



VARIETY SUMMARY

- A **very quick** variety ideally suited for planting after **late breaks** or used in **'double knock' weed management plans**.
- Has excellent early vigour which is a bonus for competing with weeds and for establishment in colder winter conditions experienced when sowing is delayed.
- Suited to sowing in problem paddocks as will enable growers to delay seeding and control weeds such as resistant ryegrass with multiple herbicide applications before seeding.
- Has **CCN resistance** and useful levels of foliar disease resistance.
- Competitive yielding preliminary **APW** quality line, suited to **SA and Vic**.

Note: Bullet has a pedigree of Brookton/Silverstar and Screenings levels have been a concern in some locations/seasons.

PLANT CHARACTERISTICS

LongReach Bullet (LPB0423) is a fully awned semi-dwarf variety with medium-short plant height at maturity. It has a medium length coleoptile and exhibits good emergence, with excellent early vigour, for quick establishment, and provides good competition to winter weeds.

Bullet has a moderate tillering ability, with an erect nature and strong straw, and is moderately resistant to lodging and shattering.

Although Bullet does not have Boron tolerance it has yielded well in alkaline Mallee soils.

Good CCN resistance and improved resistance to Yellow Spot in comparison to Yitpi make Bullet a suitable choice for Mallee wheat-on-wheat rotations. Research shows Yellow Leaf Spot causes yield losses of 5-10%, and is a management issue in stubble retained, continuous wheat rotations.

Bullet has not displayed any sensitivity to any commonly applied pre or post emergent pesticides.

MATURITY

Bullet performs best when planted in late May - early June and is a quick variety with similar maturity to H45 and Wyalkatchem in South Australia.

AREA OF ADAPTATION

Bullet is suited to production in medium rainfall regions of South Australia, in particularly the Yorke Peninsula, and parts of Victoria.

YIELD

Bullet has demonstrated stable yield potential in LongReach trials and the NVT on alkaline soils of SA and Victoria, where yields have been superior to local benchmarks.

In yield trials conducted over four years in Southern Australia and Victoria it has been comparable with Wyalkatchem. Like Wyalkatchem it performs very well in dry years and early seasons with an early finish. Bullet has out-yielded standards such as Yitpi and Frame especially at sites with lower yields due to tough seasonal conditions.

Table 1: Bullet multi-site, multi-season yield comparison - South Australia & Victoria

SA & Victoria	Yield (t/ha)							Normalised Yield (% of Yitpi)						
	GRDC NVT		LongReach Trials					GRDC NVT		LongReach Trials				
	VIC07	2005	2007	2006	2005	2004	2003	VIC07	2005	2007	2006	2005	2004	2003
Variety														
Annuello	1.42	4.02	2.81	1.59	2.37	2.27	3.16	84	95	91	90	95	86	88
Bullet	1.78	4.10	3.12	1.86	2.62	2.59	3.40	105	97	101	105	105	98	95
Catalina	1.65	4.18	3.07	1.84	2.69	2.77	3.27	97	98	99	104	108	105	91
Correll	1.74	4.39	3.28	1.67	-	-	-	102	104	106	95	-	-	-
Frame	1.52	4.00	2.85	1.63	2.65	2.50	3.27	89	94	92	92	106	95	91
Guardian	1.64	4.26	3.18	1.86	2.86	2.87	3.55	97	101	103	105	115	108	99
Janz	1.49	3.94	2.73	1.65	2.60	2.49	-	88	93	88	93	104	94	-
Krichauff	-	3.34	3.23	1.79	-	-	-	-	79	104	101	-	-	-
Kukri	-	3.89	2.87	1.49	-	-	-	-	92	93	84	-	-	-
Pugsley	1.64	4.77	3.09	1.66	3.18	2.51	-	96	112	100	94	128	95	-
Scythe	1.87	4.13	3.31	1.88	-	-	-	110	97	107	106	-	-	-
Wyalkatchem	1.65	3.90	3.31	1.94	2.62	2.82	3.62	97	92	107	110	105	106	101
Yitpi	1.70	4.24	3.09	1.77	2.49	2.65	3.59	100	100	100	100	100	100	100
Young	1.82	4.32	3.27	-	-	-	-	107	102	106	-	-	-	-
Trial Mean Yield (t/ha)	1.52	4.12	2.81	1.64	2.42	2.35	3.24	1.52	4.12	2.81	1.64	2.42	2.35	3.24
No. of Trials	15	4	7	5	7	4	2	15	4	7	5	7	4	2

Note: LPB trials were not sprayed with fungicide.

Bullet was not entered into NVT 06 trials or South Australian NVT 07 trials.

GRAIN RECEIVAL QUALITY

Bullet has a final classification of APW in South Australia and Victoria.

Physical grain characteristics noted during AWBI's classification process have generally been equivalent to the controls such as Janz. In screenings tests Bullet has shown slightly higher screenings than Janz in tight finishing seasons when most varieties have high screenings. Refer to the Receival Standards tables below.

In eight LongReach Elite Stage 2 ('03) & Stage 3 ('04) trials, sown across Australia (predominantly in WA) which experienced tight season finishes, Bullet showed higher screenings than Janz and long season lines such as Chara.

Table 2: Bullet Grain Receival Quality (average SA, Vic & WA 2003 & 2004)

Variety	Test weight (kg/hl)			Thousand Kernel Weight (g)			Screenings (%)			Grain Protein (%)		
	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max
Carnamah*	80.1	75.0	83.1	35.8	31.4	39.7	3.0	0.3	6.3	11.0	9.5	14.5
Chara	80.4	74.8	84.0	33.1	27.3	37.9	3.5	0.4	9.8	11.9	10.3	15.5
Frame	81.3	78.4	83.8	38.9	34.3	45.9	1.8	0.1	3.7	11.5	9.2	15.2
Janz	80.7	73.7	84.1	32.3	28.4	35.8	3.6	0.3	11.5	11.3	9.8	14.4
Bullet	79.0	69.6	83.1	33.4	25.3	39.5	6.0	1.6	14.3	11.1	9.6	14.0
Westonia	78.8	73.1	83.0	37.7	30.4	43.2	2.5	0.3	6.5	10.9	9.4	13.4
Yitpi	80.6	78.4	83.4	36.5	24.3	42.7	2.2	0.1	4.9	11.3	9.5	14.4
Average	80.1	74.7	83.5	35.4	28.8	40.7	3.2	0.4	8.1	11.3	9.6	14.5

* Carnamah included in only 6 of the 8 sites.

In four LongReach Elite S5 ('06) trials sown across the Southern Alkaline region in SA & Vic, the receival standards data has again indicated higher average screenings in comparison with Janz.

Table 3: Bullet Grain Receival Quality (average SA & Vic in 2006)

Variety	Test weight (kg/hl)			Thousand Kernel Weight (g)			Screenings (%)			Grain Protein (%)		
	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max
Camm	76.7	75.3	78.1	31.7	27.6	35.7	8.4	2.5	14.2	14.4	13.7	15.1
Frame	79.9	77.4	82.2	39.1	35.5	47.3	1.9	0.4	3.7	12.8	11.1	15.2
Janz	77.5	74.5	80.9	33.0	30.1	35.4	3.2	0.5	5.8	12.4	10.9	14.4
Bullet	78.0	73.5	80.9	35.5	33.0	39.5	4.1	0.9	9.1	11.6	10.1	14.0
Pugsley	80.0	78.1	81.9	41.5	39.9	43.1	0.9	0.7	1.0	11.4	10.7	12.1
Yitpi	78.4	73.2	81.6	38.6	33.4	44.1	2.4	0.8	4.1	12.4	10.8	14.4
Average	79.0	76.1	81.7	37.0	34.1	40.4	2.9	1.2	5.3	12.4	11.0	14.0

Sites: Balaklava, Tarlee, Murrayville, Rudall.

Tests at Adelaide University have shown Bullet to be free of the Late Maturing Alpha-Amylase (LMA) defect. Bullet has equivalent pre-harvest sprouting resistance to Janz and it is Moderately Susceptible to Black Point.

DISEASE RESISTANCE

Bullet is rated Moderate Resistance to Stem rust and has a rating of MR-MS for Leaf rust. It has a rating of Moderately Susceptible for the WA pathotype of Stripe rust so will need to be monitored in epidemic years. Bullet does not rely on the VPM resistance genes and should not be significantly affected by the new WA+Yr17 Stripe rust pathotype, for which it has rating of Moderately Susceptible.

Bullet is rated Moderately Resistant to CCN and with useful levels of field resistance to Yellow Spot make it an option for late planting in wheat on wheat rotations.

Bullet is rated Moderately Susceptible and Intolerant to RLN (*P. thorneii*) and is Susceptible to Crown Rot.

Table 4: Disease and Pest Resistances of Bullet

Variety	Rust				Septoria tritici	Septoria nodorum	Yellow Spot Seedling	Crown Rot	Common Root Rot	CCN		RLN (<i>P.neglectus</i>)		RLN (<i>P.thorneii</i>)	
	Stripe		Leaf	Stem						Resistance	Tolerance	Resistance	Tolerance	Resistance	Tolerance
	WA	WA+Yr17													
ANNUELLO	MS	MS	MR-MS	MR	MS	-	S	S	MR	R	I	MS-S	MI	S	MI-I
BULLET	MS	MS	MR-MS	MR	MS	MS	MS-S	S	-	MR	-	-	-	MS	I
CARINYA	R	MR-MS	MR	R-MR	MS	-	S-VS	S	MS-S	S	-	S	-	S	-
CORREL	MR-MS	MR-MS	MS	MR-MS	MS	-	S-VS	MS-S	MS	MR	MT-MI	S	-	MS	-
DIAMONDBIRD	MS	MS	R-MR	MS-S	MS	-	S	MS-S	-	S	I	MS	MI	S	T
DRYSDALE	MS	MS	MS-S	MS	MS-S	-	MS-S	MS-S	S	S	-	MS-S	-	-	T
ELLISON	R	MR-MS	R	R-MR	S	-	R-MR	S-VS	MS-S	-	-	VS	-	S	MI-I
FRAME	MR-MS	MR-MS	MS	MS	MS	MS	S-VS	MS-S	S	MR	MT	MS-S	MT	S	MI
GREGORY	R	R-MR	R	MR-MS	MS-S	-	MS-S	S	MR	S	-	MS-S	-	MR-MS	MT
GUARDIAN	MS	MS	MS	MR	MS	-	MS-S	MS-S	MS	R	-	MS-S	-	S	I
H45	VS	VS	MR-MS	MR-MS	S-VS	-	MR-MS	MS-S	MS	S	I	MS	MT	MS	MI
JANZ	MR-MS	MR-MS	MS	R-MR	MS	-	S-VS	S	MS	S	I	MS-S	MI	S	MI-I
LANG	MR-MS	MR-MS	MS	R	MS	-	MS	MS	MR	-	-	VS	-	MS	MI-I
SCYTHE	MS-S	MS-S	MS-S	MR	MS-S	-	S	MS	MS	S	-	-	-	-	-
VENTURA	R	MS	R	R-MR	S	-	MS-S	MS-S	MR-MS	S	-	VS	-	MR-MS	MT
WYALKATCHEM	MS	MS	MR	MS	MR-MS	MR-MS	MR	S	S	S	MI-I	MR	MT-T	MS	-
YITPI	MR-MS	MR-MS	MS	S	MS	-	S-VS	S	MS	MR	MT	MR-MS	MT-T	MS	MI
YOUNG	R, MS	MS	MS	MR-MS	MS-S	-	MS	MS-S	MS-S	R	-	S	-	MR-MS	-

Notes: Resistance: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible, VS = Very Susceptible

Tolerance: T = Tolerant, MT = Moderately Tolerant, MI = Moderately Intolerant, I = Intolerant, VI = Very Intolerant

Table 5: Physical & Agronomic Characteristics of Bullet

Variety	Black Point	Pre Harvest Sprouting	Soil Boron	Acid Soils	Coleoptile	Maturity	Shattering	Height	Lodging
ANNUELLO	MI-I	I	I	-	M	MS	-	M	MR-MS
BULLET	MR-MS	S	MI	MI	M	Q	MR	M	MR
CARINYA	S	MI-I	I	I	M	MS	-	M	MR
CORREL	MR-MS	-	MT	T	M	-	-	M	-
DIAMONDBIRD	MT-MI	I	I	T-MT	M	MS	-	M	MS
DRYSDALE	MS	I	I	T-MT	M	Q	-	M	MS-S
ELLISON	MI	MT	I	-	M	Q	-	M	R
FRAME	S	S	MT	T	M	MS	-	M	R
GREGORY	MI	I	I	-	M	L	MR	M	MR-MS
GUARDIAN	MR-MS	S	MT	MI	M	M	-	M	MR
H45	S	S	I	MT	S	Q	-	T	MR-MS
JANZ	S-VS	S	I	I	M	MS	-	M	R-MR
LANG	MT	MS-S	I	I	M	MS	R-MR	T	MS-S
SCYTHE	VS	-	MI	VI	M	MS	-	M	MR-MS
VENTURA	MT-MI	S	I	T-MT	M	MS	R-MR	M	MR-MS
WYALKATCHEM	S	-	I	T	M	Q	-	S	MR-MS
YITPI	S	-	MT	T	M	MS	-	T	MR-MS
YOUNG	MI	I	I	MT	MS	MS	-	M	MR-MS

BREEDING HISTORY

Dr Lindsay O'Brien selected Bullet (LPB0423) in 2001, from early generation wheat germplasm bred by the Victorian Department of Primary Industries (Horsham) wheat-breeding program in association with the GRDC.

Since 2002 it has been further selected and evaluated in our national trials network by the LongReach Plant Breeders technical team, led by Dr Bertus Jacobs.

The line was entered in independent agronomy trials and has had limited testing in NVT trials in NSW, SA, Victoria and WA in 2005. In 2006 the line was entered into a late planted Time of Sowing trial on the Northern Yorke Peninsula, SA. In 2007 it has been entered into LongReach and NVT trials as well as a wider range of commercial trials in all relevant regions.

SEED AVAILABILITY

Seed is available from AWB Seeds, with distribution of Bullet through AWB SeedNet partners and all major seed retailers. Please call the AWB Growers Service Centre on 1800 054 433 or visit www.awbseeds.com.au

PLANT BREEDER RIGHTS AND ROYALTIES

Bullet is protected by Plant Breeder Rights, any unauthorised commercial propagation or any sale, conditioning, export, import or stocking of propagating material of this variety is an infringement under the Plant Breeder's Rights Act, 1994. Growers are allowed to retain seed from production of this variety for their own use as seed only. An End Point Royalty of \$2.75 per tonne (GST inclusive), which includes breeder royalties, applies to this variety. The EPR revenue will be invested directly back into the LongReach Plant Breeders program.

ACKNOWLEDGMENTS

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Disclaimer:

The information contained in this Fact Sheet is from official and other sources and is considered reliable at the time of publication. It is provided in good faith and every care has been taken to ensure its accuracy. LongReach Plant Breeders recommends you seek the advice of an independent consultant. LongReach Plant Breeders does not accept responsibility for the consequences of any decisions made based on this information.

Bullet Plant Type at Physiological Maturity:



Bullet Head Type at Physiological Maturity:

