

# 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 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.

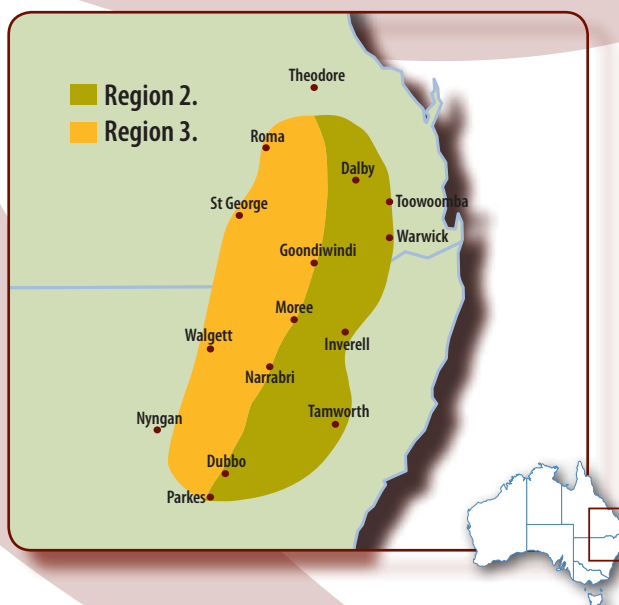
Seed is available from the commercial partner AWB Seeds.

**AWB Seeds**

### KEY FEATURES

- Moderately Resistant/Resistant (MR/R) to ascochyta blight (> Flipper<sup>®</sup>).
- Moderately Resistant (MR) to phytophthora root rot (> 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>/Kyabra<sup>®</sup>).
- Mid-season maturity (equivalent to Jimbour<sup>®</sup>/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 Jimbour's yield									
	2008		2007		2006		2005		2004	
	R2	R3	R2	R3	R2	R3	R2	R3	R2	R3
PBA HatTrick <sup>®</sup> (t/ha)	2.15	1.96	1.27	1.08	1.85	1.68	1.82	1.78	2.23	1.22
PBA HatTrick <sup>®</sup>	101	105	98	97	97	99	106	99	101	101
Jimbour <sup>®</sup>	100	100	100	100	100	100	100	100	100	100
Kyabra <sup>®</sup>	100	100	102	101	103	101	98	98	98	-
Flipper <sup>®</sup>	97	94	94	82	92	88	99	87	91	92
Yorker <sup>®</sup>	99	93	90	83	89	93	95	92	98	95

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

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

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

#### 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)	% Yield loss
PBA HatTrick <sup>®</sup>	MR/R	2.31	7 (ns)	MR	0.82	60
Jimbour <sup>®</sup>	S	0.02	99	MR/MS	0.86	63
Kyabra <sup>®</sup>	S	0.00	100	MR/MS	-	-
Flipper <sup>®</sup>	MR	1.98	21	MR/MS	-	-
Yorker <sup>®</sup>	MR/MS	1.63	39	MR	0.91	57
PBA HatTrick <sup>®</sup> disease free		2.48			2.12	

**Source:** I&I NSW and QPIF Plant Pathology teams.

<sup>1</sup> Yield loss trial, Tamworth, 2008 - I&I NSW. ns = not significant (P=0.05).

<sup>2</sup> Mean data from yield loss trials, Warwick, 2007 & 08 - I&I NSW and QPIF.

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

Variety	Flowering score <sup>#</sup>	Maturity score <sup>#</sup>	Plant height (cm)	Lowest pod height (cm)	Lodging score <sup>**</sup>
PBA HatTrick <sup>®</sup>	4.7	5.1	54	33	2.5
Jimbour <sup>®</sup>	4.8	5.1	53	33	2.0
Kyabra <sup>®</sup>	4.5	5.0	54	35	1.7
Flipper <sup>®</sup>	6.4	6.4	54	34	1.7
Yorker <sup>®</sup>	5.8	6.3	49	30	2.2

**Source:** PBA (Pulse Breeding Australia) trials.

<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 in 'Winter Crop Variety Sowing Guide' from Industry & Investment NSW or 'Chickpea Disease Management - Northern Region' 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.
- There is no cost benefit in applying a fungicide before ascochyta is detected.
- In years of high disease pressure, a reactive foliar fungicide 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 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)

- There has been no opportunity to assess the reaction of PBA HatTrick<sup>®</sup> to BGM under field conditions. However, controlled environment testing suggests that it has a Susceptible (S) reaction, broadly similar to that of other northern varieties except for Jimbour<sup>®</sup> which is rated Moderately Susceptible (MS).
- Monitor for BGM in spring as temperatures and humidity rise. Apply a fungicide containing either carbendazim or mancozeb once BGM has been positively identified.

### 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	66.3
Jimbour <sup>®</sup>	19.9	64.8
Kyabra <sup>®</sup>	25.3	64.9
Flipper <sup>®</sup>	18.4	62.9
Yorker <sup>®</sup>	21.2	64.5

Source: PBA (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 I&I NSW from a cross between Jimbour<sup>®</sup> and the AB resistant Iranian landrace ICC14903.

### PATHOLOGY

Disease management information has been compiled from experiments conducted by I&I NSW through the GRDC project DAN00110 'More Profitable Chickpeas through Disease Management and Disease Screening - Northern Region' and by QPIF 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, QPIF, DAFWA and Pulse Australia. It aims to deliver better pulse varieties faster.

### FOR MORE INFORMATION

#### PBA

Brondwen MacLean  
GRDC  
PO Box 5367  
Kingston ACT 2604  
Ph: 02 6166 4500  
b.maclea@grdc.com.au

#### PBA Desi Chickpea

Ted Knights  
Industry & Investment NSW  
Tamworth Agricultural Institute  
4 Marsden Park Road  
Calala NSW 2340  
Ph: 02 6763 1179  
ted.knights@industry.nsw.gov.au

### SEED ENQUIRIES

#### AWB Seeds

#### National Production and Logistics Office

Corner Jeparit Rd & Western Hwy  
PO Box 17, Dimboola Vic 3414  
Ph: 03 5389 0150  
Fax: 03 5389 1121  
seedsadmin@awb.com.au  
www.awbseeds.com.au



#### Central & Southern NSW

Robert Gill  
Ph: 0428 122 465  
robert.gill@awb.com.au

#### Northern NSW & QLD

Jon Thelander  
Ph: 0429 314 909  
jon.thelander@awb.com.au

AWB Seeds mission is:

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

AWB Seeds is proud to partner with Pulse Breeding Australia and invest in the improvement of Australian desi chickpea varieties.

### AGRONOMIC ENQUIRIES

#### Central New South Wales

Ted Knights, I&I NSW, Ph: 02 6763 1179  
Kevin Moore, I&I NSW, Ph: 02 6763 1133  
Gordon Cumming, Pulse Australia, Ph: 0408 923 474

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Ted Knights, I&I NSW, Ph: 02 6763 1179  
Kevin Moore, I&I NSW, Ph: 02 6763 1133  
Gordon Cumming, Pulse Australia, Ph: 0408 923 474

#### Southern Queensland

Col Douglas, QPIF, Ph: 07 4660 3613  
Malcolm Ryley, QPIF, Ph: 07 4688 1316  
Gordon Cumming, Pulse Australia, Ph: 0408 923 474

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