

# PBA Seamer<sup>®</sup>

## Desi Chickpea



# PBA

PULSE BREEDING AUSTRALIA

*Better pulse varieties faster*

## Ascochyta blight resistant desi chickpea



*PBA Seamer (right) has superior Ascochyta blight resistance than Jimbour (left).*

### KEY FEATURES

- Resistant to Ascochyta blight (> PBA HatTrick and PBA Boundary)
- Moderately resistant to Phytophthora root rot (= PBA HatTrick)
- Semi-erect plant type with good lodging resistance at maturity
- Early to mid-flowering and mid-maturity
- Excellent milling quality

### MAIN ADVANTAGES

PBA Seamer<sup>®</sup> is an improved desi chickpea for the northern region with the highest available Ascochyta blight resistance rating (rated R). It is broadly adapted from central NSW to central Queensland, with significantly higher grain yield than all current varieties in high disease years.

PBA Seamer<sup>®</sup> has a semi-erect plant type with superior lodging resistance to PBA HatTrick<sup>®</sup> and PBA Boundary<sup>®</sup>. PBA Seamer<sup>®</sup> has improved seed quality with larger seed size than PBA HatTrick<sup>®</sup> and higher dhal milling yield than all current varieties in southern QLD and northern NSW.

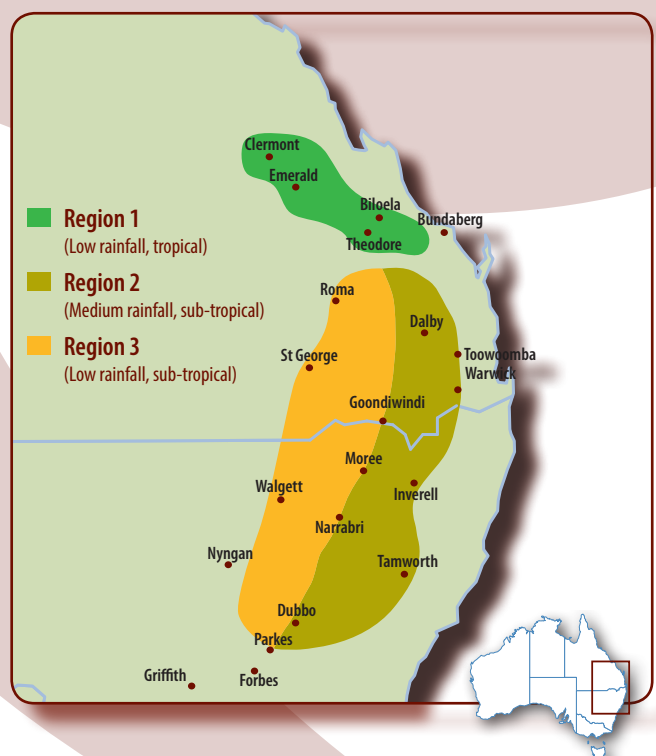
### SEED PROTECTION & ROYALTIES

PBA Seamer<sup>®</sup> is protected under Plant Breeder's rights (PBR) legislation. Growers can only retain seed from their production of PBA Seamer<sup>®</sup> for their own use.

An end point royalty (EPR) of \$4.40 per tonne (GST inclusive), which includes breeder royalties, applies upon delivery of this variety. Seed is available from the commercial partner, Seednet.

**Seednet**  
Planting Productivity

### AREA OF ADAPTATION



Long-term yield of desi chickpea, % of PBA Pistol <sup>®</sup> in central Queensland and % of PBA HatTrick <sup>®</sup> in north-eastern Australia (2011–2015)						Yield of desi chickpea, % of PBA HatTrick <sup>®</sup> , in north-eastern Australia in 2010, a wet winter and spring conducive to AB and BGM					
Variety	Central Qld	South Western Qld	South Eastern Qld	North Western NSW	North Eastern NSW	Tamworth	North Star	Edgeroi	Moree	Bellata	Bullarah
PBA Pistol <sup>®</sup> (t/ha)	2.51	–	–	–	–	–	–	–	–	–	–
PBA HatTrick <sup>®</sup> (t/ha)	2.33	1.9	2.81	1.55	1.94	3.51	1.67	2.26	2.67	1.89	1.82
<b>PBA Seamer<sup>®</sup></b>	<b>99</b>	<b>104</b>	<b>101</b>	<b>102</b>	<b>101</b>	<b>108</b>	<b>119</b>	<b>137</b>	<b>112</b>	<b>142</b>	<b>118</b>
PBA Boundary <sup>®</sup>	97	104	104	103	102	110	104	105	108	109	93
PBA HatTrick <sup>®</sup>	93	100	100	100	100	100	100	100	100	100	100
PBA Pistol <sup>®</sup>	100	–	–	–	–	–	–	–	–	–	–
Jimbour <sup>®</sup>	94	102	102	101	101	105	56	10	97	96	60
Kyabra <sup>®</sup>	101	107	107	109	106	110	46	6	97	111	60
Moti <sup>®</sup>	101	–	–	–	–	–	–	–	–	–	–

**Source:** Trial results from Pulse Breeding Australia (PBA) and National Variety Trials (NVT) programs.

This report presents NVT "Production Value" MET data on a regional mean basis. This reduces the accuracy and reliability of the results. For detailed PV data, please use the NVT Yield App or Excel Reporting tools available on the NVT website.

Disease resistance rating and yield loss of desi chickpea in north-eastern Australia										
Variety	Ascochyta blight (AB) <sup>1</sup>					Phytophthora root rot (PRR) <sup>2</sup>				
	Resistance rating	Yield (t/ha) <sup>3</sup>		% Yield loss		Resistance rating	Yield (t/ha) <sup>3</sup>		% Yield loss	
		2014	2015	2014	2015		2014	2015	2014	2015
PBA Seamer <sup>®</sup>	R	2.13	1.57	2	15	MR	1.79	0.37	45	87
PBA Boundary <sup>®</sup>	MR	2.08	1.23	11	30	S	0.73	0.17	74	94
PBA HatTrick <sup>®</sup>	MR	1.76	0.42	23	76	MR	1.98	0.81	33	68
PBA Pistol <sup>®</sup>	S	Not tested				S	Not tested			
Kyabra <sup>®</sup>	S	0.00	0.00	100	100	MS	Not tested			
Moti <sup>®</sup>	S	Not tested				MS	Not tested			
Yorker <sup>®</sup>	MS	Not tested					2.69	0.57	33	79
PBA Seamer <sup>®</sup> disease free		2.18	1.85				3.23	2.76		

**Source:** NSW DPI and DAF Pulse pathology and breeding teams

<sup>1</sup> Ascochyta blight yield loss trial, Tamworth 2014 & 2015, NSW DPI

<sup>2</sup> Phytophthora root rot yield loss trial, Warwick 2014 & 2015, NSW DPI & DAF

<sup>3</sup> Yields are in the presence of high disease with no fungicide applications

Agronomic traits of desi chickpea in north-eastern Australia											
Variety	Flowering (score/days) <sup>#</sup>		Maturity (score) <sup>#</sup>		Plant height (cm)		Lowest pod height (cm)		Lodging resistance	Lodging score <sup>##</sup>	
	Region 2 & 3 <sup>1</sup>	Region 1 <sup>2</sup>	Region 2 & 3 <sup>1</sup>	Region 1 <sup>2</sup>	Region 2 & 3 <sup>1</sup>	Region 1 <sup>2</sup>	Region 2 & 3 <sup>1</sup>	Region 1 <sup>2</sup>	Region 1 <sup>2</sup> & 3 <sup>1</sup>	Region 2 & 3 <sup>1</sup>	Region 1 <sup>2</sup>
PBA Seamer <sup>®</sup>	E–M (4.4)	E–M (67)	M (5.1)	E–M (4.1)	55.2	60.5	30.7	33.0	Good	1.7	2.8
PBA Boundary <sup>®</sup>	M–L (5.9)	M (69)	M (5.3)	M (5.3)	57.8	63.6	35.1	35.4	Mod	2.3	4.5
PBA HatTrick <sup>®</sup>	M (5.0)	E–M (67)	M (5.1)	M (5.0)	56.2	60.7	32.8	33.3	Mod	2.4	4.9
Jimbour <sup>®</sup>	M (4.9)	–	M (4.9)	–	55.3	–	32.6	–	Good	1.8	–
Kyabra <sup>®</sup>	E–M (4.7)	E–M (68)	M (4.9)	E–M (4.5)	55.6	60.9	33.0	34.5	Good	1.7	3.2
PBA Pistol <sup>®</sup>	–	E (65)	–	E (3.5)	–	66.7	–	35.0	–	–	2.8
Moti <sup>®</sup>	–	E–M (68)	–	E–M (4.1)	–	60.2	–	34.4	–	–	2.8

<sup>#</sup>Flower & Maturity score, 1 = very early, 9 = very late (E=early, M=mid, L=late)

<sup>1</sup>Data collected from sites in southern QLD and northern NSW (2011–2015)

<sup>##</sup>Lodging score, 1 = fully erect, 9 = flat on ground

<sup>2</sup>Data collected from sites in central QLD (2012–2015)

### YIELD & ADAPTATION

- PBA Seamer<sup>db</sup> is generally well adapted to those areas of Region 1 (central Qld), Region 2 (central/north-western slopes and plains of NSW and Darling Downs of Qld) and Region 3 (central/north-western plains of NSW and Western Downs/Maranoa of Qld) where chickpeas are currently grown.
- PBA Seamer<sup>db</sup> has similar yields to PBA Pistol<sup>db</sup> in central QLD and PBA HatTrick<sup>db</sup> in southern QLD and northern and central NSW.
- PBA Seamer<sup>db</sup> is not recommended for southern NSW, Victoria, South Australia or Western Australia chickpea growing regions where yields are lower than currently recommended varieties.

### DISEASE MANAGEMENT

#### Ascochyta blight (AB)

- Results from yield loss trials and screening nurseries demonstrate that PBA Seamer<sup>db</sup> is significantly more resistant to Ascochyta than PBA HatTrick<sup>db</sup> and PBA Boundary<sup>db</sup>.
- The Resistant Ascochyta rating means that, in the target regions disease development will normally be very slow, with minimal yield loss in most seasons.
- In most seasons, there is no cost benefit in applying a fungicide before Ascochyta is detected.
- In seasons of high Ascochyta pressure, a reactive foliar fungicide program and at least one pod protective spray may be warranted.
- Monitor the crop 10–14 days after each rain event and if Ascochyta is detected, consult your agronomist.

#### Phytophthora root rot (PRR)

- PBA Seamer<sup>db</sup> is rated as Moderately Resistant to Phytophthora based on results from screening nurseries and yield loss trials. Although three yield loss trials have indicated useful resistance, a conservative approach to paddock selection would be prudent.
- Avoid paddocks that have either: (1) a history of PRR in chickpea, irrespective of when chickpea was last grown, and (2) a likelihood of prolonged waterlogging following heavy rain.

#### Botrytis grey mould (BGM)

- Controlled environment testing, confirmed by opportunistic field testing in 2010, indicates that PBA Seamer<sup>db</sup> is Moderately Susceptible to Botrytis and its good lodging resistance can be an advantage under high biomass situations (e.g. 2010).
- A registered fungicide seed dressing is highly recommended for early control of seedling root rots, seed transmitted ascochyta blight and botrytis

seedling disease. Monitor for BGM in spring as temperatures and humidity rise. Apply a fungicide containing either carbendazim or mancozeb once BGM has been identified within the crop.

#### Virus

- PBA Seamer<sup>db</sup> is rated as Moderately Susceptible to the major chickpea viruses, similar to other regional varieties.
- Retention of cereal stubble, timely sowing and establishment of the recommended plant population (see below) provide the most effective management in virus-prone districts.

### AGRONOMY

#### Agronomic characteristics

- PBA Seamer<sup>db</sup> has a semi-erect plant type compared to the erect plant type of PBA HatTrick<sup>db</sup> and PBA Boundary<sup>db</sup>.
- PBA Seamer<sup>db</sup> is slightly shorter (1–3 cm), the lowest pod height is 3–5 cm lower and lodging resistance is superior to PBA HatTrick<sup>db</sup> and PBA Boundary<sup>db</sup>. It flowers slightly earlier than PBA HatTrick<sup>db</sup> but has the same harvest maturity.
- The combination of semi-erect habit, excellent lodging and ascochyta blight resistance make PBA Seamer<sup>db</sup> well adapted to the higher rainfall environments in southern QLD and central/northern NSW. PBA Seamer<sup>db</sup>'s potential yield can be optimised in these environments when planted on narrower rows, 25–50 cm, at a high density (30 plants/m<sup>2</sup>).

#### Sowing

- Target the optimum planting window for your area, but avoid very early sowing (to minimise the risk of lodging).
- Sow high quality seed at rates calculated to achieve 25–30 plants/m<sup>2</sup> establishment. Typically 60 to 75 kg/ha depending upon germination percentage, vigour and planting conditions.
- Inoculate with Group N Chickpea rhizobial inoculum.

#### Tolerance of abiotic stresses

- Moderately intolerant of salt, similar to PBA HatTrick<sup>db</sup> and PBA Boundary<sup>db</sup>.
- There is no evidence of increased sensitivity to vegetative frost compared to other desi varieties.

#### Herbicide tolerance

- PBA Seamer<sup>db</sup> has performed similarly to PBA HatTrick<sup>db</sup> to most registered pre- and post-emergent herbicides applied at recommended rates in screening nurseries on alkaline soils in SA.

# PBA Seamer<sup>®</sup>

## Desi Chickpea

### SEED QUALITY

PBA Seamer<sup>®</sup> is a standard 'Indian' type desi chickpea with an angular seed shape. Seed size is larger than PBA HatTrick<sup>®</sup> and PBA Boundary<sup>®</sup> (predominantly 7 mm) with similar seed colour. Milling quality is excellent giving dhal yields 2–5% higher than other varieties commonly grown in southern QLD and northern NSW.

Variety	Seed weight (g/100)	Dhal yield (%)	Seed weight (g/100)	Dhal yield (%)
	Southern QLD and Northern NSW		Central QLD	
PBA Seamer <sup>®</sup>	22.6	52.5	22.2	53.5
PBA Boundary <sup>®</sup>	20.0	48.1	20.9	50.9
PBA HatTrick <sup>®</sup>	20.8	46.3	20.6	50.6
Jimbour <sup>®</sup>	19.7	48.3	23.8	55.5
Kyabra <sup>®</sup>	23.6	49.9	23.6	56.0

**Source:** Pulse Breeding Australia

- Southern QLD & Northern NSW Seed weight data is average of 31 sites across 4 years (2012–15)
- Southern QLD & Northern NSW Dhal yield data is an average of 18 sites across 4 years (2012–2015)
- Central QLD Seed weight data is average of 6 sites across 3 years
- Central QLD Dhal yield is average of 2 sites in 2013



PBA HatTrick<sup>®</sup>



PBA Seamer<sup>®</sup>

### MARKETING

The dhal is a similar shape to PBA HatTrick<sup>®</sup> and has the distinct dimpling required by Indian markets to differentiate it from field pea dahl. Favourable feedback on the seed quality of PBA Seamer<sup>®</sup> by both domestic and international traders has been received.

### BREEDING

PBA Seamer<sup>®</sup> (evaluated as CICA0912) was developed by the PBA chickpea breeding program (led by NSW Department of Primary Industries) from a cross between the breeding line 98081-3024 and PBA HatTrick<sup>®</sup>.

### PULSE AGRONOMY

Agromony management information has been compiled from experiments conducted by the 'Northern Pulse Agromony Initiative' project, co-funded by GRDC, NSW DPI, DAF and QAAFI/UQ.



## Better pulse varieties faster

PBA is an unincorporated joint venture between the GRDC, University of Adelaide, University of Sydney, SARDI, DEDJTR Victoria, NSW DPI, QLD DAF, DAFWA and Pulse Australia.

It aims to deliver better pulse varieties faster.

### FOR MORE INFORMATION

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### SEED ENQUIRIES

#### Seednet

#### National Production and Logistics Office

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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 desi chickpea varieties.

### AGRONOMIC ENQUIRIES

#### Central and Northern New South Wales

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