PBA Jumbo$^{\Phi}$
Large red lentil

PBA
PULSE BREEDING AUSTRALIA
Better pulse varieties faster

Large seeded high yielding red lentil

KEY FEATURES

- Direct replacement for Aldinga in all areas
- Highest yielding large seeded red lentil (average yield 13-15% higher than Aldinga)
- Resistant to foliar and seed ascochyta blight
- Moderately susceptible to botrytis grey mould
- Plant type and lodging susceptibility similar to Aldinga
- Improved tolerance to soil boron and salinity over Aldinga and Nugget
- High milling quality lentil with grey seed coat
- Well suited to the removal of small broadleaf weed seeds from the harvested sample
- Suited to premium large red split lentil market

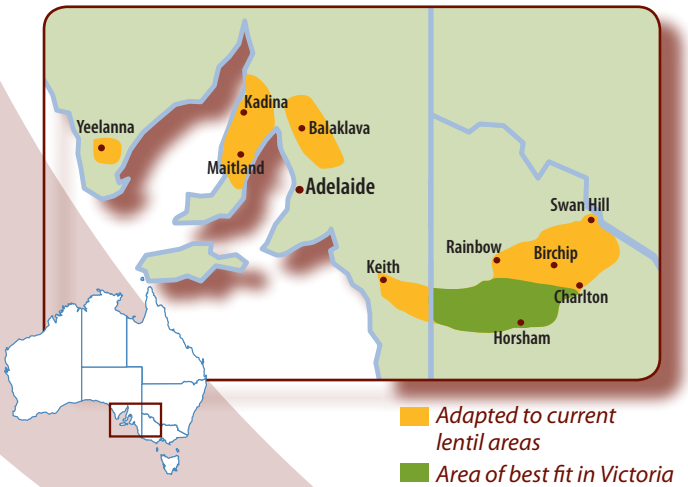
MAIN ADVANTAGES

PBA Jumbo$^{\Phi}$ is a high yielding large seeded red lentil. It is suited to most current lentil growing areas where it has consistently yielded around 15% higher than Aldinga. PBA Jumbo$^{\Phi}$ is resistant to foliar and seed infection by ascochyta blight which is vastly improved over Aldinga and Nugget. PBA Jumbo$^{\Phi}$ is well suited to no-till, inter-row sowing into standing stubble. It has a seed size and shape similar to Aldinga (20% larger than Nugget) with a grey seed coat. Attaining uniform larger seed size is more likely in medium to high rainfall regions. Milling quality is better than Nugget and it is well suited to premium large red split lentil markets such as those in Sri Lanka.

SEED PROTECTION & ROYALTIES

PBA Jumbo$^{\Phi}$ is protected under Plant Breeder's Rights (PBR) legislation. A PBR bag licence applies to the seed. Authorised growers can retain seed from production of PBA Jumbo$^{\Phi}$ for their own seed use. An End Point Royalty (EPR) of $5.50/t (including GST) applies to this variety when delivered to authorised EPR collectors. PBA Jumbo$^{\Phi}$ is also protected by a security system that can identify the lentil variety delivered to a receival site using genetic markers. Seed is commercialised through PBSeeds and available from 2011.

AREA OF ADAPTATION



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YIELD & ADAPTATION

- PBA Jumbo$^{\phi}$ has proven to be consistently high yielding in all lentil growing regions of southern Australia. In long term evaluation trials it has a 13-15% yield advantage over Aldinga, and a 10-12% advantage over Nugget.
- While it has high yields in low rainfall regions achievement of uniform large seed size may be difficult in short season environments.
- Botrytis grey mould must be controlled in disease prone environments to realise the yield and seed quality benefits of PBA Jumbo$^{\phi}$.
- PBA Jumbo$^{\phi}$ has a plant type similar to Aldinga and is more prone to lodging than Nugget, Nipper$^{\phi}$, PBA Flash$^{\phi}$ and PBA Blitz$^{\phi}$.
- PBA Jumbo$^{\phi}$ has large seed like Aldinga, and this may be an advantage if small weed seeds are required to be graded out of the harvested sample.

2003-2009 LONG-TERM YIELD OF LENTIL VARIETIES (Yields expressed as a % of Nugget's yield)

	South Australia				Victoria	
	Yorke P	Mid North	Lower EP	South East	Mallee	Wimmera
Site mean yield (t/ha)	1.92	1.79	1.46	2.08	1.34	1.25
Large red						
PBA Jumbo$^{\phi}$	112	112	109	109	109	107
Aldinga	97	97	95	95	96	93
Medium red						
PBA Blitz$^{\phi}$	108	111	109	106	107	106
PBA Flash$^{\phi}$	110	112	111	109	107	107
Cassab	93	94	95	-	94	92
Digger	94	96	96	95	95	93
Nugget	100	100	100	100	100	100
Small red						
PBA Bounty$^{\phi}$	105	105	104	102	105	104
Nipper$^{\phi}$	97	101	99	98	94	96
Northfield	93	92	91	92	90	91
Large green						
Boomer$^{\phi}$	105	104	104	104	102	99

Data courtesy of NVT, PBA, SARDI, DPI Victoria

AGRONOMIC AND DISEASE TRAITS OF LENTIL VARIETIES

	Vigour	Plant height	Flower time	Maturity	Lodging resistance	Pod drop	Shattering	Ascochyta blight		Botrytis grey mould	Boron	Salt
								Foliage	Seed			
Large red												
PBA Jumbo$^{\phi}$	Mod	Med	Mid	Mid	MS	MR	MR	R	R	MS	MI	MI
Aldinga	Mod	Med	Mid	Mid	S	MR	MR	MR	MS	MS	I	I
Medium red												
PBA Blitz$^{\phi}$	Mod/Good	Med/Tall	Early/Mid	Early	MR	MR	MR	R	MR	MR	I	I
PBA Flash$^{\phi}$	Mod	Med	Mid	Early/Mid	MR	MR	MR	MR	MR	S	MI	MI
Cassab	Mod	Med	Mid	Mid/Late	MS	MR	MR	MR	MS	MR	I	I
Digger	Mod	Med	Mid	Mid/Late	MS	MR	MR	MR	MS	MR	I	I
Nugget	Mod	Med	Mid	Mid/Late	MS/MR	MR	MR	MR	MS/MR	MR	I	I
Small red												
PBA Bounty$^{\phi}$	Mod	Short/Med	Mid/Late	Mid	MS	MR	MR	MR	MR	MS	I	MI
Nipper$^{\phi}$	Poor/Mod	Short	Mid/Late	Mid	MR	MR	MR	R	R	R	I	MT
Northfield	Poor/Mod	Short	Mid/Late	Mid	MS	MR	MR	R	R	S	I	MI
Large green												
Boomer$^{\phi}$	Good	Tall	Early/Mid	Mid/Late	MS	MR	MS	MR	MS	MR	I	I

Key: *Mod=moderate, Med=medium, S=susceptible, MS=moderately susceptible, MR=moderately resistant, R=resistant, I=intolerant, MI=moderately intolerant, MT=moderately tolerant.*

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DISEASE MANAGEMENT

A recommended fungicide seed dressing is beneficial for early control of seedling root rots and BGM.

Botrytis grey mould (BGM)

- PBA Jumbo$^{\Phi}$ is rated moderately susceptible to BGM and requires a higher level of management than for Nugget in wet years.
- Management should be as for Aldinga;
  - Consider wider row spacing and later sowing dates in BGM prone areas,
  - Apply a preventative fungicide at canopy closure in BGM prone areas,
  - Additional sprays will be required in wet spring conditions in BGM prone environments.

Ascochyta blight (AB)

- PBA Jumbo$^{\Phi}$ is resistant to AB on seed and foliage, similar to Nipper$^{\Phi}$ and greatly improved over Aldinga and Nugget, which is an advantage for seed quality.
- No fungicide seed dressing is needed specifically for AB. Unlike Nugget or Aldinga, sowing date of PBA Jumbo$^{\Phi}$ does not need to be delayed to avoid yield loss and seed infection by AB.
- AB protection in crop is unlikely to be required.

AGRONOMY

Agronomic characteristics

Paddock selection and basic requirements for growing PBA Jumbo$^{\Phi}$ are similar to other lentil varieties.

PBA Jumbo$^{\Phi}$ has the following characteristics;

- Mid flowering and maturity similar to Aldinga and Nugget,
- Medium plant height and height of pods, similar to Aldinga, Nugget and PBA Flash$^{\Phi}$,
- Susceptibility to lodging is similar to Aldinga and worse than PBA Flash$^{\Phi}$ and Nugget,
- Tolerance to salinity (NaCl) is similar to PBA Flash$^{\Phi}$ and PBA Bounty$^{\Phi}$, lower than Nipper$^{\Phi}$ but higher than all other varieties,
- Tolerance to soil boron is similar to PBA Flash$^{\Phi}$ and slightly improved over all other varieties.

Sowing

- Early sowing of PBA Jumbo$^{\Phi}$ will increase the risk of lodging and in disease prone areas, BGM. Timely management of BGM and harvest is required.
- Target plant densities of 120 plants/m^2 as for Nugget.
- Target similar sowing dates to Aldinga and Nugget.
- Target row spacing as for Aldinga and consider inter-row sowing into standing stubble to improve pod height, erectness and lodging resistance.

Herbicide tolerance

- The tolerance of PBA Jumbo$^{\Phi}$ to label rates of registered herbicides is similar to Aldinga and Nugget, based on visual observations from four years of trials conducted on calcareous alkaline clay loam soils in South Australia.

Crop topping and harvest

- PBA Jumbo$^{\Phi}$ matures at a similar time to Aldinga and Nugget but later than PBA Flash$^{\Phi}$. Yield loss or poor seed quality may result from the incorrect timing of crop topping, especially when crop maturity is delayed relative to the weeds which can occur with late sowing.
- PBA Jumbo$^{\Phi}$ is susceptible to lodging which makes it less prone to pod drop in windy environments compared with other more erect varieties. Delayed harvest may increase lodging. Timely harvest and optimum machine setup will minimise harvest difficulties, yield and quality losses.

QUALITY

Seed characteristics

PBA Jumbo$^{\Phi}$ is a large sized red lentil. It has a lens-shaped seed similar to Aldinga but with a grey seed coat. Seed size, as measured by 100 seed weight, is generally 20% greater than Nugget and similar to Aldinga. PBA Jumbo$^{\Phi}$ demonstrated improved seed milling characteristics compared to Nugget, and similar to Aldinga in laboratory testing.

PBA Jumbo$^{\Phi}$ Aldinga Nugget

REFER TO DETAILED INFORMATION AT www.pulseaus.com.au

Ute guides, crop and disease management bulletins

PULSE VMP Pulse Variety Management Package

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Quality assurance
Seed purity is very important in lentils with a restriction of 1% for varieties not of the same type. Prevent seed contamination when changing varieties, particularly where seed coat or cotyledon colour differs. Be particularly careful to avoid contamination of PBA Jumbo^{Φ} with either Aldinga or Boomer^{Φ}. Green lentil splits are yellow and as a contaminate will reduce the value of the red split lentil product. For seed cleaning purposes PBA Jumbo^{Φ} has a seed size similar to Aldinga and larger than Nugget.

Variety	Market category	Seed shape	Seed coat colour	Cotyledon colour	Seed size relative to Nugget
Large red					
PBA Jumbo^{Φ}	LRS	Lens	Grey	Red	20% >
Aldinga	LRS	Lens	Green	Red	20% >
Medium red					
PBA Blitz^{Φ}	MRS	Lens	Grey	Red	15-20% >
PBA Flash^{Φ}	MRS	Lens	Green	Red	0-10% >
Cassab	MRS	Lens	Grey	Red	Similar
Digger	MRS	Lens	Grey	Red	Similar
Nugget	MRS	Lens	Grey	Red	-
Small red					
PBA Bounty^{Φ}	SRP	Round	Grey	Red	10% <
Nipper^{Φ}	SRP	Round	Grey	Red	20% <
Northfield	SRP	Round	Tan	Red	20% <
Large green					
Boomer^{Φ}	LG	Lens	Green	Yellow	50% >

Key: *MRS=medium red (split), MRD=medium red (dual purpose), LRS=large red (split), LG=large green, SRP=small red (premium round), < = seed size less than Nugget, > = seed size greater than Nugget*

MARKETING
- PBA Jumbo^{Φ} fits into the premium human food market for large sized red split lentil. With high milling quality and endorsement of this variety by potential buyers, PBA Jumbo^{Φ} is expected to be highly competitive against Canadian large red lentils. Traditionally Australia has supplied Aldinga to these markets.
- Uniformity of large seed size is important in these markets.
- PBA Jumbo^{Φ} will be open marketed with an End Point Royalty, including breeders royalties, of $5.50/t (including GST) applied upon delivery.

BREEDING
PBA Jumbo^{Φ} (evaluated as CIPAL605) was developed by the PBA Lentil program, led by DPI Victoria. It was produced from a cross between a line from ICARDA, Syria (ILL5750 (Aldinga)) and a Canadian variety (Matador). PBA Jumbo^{Φ} is part of a pipeline of varieties that will be released by PBA in the next 4 years. PBA formed a commercial partnership with PBSeeds to multiply, manage and release PBA lentil varieties. PBSeeds and PBA are delivering varieties to growers 2-4 years earlier by fast tracking the identification, multiplication, generation of information and release of new varieties. The Southern Pulse Agronomy project has been integral to the process.

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PBA is an unincorporated joint venture between the GRDC, University of Adelaide, SARDI, DPI Victoria, I&I NSW, DEEDI, DAFWA and Pulse Australia.
It aims to deliver better pulse varieties faster.

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At PBSeeds we are leaders in the production of fine quality seed and grains. We take great care and pride in ensuring we match our customer's requirements. PBSeeds is proud to partner with PBA and invests in the improvement of Australian lentil varieties.

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