

# PBA HatTrick<sup>®</sup>

## Desi Chickpea



# PBA

PULSE BREEDING AUSTRALIA

*Better pulse varieties faster*

## Ascochyta & Phytophthora resistant chickpea



### MAIN ADVANTAGES

PBA HatTrick<sup>®</sup> is an Ascochyta blight resistant desi chickpea that is well suited to all current chickpea growing areas in Northern NSW and Southern Qld.

It is the first variety to combine moderate to high levels of resistance to the two key disease limitations in north-eastern Australia (Ascochyta blight and Phytophthora root rot).

PBA HatTrick<sup>®</sup> also captures the plant architecture, yield potential, broad adaptation and seed quality of its Jimbour<sup>®</sup> parentage.

### SEED PROTECTION & ROYALTIES

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

An End Point Royalty (EPR) of \$4.40 per tonne (GST inclusive), which includes breeder royalties, applies upon delivery of this variety.

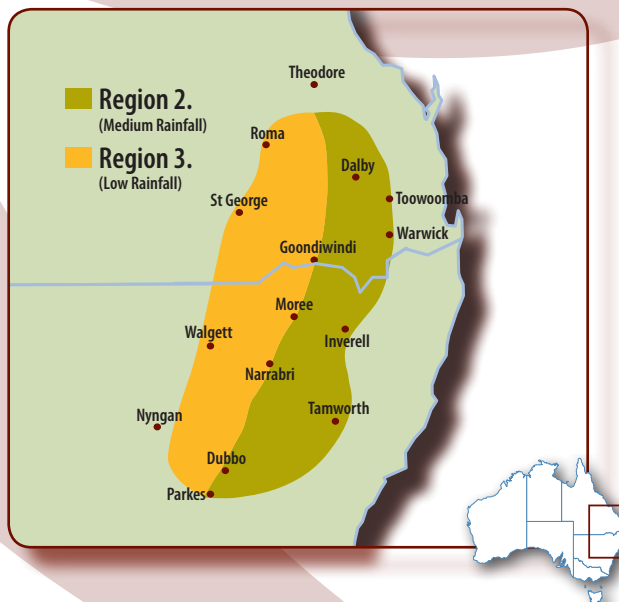
Seed is available from the commercial partner Seednet.

**Seednet**  
Planting Productivity

### KEY FEATURES

- Moderately Resistant/Resistant (MR/R) to Ascochyta blight (resistance is > Flipper<sup>®</sup> but < PBA Boundary<sup>®</sup>).
- Moderately Resistant (MR) to Phytophthora root rot (resistance is > Jimbour<sup>®</sup> but < Yorker<sup>®</sup>).
- High yielding across all chickpea growing regions of Northern NSW and Southern Qld.
- Tall, erect plant type (similar to Jimbour<sup>®</sup> and Kyabra<sup>®</sup>).
- Mid-season maturity (equivalent to Jimbour<sup>®</sup> and Kyabra<sup>®</sup>).
- Medium sized desi seed suited to the direct human consumption market.
- Excellent milling quality.

### AREA OF ADAPTATION



### YIELD & ADAPTATION

PBA HatTrick<sup>®</sup> is well adapted to all areas of Region 2 (Central/North-Western Slopes 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. Yields are similar to Jimbour<sup>®</sup> and Kyabra<sup>®</sup> and generally much higher than Flipper<sup>®</sup> and Yorker<sup>®</sup>.

PBA HatTrick<sup>®</sup> is not recommended for Central Qld where yields are lower than those of the established varieties. As part of the Ascochyta blight management program for Central Qld an industry moratorium prevents the movement of seed from Regions 2 & 3 into Central Qld. PBA HatTrick<sup>®</sup> is not recommended for Southern NSW, Victoria, South Australia or Western Australia.

#### Yield of desi chickpea varieties in north-eastern Australia

Variety	Averaged yields for Regions R2 & R3 expressed as a % of PBA HatTrick <sup>®</sup> yield										Sth NSW	
	2010		2009		2008		2007		2006		2003-2010	
	R2	R3	R2	R3	R2	R3	R2	R3	R2	R3	R4	R5
PBA HatTrick <sup>®</sup> (t/ha)	2.12	2.28	1.78	1.56	2.14	1.96	1.27	1.10	1.86	1.68	1.23	1.69
PBA HatTrick <sup>®</sup>	100	100	100	100	100	100	100	100	100	100	100	100
PBA Boundary <sup>®</sup>	109	104	104	102	109	105	106	106	106	109	105	105
Jimbour <sup>®</sup>	72	78	104	103	99	96	103	102	102	102	96	-
Kyabra <sup>®</sup>	78	72	106	105	99	96	105	104	106	-	-	-
Flipper <sup>®</sup>	95	86	97	92	96	90	97	86	96	89	92	94
Yorker <sup>®</sup>	88	98	100	96	98	89	92	88	94	91	96	-
PBA Slasher <sup>®</sup>	-	-	-	-	-	-	-	-	-	-	110	111

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

Region 2 (R2) Central/North-Western Slopes (NSW) and Darling Downs (Qld).

Region 3 (R3) Central/North-Western Plains (NSW) and Western Downs/Maranoa (Qld).

Region 4 (R4) Southern NSW Medium/High rainfall east of the Newell Hwy

Region 5 (R5) Southern NSW Low/Medium rainfall west of the Newell Hwy

#### 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)		% Yield loss		Resistance rating	Yield (t/ha) <sup>3</sup>	% Yield loss
		2009 <sup>3</sup>	2010 <sup>3</sup>	2009	2010			
PBA HatTrick <sup>®</sup>	MR/R	1.71	1.71	8	34	MR	1.06	62
PBA Boundary <sup>®</sup>	R/MR	1.84	2.32	4	4	MS	0.90	68
Jimbour <sup>®</sup>	S	0.44	0.00	77	100	MS/MR	0.88	68
Kyabra <sup>®</sup>	S	-	0.00	-	100	MS	-	-
Flipper <sup>®</sup>	MR	1.69	-	9	-	MS	-	-
Yorker <sup>®</sup>	MS	1.80	-	5	-	MR	1.42	50
PBA Boundary <sup>®</sup> disease free		1.91	2.41	-	-		2.77	-

Source: NSW-DPI and Qld DEEDI Plant Pathology teams.

<sup>1</sup> Ascochyta blight yield loss trial, Tamworth 2009 & 2010 - NSW-DPI

<sup>2</sup> Phytophthora root rot yield loss trial, Warwick 2009 - DEEDI and NSW-DPI.

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

#### Agronomic traits of desi chickpea in north-eastern Australia

Variety	Flowering score <sup>#</sup>	Maturity score <sup>#</sup>	Plant height (cm)	Lodging score <sup>##</sup>
PBA HatTrick <sup>®</sup>	4.6	5.1	53	2.0
PBA Boundary <sup>®</sup>	5.5	5.0	55	2.0
Jimbour <sup>®</sup>	4.8	5.1	52	1.6
Kyabra <sup>®</sup>	4.4	5.1	54	1.4
Flipper <sup>®</sup>	6.5	6.3	54	1.3
Yorker <sup>®</sup>	5.8	6.0	48	1.7

Source: Pulse Breeding Australia trials program 2004-2010.

<sup>#</sup> 1 = very early; 9 = very late.

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

## DISEASE MANAGEMENT

### Ascochyta blight (AB)

*Follow the general guidelines for reducing the risk of Ascochyta blight in 'Winter Crop Variety Sowing Guide' from NSW-DPI or 'Chickpea: Ascochyta Blight Management' from Pulse Australia*

- PBA HatTrick<sup>®</sup> represents a significant improvement in Ascochyta resistance compared to other desi varieties currently grown in the target regions of Northern NSW and Southern Qld.
- Its Moderately Resistant/Resistant (MR/R) Ascochyta rating means that disease development will be slow and there will be no or minimal yield loss in most seasons.
- In most seasons there is no cost benefit in applying a fungicide before Ascochyta is detected.
- However, in seasons of high disease pressure, a reactive foliar fungicide spray strategy may be warranted and at least one pod protection spray is likely to be required.
- Monitor the crop 10-14 days after each rain event and if Ascochyta is detected consult your agronomist.

### Phytophthora root rot (PRR)

- PBA HatTrick<sup>®</sup> is Moderately Resistant (MR) to Phytophthora. It is slightly more resistant than Jimbour<sup>®</sup> and Kyabra<sup>®</sup> and slightly less resistant than Yorker<sup>®</sup>.
- The resistance means that production losses will be significantly reduced compared to those of Susceptible (S) varieties. However, losses can still occur under conditions that are highly conducive to Phytophthora.
- Appropriate paddock selection will minimise disease risk (e.g. avoid poorly drained areas and paddocks with a history of Phytophthora; ensure at least a two year break).

### Botrytis grey mould (BGM)

- Controlled environment testing, confirmed by opportunistic field testing in 2010, indicates that PBA HatTrick<sup>®</sup> is Susceptible (S) to BGM, broadly similar to all other regional desi varieties, except for Jimbour<sup>®</sup> which is rated Moderately Susceptible (MS).
- Monitor for BGM in spring as temperatures and humidity rise. Apply a registered fungicide containing either carbendazim or mancozeb once BGM has been identified within the crop.

### Virus

- PBA HatTrick<sup>®</sup> is rated Moderately Susceptible (MS) to the suite of viruses that affect chickpea, similar to other commonly grown desi 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 such as the Liverpool Plains.
- There is no evidence to support the use of seed or foliar insecticides to reduce losses caused by viruses in chickpea.

## AGRONOMY

### Plant characteristics

PBA HatTrick<sup>®</sup> is similar in appearance to one of its parents Jimbour<sup>®</sup>. It has a tall, erect plant type with pods held well above the ground. Under high yielding situations it has exhibited a slightly increased tendency to lodge, although this is not considered a significant problem. Flowering and harvest maturity are similar to Jimbour<sup>®</sup> and Kyabra<sup>®</sup>, and significantly earlier than Flipper<sup>®</sup> and Yorker<sup>®</sup>.

### Sowing

- Target the optimum planting window for your area, but avoid very early sowing.
- Sow high quality seed at rates calculated to achieve a plant population of 25-30 plants/m<sup>2</sup>. Typically 50 to 65 kg/ha, depending upon germination percentage and planting conditions.
- Inoculate with Group N Chickpea Rhizobium.

### Tolerance of physical stresses

- Moderately intolerant of salt (same as Flipper<sup>®</sup> and Kyabra<sup>®</sup>; more tolerant than Jimbour<sup>®</sup>; less tolerant than Yorker<sup>®</sup>).
- The tolerance of PBA HatTrick<sup>®</sup> to label recommended rates of registered herbicides is similar to Jimbour<sup>®</sup> based on visual observations from three years of trials conducted on calcareous alkaline soils in South Australia. Widespread field evaluation in the Northern Region has found no increased sensitivity over other commonly grown varieties to registered herbicides provided label directions are complied with.
- There is no evidence of increased sensitivity to frost compared to other varieties.

# PBA HatTrick<sup>®</sup>

## Desi Chickpea

### SEED QUALITY

PBA HatTrick<sup>®</sup> is a standard 'Indian' type desi chickpea.

Seed size, shape and seed coat texture are very similar to Jimbour<sup>®</sup>, whereas colour is slightly darker. Milling quality is excellent, giving dhal yields 1-2% higher than other varieties commonly grown in north-eastern Australia.

The dhal is similar in shape and size to that of Jimbour<sup>®</sup> and has the distinct dimpling required by Indian markets to differentiate it from field pea dhal.

Variety	Seed weight (g/100)	Dhal yield (%)
PBA HatTrick <sup>®</sup>	20.1	65.1
PBA Boundary <sup>®</sup>	19.5	64.7
Jimbour <sup>®</sup>	19.8	64.2
Kyabra <sup>®</sup>	25.3	64.9
Flipper <sup>®</sup>	18.1	62.4
Yorker <sup>®</sup>	21.2	62.9

Source: Pulse Breeding Australia



PBA HatTrick<sup>®</sup>



Jimbour<sup>®</sup>

### MARKETING

PBA HatTrick<sup>®</sup> has been assessed by traders in India and considered suitable for both direct consumption and splitting end uses.

### BREEDING

PBA HatTrick<sup>®</sup> (evaluated as CICA0512) was developed by the PBA desi chickpea program, led by NSW-DPI from a cross between Jimbour<sup>®</sup> and the Ascochyta resistant Iranian landrace ICC14903.

### PATHOLOGY

Disease management information has been compiled from experiments conducted by NSW-DPI through the GRDC project DAN00110 'More Profitable Chickpeas through Disease Management and Disease Screening - Northern Region' and by DEEDI through the GRDC project DAQ00108 'Reducing the Impact of Pulse Diseases in the Northern Region'.



## Better pulse varieties faster

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.

### 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

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