

# PBA KelpieXT<sup>Ⓛ</sup>

## Large red lentil

The information in this document is current as at November 2020.  
For updated information after this date, please refer to NVT results



# PBA

PULSE BREEDING AUSTRALIA

*Better pulse varieties faster*

## Herbicide tolerant large red lentil



### MAIN ADVANTAGES

PBA KelpieXT<sup>Ⓛ</sup> is a large red lentil with herbicide tolerance, the first one of its class in Australia. The early-mid flowering and maturity characteristics of this variety make it good for most lentil cropping regions of Australia.

This high yielding variety has the same mechanism of tolerance to group B herbicides as other tolerant lentil varieties such as PBA Hurricane XT<sup>Ⓛ</sup>, PBA Hallmark XT<sup>Ⓛ</sup> and PBA HighlandXT<sup>Ⓛ</sup>.

It has been provisionally rated as resistant/moderately resistant to botrytis grey mould (BGM) offering an additional advantage over most other XT lentils. PBA KelpieXT<sup>Ⓛ</sup> gives further market opportunities for growers by combining herbicide tolerance in the large seed market class, complementing previous small and medium red lentil releases.

### SEED PROTECTION & ROYALTIES

PBA KelpieXT<sup>Ⓛ</sup> is protected under Plant Breeder's Rights (PBR) legislation. A PBR bag license applies to the seed. Authorised growers can retain seed from production of PBA KelpieXT<sup>Ⓛ</sup> for their own use. An End Point Royalty (EPR) of \$5.94/t (including GST) applies to this variety for all grain sold and/or used on farm for feed. This EPR includes breeder royalties and the \$0.44/t (including GST) herbicide technology royalty to Agriculture Victoria Services Pty Ltd. Seed is commercialised by Seednet and will be available from 2021 for growers.

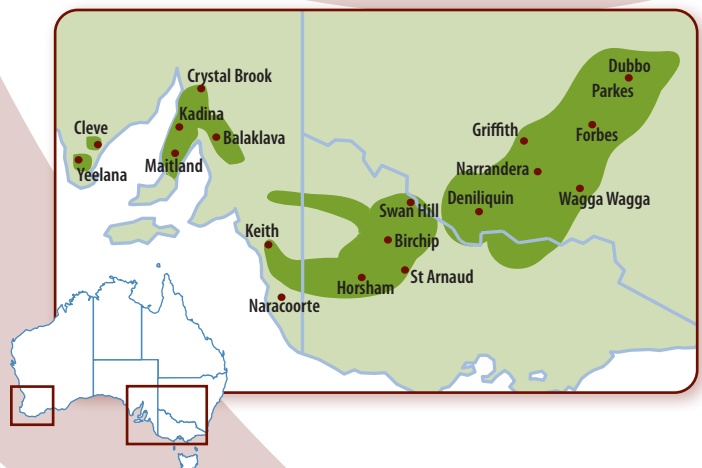
**Seednet**  
Planting Productivity

### KEY FEATURES

- Large red lentil
- Good early vigour
- Early-mid flowering and maturity
- Sound resistance to botrytis grey mould (R/MR)
- PBA KelpieXT<sup>Ⓛ</sup> and PBA Hurricane XT<sup>Ⓛ</sup> have the same herbicide tolerance
  - » Tolerant to applied imazethapyr at label rates\*
  - » Improved tolerance to applied flumetsulam\*
  - » Improved tolerance to residual levels of sulfonylurea and imidazolinone herbicide from prior crops\*

\*note that permits, product label rates, plant back periods and all label directions for use must be adhered to

### AREA OF ADAPTATION



### YIELD & ADAPTATION

PBA KelpieXT<sup>®</sup> is the first large red lentil variety with group B herbicide tolerance in Australia. It is adapted to key lentil cropping regions in Australia with considerable yield advantage over PBA Hurricane XT<sup>®</sup>. It yields better than PBA Hurricane XT<sup>®</sup> in most of the South Australian and Victorian regions and yields on par with PBA Hurricane XT<sup>®</sup> in New South Wales and Western Australian regions. In terms of seed size, PBA KelpieXT<sup>®</sup> is larger than PBA HighlandXT<sup>®</sup>, PBA Hallmark XT<sup>®</sup> and slightly smaller than PBA Jumbo2<sup>®</sup>.

PBA KelpieXT<sup>®</sup> has moderate to good vigour similar to PBA Jumbo2<sup>®</sup>. Its early to mid flowering and maturity windows are similar to PBA Bolt<sup>®</sup>.

The moderately resistant to moderately susceptible ascochyta rating and resistant to moderately resistant BGM rating will make PBA KelpieXT<sup>®</sup> a good variety for medium to high rainfall zones. Additionally, its resistance to pod drop and shattering will offer competitive advantages in growing environments characterised with wind and rain events around harvest.

A combination of high yield, better agronomic and disease resistance along with herbicide tolerance and large seeded market class will make PBA KelpieXT<sup>®</sup> a preferred variety in diverse lentil growing regions.

### DISEASE MANAGEMENT

There are two major diseases of lentil in Australia. PBA KelpieXT<sup>®</sup> has shown a moderate level of disease resistance to ascochyta blight (AB) and a sound level of resistance to botrytis grey mould (BGM). A fungicide seed dressing is beneficial for the early control of seedling root rots and foliar fungal diseases.

#### Ascochyta blight

- PBA KelpieXT<sup>®</sup> has been provisionally rated as Moderately Resistant to Moderately Susceptible (MR/MS) to foliar AB similar to PBA Hallmark XT<sup>®</sup> and PBA Hurricane XT<sup>®</sup>. It is rated as MR/MS against both the Nipper<sup>®</sup> virulent and the PBA Hurricane XT<sup>®</sup> virulent pathogen isolates in South Australia and Victoria. In cropping regions where there are more intense lentil rotations, prevalence of lentil crops and unfavourable conditions aiding disease progression, growers need to be aware that the AB isolates can potentially change over time, changing a variety's level of resistance to the disease.
- Lentil crops should always be monitored in severe disease risk environments and if these fungal disease symptoms are detected, fungicides should be applied from the start of podding, prior to any rainfall events.

2016–2019 NVT MET LONG TERM YIELD OF LENTIL VARIETIES (expressed as % of PBA Hurricane XT <sup>®</sup> yield)*												
Name	NSW		SA				VIC		WA			
	S/E	S/W	Lower EP	Mid North	Murray Mallee	South East	Yorke Pen.	Mallee	Wimmera	Agzone 1	Agzone 2	Agzone 5
Site mean yield (t/ha)	1.47	1.21	2.58	1.73	0.53	2.34	2.34	1.55	2.09	0.51	0.75	1.35
Number of trials analysed	2*	3*	2*	11	2*	3*	12	14	10	1*	1*	6*
<b>HERBICIDE TOLERANT VARIETIES</b>												
<b>Large</b>												
PBA KelpieXT <sup>®</sup>	<b>102</b>	<b>100</b>	<b>100</b>	<b>103</b>	<b>86</b>	<b>102</b>	<b>111</b>	<b>102</b>	<b>101</b>	<b>100</b>	<b>106</b>	<b>93</b>
<b>Medium</b>												
PBA HighlandXT <sup>®</sup>	110	105	96	106	91	101	106	108	110	122	128	113
PBA Hallmark XT <sup>®</sup>	108	104	98	104	110	101	104	103	107	112	117	106
<b>Small</b>												
PBA Hurricane XT <sup>®</sup>	100	100	100	100	100	100	100	100	100	100	100	100
<b>CONVENTIONAL VARIETIES</b>												
<b>Large</b>												
PBA Jumbo2 <sup>®</sup>	102	107	105	112	84	106	116	112	111	106	106	94
PBA Jumbo <sup>®</sup>	88	93	-	94	-	-	100	101	97	-	-	77
<b>Medium</b>												
PBA Ace <sup>®</sup>	97	105	88	102	94	95	100	104	111	119	111	103
PBA Blitz <sup>®</sup>	98	96	86	97	67	89	104	94	95	-	-	89
PBA Bolt <sup>®</sup>	105	101	97	100	89	99	102	105	102	110	107	105
PBA Flash <sup>®</sup>	95	99	101	103	-	100	105	108	99	95	87	93
<b>Small</b>												
Nipper <sup>®</sup>	90	83	99	91	86	91	96	89	85	69	70	64

\*Data courtesy of NVT, PBA, SARDI, DJPR Victoria, DPIRD and NSW-DPI

\*Yield data from a limited number of trials is unreliable and should be interpreted with caution; more yield evaluation required.

### Botrytis grey mould (BGM)

- PBA KelpieXT<sup>®</sup> is provisionally rated as Resistant to Moderately Resistant (R/MR) to BGM. This is equivalent to PBA Hallmark XT<sup>®</sup> and PBA Jumbo2<sup>®</sup> and better than PBA HighlandXT<sup>®</sup> and PBA Hurricane XT<sup>®</sup>.
- In BGM prone areas, lentil crops should be monitored and preventative foliar fungicide applied just prior to canopy closure. Further monitoring and fungicide sprays may be required in cropping regions with long growing seasons and when plant growth is high and/or prolonged wet spring conditions occur.

## AGRONOMY

PBA KelpieXT<sup>®</sup> has the following characteristics:

- Moderate to good early vigour (similar to PBA Hallmark XT<sup>®</sup> and PBA HighlandXT<sup>®</sup>).
- Early-mid flowering and maturity timing, similar to PBA Bolt<sup>®</sup>.
- Moderately susceptible to moderately resistant (MS/MR) to lodging, similar to PBA Ace<sup>®</sup>.
- Moderately resistant (MR) to pod drop and resistant (R) shattering traits (similar to PBA Hallmark XT<sup>®</sup>).
- Moderately intolerant (MI) to salinity (NaCl), similar to PBA HighlandXT<sup>®</sup> and a slight improvement from PBA Hurricane XT<sup>®</sup>.
- Intolerant to high soil boron (similar to PBA Hallmark XT<sup>®</sup> and PBA HighlandXT<sup>®</sup>).

### Sowing

- In cropping regions where conditions are prone to BGM development, PBA KelpieXT<sup>®</sup> should perform similar to PBA Jumbo2<sup>®</sup> with respect to early sowing.
- Target plant densities of 120 plants/m<sup>2</sup> adjusting sowing rates for lentil seed size and germination percentage of the seed used each year.

### Herbicide tolerance

- PBA KelpieXT<sup>®</sup> has tolerance to imazethapyr (similar to PBA Hurricane XT<sup>®</sup>) when applied pre- or post-emergence.
- PBA KelpieXT<sup>®</sup> has improved tolerance to flumetsulam (e.g. Broadstrike<sup>®</sup>) applied in crop.
- In conventional lentil varieties flumetsulam (applied according to label directions) may cause height reduction, crop discolouration, delayed flowering and yield loss.
- When flumetsulam is applied to PBA KelpieXT<sup>®</sup> or PBA HighlandXT<sup>®</sup> (according to label directions) the risk of crop damage and yield loss is minimised.
- PBA KelpieXT<sup>®</sup>, like PBA HighlandXT<sup>®</sup> and PBA Hallmark XT<sup>®</sup>, shows reduced sensitivities to some sulfonylurea and imidazolinone herbicide residues from previous crop applications.
- Preliminary evaluation in screening nurseries suggests that PBA KelpieXT<sup>®</sup>, PBA HighlandXT<sup>®</sup>, PBA Hallmark XT<sup>®</sup>, PBA Hurricane XT<sup>®</sup> and Nipper<sup>®</sup> are more sensitive to Group C herbicides (e.g. metribuzin and simazine) than other lentil varieties. However, label rates of metribuzin have been used on most lentil evaluation trials. When applying herbicides, growers must adhere to permits, product label rates, plant-back periods and all label directions for use.

### Crop desiccation and harvest

- The maturity timing of PBA KelpieXT<sup>®</sup> is similar to PBA HighlandXT<sup>®</sup> and earlier than PBA Hallmark XT<sup>®</sup> and PBA Hurricane XT<sup>®</sup>.
- Correct timing of crop desiccation, timely harvest and optimum machine setup will optimise yield and seed quality of PBA KelpieXT<sup>®</sup>, as will all other lentil varieties.

AGRONOMIC AND DISEASE TRAITS OF LENTIL VARIETIES											
Name	Vigour	Flowering time	Maturity	Lodging resistance	Pod drop	Shattering	Ascochyta blight		Botrytis grey mould	Boron	Salt
							AB Foliar (SA)	AB Foliar (VIC/NSW/WA)			
<b>HERBICIDE TOLERANT VARIETIES</b>											
PBA KelpieXT <sup>®</sup>	Mod/Good	Early/Mid	Early/Mid	MS/MR	MR	R	MR/MS*	MR/MS*	R/MR	I	MI
PBA HighlandXT <sup>®</sup>	Mod/Good	Early	Early/Mid	MR	MR	MR	MR	MR	MR/MS	I	MI
PBA Hallmark XT <sup>®</sup>	Mod/Good	Mid	Mid	MR	MR	R	MR/MS	MR	R/MR	I	MI
PBA Hurricane XT <sup>®</sup>	Good	Mid	Mid	MR	MR	R	MR/MS	MR/MS	MR/MS	I	I
<b>CONVENTIONAL VARIETIES</b>											
PBA Jumbo2 <sup>®</sup>	Mod/Good	Mid	Mid	MS/MR	MR	R	R	R	R/MR	MI	I
PBA Jumbo <sup>®</sup>	Mod	Mid	Mid	S	MR	MR	MR/MS	MR/MS	MS	MI	I
PBA Ace <sup>®</sup>	Good	Mid	Mid	MS/MR	R	MS/MR	R/MR	R/MR	MR/MS	I	I
PBA Blitz <sup>®</sup>	Mod/Good	Early	Early	MS/MR	MR	MR	MR	MR	MR	I	I
PBA Bolt <sup>®</sup>	Mod/Good	Early/Mid	Early/Mid	R	R	R	MR	MR	S	MI	MI
PBA Flash <sup>®</sup>	Mod	Early/Mid	Early/Mid	MR	MR	MR	MS	MS	MR/MS	MI	MI
Nipper <sup>®</sup>	Poor/Mod	Mid/Late	Mid	MR	MR	MR	MR/MS	MR	R/MR	I	MT

Key: S=susceptible, MS=moderately susceptible, Mod=moderate, MR=moderately resistant, R=resistant, I=intolerant, MI=moderately intolerant, MT=moderately tolerant, \*provisional rating

# PBA KelpieXT<sup>®</sup>

## Large red lentil



*Better pulse varieties faster*

PBA is an unincorporated joint venture between the GRDC, University of Adelaide, University of Sydney, SARDI, Agriculture Victoria Research, NSW DPI, DAF (QLD), DPIRD WA and Pulse Australia.

## SEED QUALITY

### Seed characteristics

PBA KelpieXT<sup>®</sup> is a lens shaped large red lentil variety with a grey seed coat. Seed size (as measured by average 100 seed weight) is slightly smaller than PBA Jumbo2<sup>®</sup> and bigger than PBA HighlandXT<sup>®</sup> and PBA Hallmark XT<sup>®</sup>. As with all other lentil varieties, seasonal variations may occur.

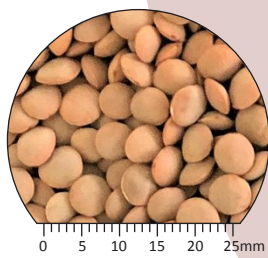
### Quality assurance

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 cotyledon or seed coat colour differs.

Be particularly careful to avoid contamination of PBA KelpieXT<sup>®</sup> with green lentils, such as PBA Giant<sup>®</sup> or PBA Greenfield<sup>®</sup>, as when split the yellow kernel of the green lentil seeds will contaminate and reduce the value of the red lentil product.

Name	Seed shape	Seed coat colour	Cotyledon colour	Seed size (%) rel. to PBA Jumbo2 <sup>®</sup>
<b>HERBICIDE TOLERANT VARIETIES</b>				
PBA KelpieXT <sup>®</sup>	Lens	Grey	Red	93
PBA HighlandXT <sup>®</sup>	Lens	Grey	Red	75
PBA Hallmark XT <sup>®</sup>	Lens	Grey	Red	83
PBA Hurricane XT <sup>®</sup>	Round	Grey	Red	70
<b>CONVENTIONAL VARIETIES</b>				
PBA Jumbo2 <sup>®</sup>	Lens	Grey	Red	100
PBA Ace <sup>®</sup>	Lens	Grey	Red	90
PBA Bolt <sup>®</sup>	Lens	Grey	Red	88
Nipper <sup>®</sup>	Round	Grey	Red	64

*\*data based on 100 GWT of each varieties across multiple years and locations*



PBA KelpieXT<sup>®</sup>



Nipper<sup>®</sup>

## MARKETING

- PBA KelpieXT<sup>®</sup> fits into the large sized red lentil class for the human food market.
- PBA KelpieXT<sup>®</sup> should be segregated for marketing unless otherwise stated.
- PBA KelpieXT<sup>®</sup> will be open marketed with an End Point Royalty (EPR) of \$5.94/t (incl. GST), applying upon delivery.

## BREEDING

PBA KelpieXT<sup>®</sup> (evaluated as CIPAL1721) was developed by conventional plant breeding techniques and selected from a cross between PBA Blitz<sup>®</sup> and 04-197L-2-05HSHI2012, a breeding line. It was developed by the PBA lentil breeding program using technology from Agriculture Victoria Services Pty Ltd. The Southern Pulse Agronomy program led by Dr Jason Brand was an integral part of the evaluation process. The breeding program's partnership with Seednet managed PBA KelpieXT<sup>®</sup>'s seed multiplication process and commercialised the release of the variety.

## PULSE AGRONOMY

Agronomy and disease management information has been developed with the assistance of the 'Southern region pulse agronomy project' co-funded by GRDC, SARDI, DEDJTR Victoria and NSW DPI.

## FOR MORE INFORMATION

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Seednet's mission is:

*"To deliver high performance seed based genetics to Australian grain growers and end user customers via superior product and service delivery channels."*



Seednet is proud to partner with Pulse Breeding Australia and invest in the improvement of Australian lentil varieties.

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