</b>	<b>70.6</b>	<b>0.79</b>	<b>83.7</b>	<b>29.5</b>	<b>166</b>	<b>59</b>	<b>405</b>	<b>60.4</b>	<b>8</b>
EGA Bellaroi	79.4	44.0	15.7	93	69.9	0.85	84.2	32.3	139	62	321	61.6	4.25
Kamilaroi	80.2	42.0	13.9	87	71.1	0.82	85.1	30.3	-	-	-	57.6	3
Wollaroi	80.1	43.2	14.9	79	71.1	0.78	85.0	29.8	68	102	215	57.4	4.25

Source: NSW DPI 2006 NNSW trials, quality results from NSW DPI Tamworth & Agrifood Technology

End Products	Jandaroi	EGA Bellaroi	Kamilaroi	Wollaroi
<i>Pasta</i>				
Minolta L (uncooked)	67	69	68	67
Minolta b (uncooked)	39.4	49.0	45.7	43.2
Minolta L (cooked)	68	73	74	71
Minolta b (cooked)	26.3	32.9	32.5	28.9
Optimal Cook Time (min)	12.3	12.0	12.3	12.3
Firmness	838	1020	1044	1027

Source: NSW DPI 2006 NNSW trials, quality results from NSW DPI Tamworth

## LongReach Catalina<sup>®</sup> (LPB0268)

Pedigree	VI184/Silverstar
Bred & Selected by	Selected by Dr Lindsay O'Brien from former VIDA breeding program, with further evaluation by LongReach Plant Breeders technical team, led by Dr Bertus Jacobs.
Released by	LongReach Plant Breeders

### Quality Characteristics

The physical quality of LongReach Catalina based on trials grown in South Australia and Victoria is good, with test weight, thousand kernel weights and screening levels all comparable or superior to a range of control varieties. The protein achievement of LongReach Catalina is also comparable with controls.

Milling performance of LongReach Catalina is considered good, with a high flour extraction rate coupled with a low flour ash level. Minolta b\* flour colour measurements ranked LongReach Catalina similar to Frame and Pugsley, both of which are considered to be at the upper end of yellowness tolerance. Amylograph and RVA measurements indicate that LongReach Catalina has high paste viscosity attributes.

The water absorption level of LongReach Catalina is acceptable, assessed as comparable with Yitpi. The dough properties of LongReach Catalina are generally strong, with acceptable levels of extensibility.

The yellow alkaline noodle performance of LongReach Catalina is considered poor, only being equivalent or inferior to controls that are not considered good for this end product. In both straight dough and rapid method tests, LongReach Catalina had acceptable performance.

LongReach Catalina has an AH classification in South Australia and Victoria.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)		
								Flour			Peak	WA	DDT	Stab	Extens	Max Height
								L	b							
<b>Catalina</b>	<b>81.9</b>	<b>39.4</b>	<b>12.2</b>	<b>15</b>	<b>77.4</b>	<b>0.44</b>	<b>0.0</b>	<b>92.5</b>	<b>10.6</b>	<b>590</b>	<b>61.0</b>	<b>4.8</b>	<b>11.0</b>	<b>21.1</b>	<b>360</b>	
Janz	81.9	35.2	12.7	15	76.7	0.43	-1.4	92.7	8.2	510	62.5	4.3	7.0	22.3	285	
Yitpi	81.7	41.2	12.2	16	76.0	0.45	-1.0	92.8	9.2	520	62.8	4.7	8.9	22.2	300	
Frame	83.6	47.0	11.9	15	76.2	0.48	-1.0	92.4	10.3	540	65.7	3.7	7.8	20.8	240	

Source: LongReach 2005/06 Victorian trials, quality results from Agrifood Technology

End Products	Catalina	Janz	Yitpi	Frame
<i>Pan Bread – Rapid</i>				
Volume (cc)	<b>1525</b>	1450	1550	1575
Total Score (100)	<b>79.1</b>	72.9	82.3	83.0
<i>Pan Bread – Straight</i>				
Volume (cc)	<b>930</b>	910	855	895
Total Score (100)	<b>82.6</b>	84.1	79.5	80.9
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	<b>70.2</b>	68.1	70.3	70.1
Minolta b (24hrs)	<b>28.3</b>	25.0	25.8	26.5
△ Minolta L (24hrs)	<b>12.0</b>	13.9	12.7	12.8

Source: LongReach 2005/06 Victorian trials, quality results from Agrifood Technology

## LongReach Crusader<sup>®</sup> (LPB03-1073)

Pedigree Sunbrook/H45  
 Bred & Selected by Dr Bertus Jacobs and LongReach Plant Breeders technical team.  
 Released by LongReach Plant Breeders

### Quality Characteristics

Assessments of trial samples grown in northern NSW have shown LongReach Crusader to have acceptable physical grain characteristics. The milling performance of this hard-grain variety is good, with it having high flour extraction levels coupled with low flour ash. The flour colour of LongReach Crusader is bright and slightly creamier than controls like Janz, Lang and Sunvale. RVA measurements suggest that LongReach Crusader has high paste viscosity attributes.

The water absorption level of LongReach Crusader is acceptable, being similar to Janz and Lang. Dough development time and stability measurements indicate that for these properties, LongReach Crusader is superior to Janz, Lang and Sunvale. The dough rheology attributes of LongReach Crusader are strong with good levels of extensibility.

The yellow alkaline noodle quality of LongReach Crusader is marginal for northern New South Wales, being slightly better than Janz, but inferior to Lang. The baking performance of LongReach Crusader is acceptable based on straight, and sponge and dough method tests.

LongReach Crusader is classified APH for northern NSW.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		RVA	Farinograph			Extensograph (45min)	
								Flour			Peak	WA	DDT	Stab	Extens
								L	b	(RVU)					
<b>Crusader</b>	<b>82</b>	<b>29.8</b>	<b>14.3</b>	<b>21</b>	<b>74.6</b>	<b>0.41</b>	<b>-1.1</b>	<b>90.8</b>	<b>8.6</b>	<b>212</b>	<b>64.0</b>	<b>8.0</b>	<b>12.1</b>	<b>24.1</b>	<b>403</b>
Janz	81	32.4	14.3	21	73.5	0.48	-1.4	90.5	7.9	193	62.7	8.0	10.6	24.1	438
Lang	82	30.2	14.6	19	73.4	0.47	-1.0	90.2	8.4	195	63.5	7.7	9.0	25.2	365
Sunvale	82	30.7	15.5	19	74.5	0.47	-0.4	89.9	8.3	193	66.3	9.2	12.7	>25.7	399

Source: LongReach 2006/07 NNSW Main series trials, quality results from DPI Victoria & Agrifood Technology

End Products	Crusader	Janz	Lang	Sunvale
<i>Pan Bread – Straight</i>				
Volume (cc)	<b>945</b>	915	950	935
Total Score (100)	<b>87.7</b>	84.7	85.6	86.8
<i>Pan Bread – Rapid</i>				
Volume (cc)	<b>1610</b>	1475	1525	1550
Total Score (100)	<b>89.4</b>	82.6	85.0	85.4
<i>Pan Bread – Sponge &amp; Dough</i>				
Volume (cc)	<b>1600</b>	1525	1575	1625
Total Score (100)	<b>88.9</b>	85.9	89.2	89.3
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	<b>69.0</b>	68.9	71.8	67.2
Minolta b (24hrs)	<b>26.0</b>	24.4	27.9	24.2
△ Minolta L (24hrs)	<b>13.0</b>	13.0	10.2	14.6

Source: LongReach 2005/06 NNSW Main series trials, quality results from Agrifood Technology

## LongReach Dakota<sup>®</sup> (LPB0780)

Pedigree VL676/VM729  
 Bred & Selected by Dr Bertus Jacobs and LongReach Plant Breeders technical team.  
 Released by LongReach Plant Breeders

### Quality Characteristics

Testing of LongReach Dakota samples grown in northern NSW have produced variable physical grain quality, which have been linked to seasonal conditions. The milling performance of LongReach Dakota is considered marginal, being similar to Diamondbird. High ash levels, flour and or wheat, have been commonly observed. The flour colour of LongReach Dakota is good being similar to Sunvale. The paste viscosity attributes of LongReach Dakota are good, with viscograph measurements higher than all control varieties to which it has been compared.

LongReach Dakota has acceptable water absorption. Dough mixing measurements suggest weakish dough properties, but extensograph tests have shown this variety to strong and balanced. Yellow alkaline noodles made from LongReach Dakota have been average to poor, with colour stability a major limitation. In contrast, its baking performance has been good to very good. In tests using the rapid, straight, and sponge and dough methods, LongReach Dakota has performed better than control varieties like Diamondbird, Janz and Sunco.

LongReach Dakota has an AH classification in northern NSW.

Variety	Test Weight (kg/hl)	1000 Kernel Weight (g)	Wheat Protein (Nx5.7 11%mb)	PSI	Extract Rate (%)	Flour Ash (% (14%mb)	Colour Grade (KJ)	Minolta		Visco (BU)	Farinograph			Extensograph (45min)	
								Flour			Peak	WA (%)	DDT (min)	Stab (min)	Extens (cm)
								L	b						
<b>Dakota</b>	<b>79.5</b>	<b>31.1</b>	<b>13.2</b>	<b>10</b>	<b>74.0</b>	<b>0.53</b>	<b>-1.5</b>	<b>92.8</b>	<b>8.9</b>	<b>730</b>	<b>61.6</b>	<b>6.7</b>	<b>11.3</b>	<b>23.9</b>	<b>415</b>
Janz	81.9	31.6	12.6	15	76.2	0.46	-2.3	93.1	8.7	500	60.8	6.5	14.1	21.2	300
Lang	81.5	30.0	12.6	14	75.7	0.50	-2.4	93.0	8.8	570	61.8	7.0	14.5	20.5	335
Sunvale	83.1	31.5	13.3	14	75.9	0.48	-2.2	92.8	8.9	610	62.5	8.2	>15	22.3	375

Source: LongReach 2005/06 NNSW Main series trials, quality results from Agrifood Technology

End Products	Dakota	Janz	Lang	Sunvale
<i>Pan Bread – Straight</i>				
Volume (cc)	<b>1025</b>	915	950	935
Total Score (100)	<b>93.3</b>	84.7	85.6	86.8
<i>Pan Bread – Rapid</i>				
Volume (cc)	<b>1800</b>	1475	1525	1550
Total Score (100)	<b>96.7</b>	82.6	85.0	85.4
<i>Pan Bread – Sponge &amp; Dough</i>				
Volume (cc)	<b>1725</b>	1525	1575	1625
Total Score (100)	<b>94.4</b>	85.9	89.2	89.3
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	<b>68.9</b>	68.9	71.8	67.2
Minolta b (24hrs)	<b>24.2</b>	24.4	27.9	24.2
△ Minolta L (24hrs)	<b>11.5</b>	13.0	10.2	14.6

Source: LongReach 2005/06 NNSW Main series trials, quality results from Agrifood Technology

## LongReach Guardian<sup>®</sup> (LPB0617)

Pedigree VL709/Krichauff  
 Bred & Selected by Selected by Dr Lindsay O'Brien from former VIDA breeding program, with further evaluation by LongReach Plant Breeders technical team, led by Dr Bertus Jacobs.  
 Released by LongReach Plant Breeders

### Quality Characteristics

Samples grown in Victoria and South Australia, indicate the physical grain quality of LongReach Guardian has been comparable with trial control varieties, notably Janz. Generally the protein content of LongReach Guardian has been lower than that of control varieties. The milling performance of LongReach Guardian is good, the result of high flour extraction rates. The flour colour of LongReach Guardian is acceptable, similar to Janz or Yitpi. LongReach Guardian is a variety with high paste viscosity.

The water absorption level of LongReach Guardian is not ideal for a hard-grained wheat. In comparisons with varieties considered to have average water absorption levels, LongReach Guardian had lower levels. LongReach Guardian has strong and slightly inextensible dough properties. Such properties supported by long Farinograph stability measurements, and long mixing times in bake tests.

The performance of LongReach Guardian in making yellow alkaline noodle is positive, with noodles being bright, yellow, and having good colour stability. Straight dough baking results have been acceptable, but results based on the rapid method are very good, despite a long mix time.

LongReach Guardian has been awarded an APW classification in both Victoria and South Australia.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)		
								Flour			Peak	WA	DDT	Stab	Extens	Max Height
								L	b							
<b>Guardian</b>	<b>81.7</b>	<b>36.0</b>	<b>11.7</b>	<b>15</b>	<b>77.8</b>	<b>0.50</b>	<b>-0.7</b>	<b>92.5</b>	<b>8.9</b>	<b>880</b>	<b>60.6</b>	<b>5.2</b>	<b>9.0</b>	<b>19.6</b>	<b>375</b>	
Janz	81.9	35.2	12.7	15	76.7	0.43	-1.4	92.7	8.2	510	62.5	4.3	7.0	22.3	285	
Yitpi	81.7	41.2	12.2	16	76.0	0.45	-1.0	92.8	9.2	520	62.8	4.7	8.9	22.2	300	
Frame	83.6	47.0	11.9	15	76.2	0.48	-1.0	92.4	10.3	540	65.7	3.7	7.8	20.8	240	

Source: LongReach 2005/06 Victorian trials, quality results from Agrifood Technology

End Products	Guardian	Janz	Yitpi	Frame
<i>Pan Bread – Rapid</i>				
Volume (cc)	<b>1610</b>	1450	1550	1575
Total Score (100)	<b>83.7</b>	72.9	82.3	83.0
<i>Pan Bread – Straight</i>				
Volume (cc)	<b>810</b>	910	855	895
Total Score (100)	<b>75.3</b>	84.1	79.5	80.9
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	<b>74.6</b>	68.1	70.3	70.1
Minolta b (24hrs)	<b>26.3</b>	25.0	25.8	26.5
△ Minolta L (24hrs)	<b>9.7</b>	13.9	12.7	12.8

Source: LongReach 2005/06 Victorian trials, quality results from Agrifood Technology

## Sentinel® (W29, LRI075)

Pedigree CC Benoist line H97807  
 Bred & Selected by Selected by breeders from CC Benoist. Selected and evaluated across Australia by LongReach Plant Breeders, under licence from Syngenta Seeds.  
 Released by LongReach Plant Breeders

### Quality Characteristics

Sentinel has combined good test weight levels with high thousand kernel weights, indicating excellent grain size excellent, which is comparable to Frame. The flour quality is less than desirable, with colour more yellow than creamy and comparable to Diamondbird. RVA and Viscograph tests indicate that Sentinel has average flour pasting attributes.

Sentinel's water absorption is comparable to Diamondbird and Frame and this is related to its very hard grain and low PSI values. Extensograph and Alveograph tests indicate that Sentinel has strong, but somewhat inextensible dough properties.

In rapid and straight dough bake tests, Sentinel has not performed as well as control varieties. Yellow alkaline noodle assessments have produced good brightness and stability, with better texture than the control varieties. Flat bread results were considered good, being comparable to Frame.

Sentinel has been classified as AWB Standard White across New South Wales, and in Victoria, South Australia, and Western Australia.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		RVA	Farinograph			Extensograph (45min)	
								Flour	Peak		WA	DDT	Stab	Extens	Max Height
	(kg/hl)	(g)	(Nx5.7 11%amb)		(%)	(% (14%amb)	(KJ)	L	b	(RVU)	(%)	(min)	(min)	(cm)	(BU)
<b>Sentinel</b>	<b>81.6</b>	<b>44.0</b>	<b>12.6</b>	<b>10</b>	<b>76.4</b>	<b>0.61</b>	<b>-0.2</b>	<b>91.0</b>	<b>10.5</b>	<b>278</b>	<b>60.9</b>	<b>4.8</b>	<b>6.8</b>	<b>17.5</b>	<b>350</b>
Diamondbird	82.4	37.6	12.7	11	73.9	0.60	0.3	90.9	10.5	352	60.8	6.0	12.3	20.1	359
Frame	82.2	43.5	11.7	12	77.0	0.60	-0.8	91.2	11.9	304	60.2	3.7	5.9	19.6	230

Source: LongReach Vic 2002/03 trials, quality results from BRI Australia through NWQTP testing

End Products	Sentinel	Diamondbird	Frame
<i>Pan Bread – Fermented</i>			
Average Volume (cc)	<b>740</b>	802.5	812.5
Total Score (100)	<b>57.5</b>	66	61.4
<i>Flat Bread</i>			
Total Score (100)	<b>86</b>	87.5	86.5
<i>Yellow Alkaline Noodles</i>			
Minolta L (1/2hr)	<b>79.7</b>	78.3	78.4
Minolta b (1/2hrs)	<b>26.5</b>	24.5	27.8
△ Minolta L (24hrs)	<b>8.2</b>	12.1	11.3

Source: LongReach Vic 2002/03 trials, quality results from BRI Australia through NWQTP testing



## Sunzell<sup>®</sup> (SUN404B)

Pedigree Sunbrook\*3/Sunstate  
 Bred & Selected by University of Sydney  
 Released by Australian Grain Technologies

### Quality Characteristics

Samples grown in New South Wales have shown Sunzell to have larger kernel size compared with early - seasoned varieties Sunbri and Sunbrook. Direct comparisons with Sunbri indicate that the grain protein achievement of Sunzell is around 1% lower.

The milling performance of Sunzell has been comparable with Sunbri, though that overall performance is a combination of high extraction rates and poor purity. The flour colour of Sunzell is acceptable. Farinograph dough mixing properties of Sunzell have been equivalent with a range of control varieties. Extensograph results indicate that Sunzell has balanced dough characteristics.

Sunzell has performed poorly in yellow alkaline noodle tests, with poor colour stability, and noodle sheet colour, in comparisons with Janz. In contrast Sunzell has baked well, having produced stand-out performances based on the sponge and dough method, eclipsing control varieties like Sunbri.

The assessment of available quality data for northern NSW resulted in Sunzell been awarded an AH classification, however, for southern NSW, Sunzell was awarded an APH classification given the different end product focus for wheat produced in this region.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)	
								Flour			Peak	WA	DDT	Stab	Extens
								L	b	(BU)					
<b>Sunzell</b>	<b>80.5</b>	<b>34.5</b>	<b>14.0</b>	<b>10</b>	<b>76.8</b>	<b>0.48</b>	<b>-2.5</b>	<b>92.7</b>	<b>9.9</b>	<b>820</b>	<b>61.2</b>	<b>8.2</b>	<b>8.7</b>	<b>21.9</b>	<b>395</b>
Sunbri	81.0	30.9	15.1	13	76.3	0.47	-3.0	92.8	9.5	560	60.6	7.9	6.5	25.1	390
Janz	78.5	29.4	14.8	13	75.0	0.55	-2.1	92.5	9.5	480	61.3	6.8	6.7	25.2	400
Lang	79.0	28.5	14.8	14	75.5	0.55	-2.9	92.7	9.7	540	61.5	7.3	10.2	>26.0	320

Source: PBIN 2004/05 NNSW trials, quality results from Agrifood Technology

End Products	Sunzell	Sunbri	Janz	Lang
<i>Pan Bread – Straight</i>				
Volume (cc)	<b>1010</b>	1050	1030	1015
Total Score (100)	<b>90.0</b>	93.6	92.8	89.9
<i>Pan Bread – Sponge &amp; Dough</i>				
Volume (cc)	<b>1840</b>	1570	1710	1680
Total Score (100)	<b>96.8</b>	87.8	93.8	89.9
<i>Yellow Alkaline Noodles</i>				
Minolta L (24hrs)	<b>64.1</b>	66.4	69.5	72.9
Minolta b (24hrs)	<b>22.3</b>	24.4	25.7	30.1
△ Minolta L (24hrs)	<b>17.1</b>	14.0	12.0	8.0

Source: PBIN 2004/05 NNSW trials, quality results from Agrifood Technology

## Yenda® (VN0870R)

Pedigree Bindawarra/Bowie//3Ag3/Wyuna  
 Bred & Selected by Victorian Dept. of Primary Industries and evaluated prior to release by Australian Grain Technologies  
 Released by Australian Grain Technologies

### Quality Characteristics

Yenda is a soft-grained wheat that has acceptable physical grain characteristics, though its grain size is smaller than Bowie. The milling performance of Yenda is very good. In comparisons with Bowie it has ranked higher, either on flour yield alone or on a combination of flour yield and purity results. The flour colour of Yenda is yellower than Bowie. The paste viscosity attributes of Yenda are very high, comparable with levels normally associated with noodle varieties.

The water absorption level of Yenda is low compared to Bowie, and has varied between being 2-4% less than Bowie depending on the environment and testing laboratory. Dough rheology assessments indicate the doughs have been weak with low extensibility. End product testing has produced acceptable cookie results. Limited steamed bread tests have indicated Yenda might be unsuitable for this product.

On available quality data, the domestic flour milling industry has accepted Yenda as a SOFT variety. From an export perspective, the AWB National Pool classification panel awarded Yenda a SOFT classification noting its excellent milling performance and attractive low water absorption.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)	
	(kg/hl)	(g)	(Nx5.7 11%mb)		(% (14%mb))	(KJ)	Flour		Peak (BU)	WA (%)	DDT (min)	Stab (min)	Extens (cm)	Max Height (BU)	
							L	b							
<b>Yenda</b>	<b>78.0</b>	<b>34.3</b>	<b>8.8</b>	<b>30</b>	<b>75.8</b>	<b>0.48</b>	<b>-2.4</b>	<b>94.3</b>	<b>9.3</b>	<b>1060</b>	<b>54.1</b>	<b>1.5</b>	<b>1.2</b>	<b>13.0</b>	<b>200</b>
Bowie	78.5	36.8	8.7	26	74.6	0.43	-2.4	94.6	8.6	440	57.8	1.4	1.6	12.9	195

Source: AGT 2003/04 trials, quality results from Agrifood Technology

End Products	Yenda	Bowie
<i>Cookie Test</i>		
Cookie Ratio	5.6	5.3
Cookie Spread	7.4	7.2
<i>Steamed Bread</i>		
Total Score (100)	46.6	60.1

Source: AGT 2003/04 trials, quality results from Agrifood Technology

## Young<sup>φ</sup> (VQ0326)

Pedigree VPM/3\*Beulah//Silverstar  
 Bred & Selected by Victorian Dept. of Primary Industries and evaluated prior to release by Australian Grain Technologies  
 Released by Australian Grain Technologies

### Quality Characteristics

Testing of samples from trials grown in Victoria and southern New South Wales trials over several seasons indicate Young to have small grain size. Milling performance quality of Young though is considered superior to all of the control varieties that it has been compared against. Adjustments for flour impurities indicate that the advantage be around 1%. Peak viscosity is average, being comparable to Janz and lower than Frame and Yitpi.

Young's water absorption level is less than ideal, considering its grain hardness, starch damage and protein level of the samples evaluated. Farinograph development time and stability results are longer than all controls and extensograph results indicate Young has superior dough strength to all the control varieties assessed.

Yellow alkaline noodles made from Young were average, but acceptable. The sheet colour was similar to Janz, however the colour stability was poorer. In straight dough bake test Young produced acceptable results. More favourable were results from rapid dough assessments, where Young's total score was equivalent or superior to the controls. Both baking evaluation methods highlighted a long mixing time.

Young has been classified AWB Hard in Victoria and Southern New South Wales.

Variety	Test Weight	1000 Kernel Weight	Wheat Protein	PSI	Extract Rate	Flour Ash	Colour Grade	Minolta		Visco	Farinograph			Extensograph (45min)	
								Flour			Peak	WA	DDT	Stab	Extens
								L	b	(BU)					
<b>Young</b>	<b>79.5</b>	<b>30.1</b>	<b>12.7</b>	<b>13</b>	<b>74.1</b>	<b>0.41</b>	<b>-3.1</b>	<b>93.1</b>	<b>9.3</b>	<b>350</b>	<b>59.9</b>	<b>8.2</b>	<b>10.3</b>	<b>22.9</b>	<b>440</b>
Annuello	82.0	32.9	12.4	11	74.1	0.48	-3.2	93.3	8.9	420	59.9	6.5	7.8	20.5	390
Frame	82.5	38.2	12.8	12	75.4	0.44	-3.7	93.3	10.8	640	63.6	6.5	7.9	17.8	320
Yitpi	81.0	38.9	13.2	11	73.7	0.43	-3.2	93.5	9.7	480	62.2	5.3	8.0	19.9	395

Source: AGT 2004/05 Victorian trials, quality results from Agrifood Technology

End Products	Young	Annuello	Frame	Yitpi
<i>Pan Bread - Rapid</i>				
Volume (cc)	<b>1500</b>	1445	1525	1400
Total Score (100)	<b>87.8</b>	83.4	85.7	84.3
<i>Pan Bread - Straight</i>				
Volume (cc)	<b>850</b>	975	880	815
Total Score (100)	<b>74.9</b>	88.2	81.0	74.2
<i>Yellow Alkaline Noodles</i>				
Minolta L (1/2hr)	<b>79.6</b>	78.8	80.2	81.4
Minolta b (1/2hrs)	<b>25.0</b>	26.6	28.2	25.3
Δ Minolta L (24hrs)	<b>13.5</b>	12.9	11.9	12.4

Source: AGT 2004/05 Victorian trials, quality results from Agrifood Technology