

PBA Royal[®]

Medium Kabuli Chickpea



PBA

PULSE BREEDING AUSTRALIA

Better pulse varieties faster

The information in this document is current as at September 2019. For updated information after this date, please refer to NVT results.

High yielding kabuli chickpea



MAIN ADVANTAGES

PBA Royal[®] is a high yielding medium sized kabuli chickpea. It is particularly well adapted to the medium rainfall chickpea growing regions of south eastern Australia. In these regions, it has improved grain yields in mid to high yielding environments (greater than 1.5 t/ha) compared to Genesis™090, PBA Monarch[®] and Genesis™Kalkee. In the northern region, PBA Royal[®] has higher yields than PBA Monarch[®] across a range of yield groups (1.0 to 4.0 t/ha). PBA Royal[®] has seed size greater than Genesis™090 but smaller than PBA Monarch[®].

SEED PROTECTION & ROYALTIES

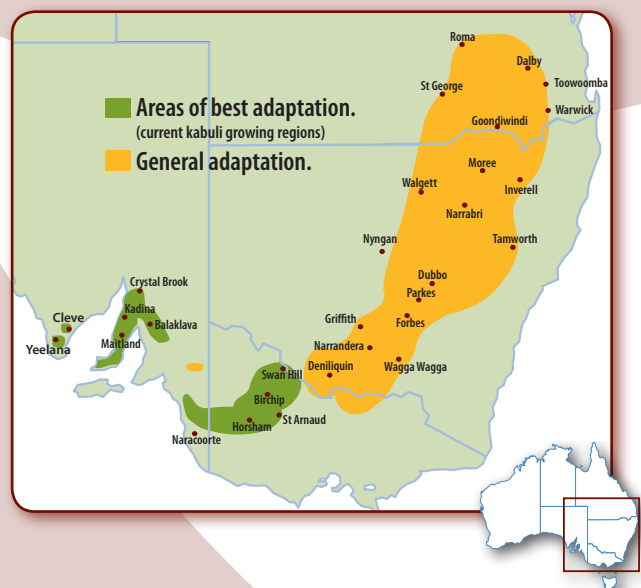
PBA Royal[®] is protected under Plant Breeder's rights (PBR) legislation. Growers can only retain seed from their production of PBA Royal[®] for their own use.

An end point royalty (EPR) of \$7.15 per tonne (GST inclusive), which includes breeder royalties, applies upon delivery of this variety. Seed is available from the commercial partner Seednet.

KEY FEATURES

- Highest yielding medium sized kabuli chickpea in mid to high yield potential environments (greater than 1.5 t/ha) in all kabuli growing areas of Australia
- Predominantly 8 mm (larger than Genesis™090)
- Rated as moderately susceptible to Ascochyta blight (same as Genesis™090) in the southern GRDC cropping region and moderately resistant to Ascochyta blight in the northern GRDC cropping region
- Early to mid-flowering and maturity
- Semi spreading plant type similar to Genesis™090

AREA OF ADAPTATION



YIELD & ADAPTATION

In south eastern Australia, PBA Royal[®] is the highest yielding kabuli in mid to high yielding environments (1.5 – 2.5 t/ha). PBA Royal[®] has performed particularly well in the Mid North of South Australia and Wimmera of Victoria.

In the northern GRDC region, PBA Royal[®] has higher yields than PBA Monarch[®] across a range of yield groups (1.0 to 4.0 t/ha). For yield data relevant to your region, please visit NVT Online, <https://app.nvtonline.com.au>.

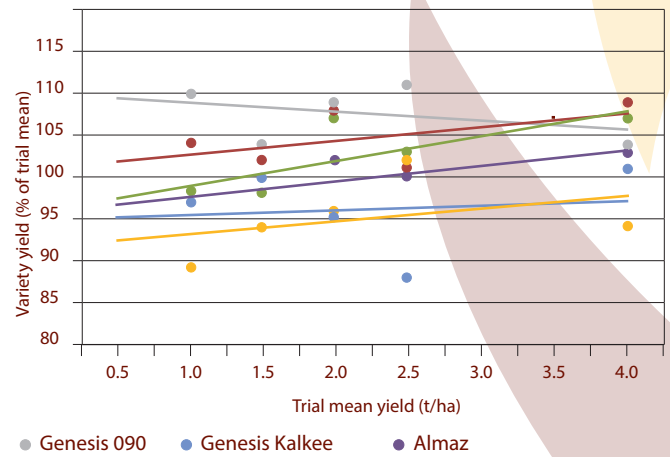
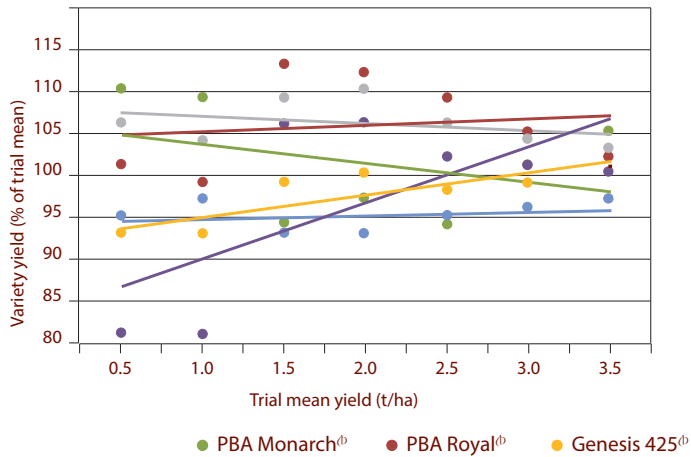


Figure 1. Average relative yield of PBA Royal[®] and other kabuli varieties (2014–18), compared to the average trial yield, in Victorian and South Australian Stage 3 and NVT trials across a range of yield groups.

Figure 2. Average relative yield of PBA Royal[®] and other kabuli varieties (2014–18), compared to the average trial yield, in northern New South Wales and Queensland Stage 3 and NVT trials across a range of yield groups.

Source: Trial results from Pulse Breeding Australia (PBA) and National Variety Trials (NVT) programs. Data sourced from NVT Online, <https://app.nvtonline.com.au>

DISEASE MANAGEMENT

Ascochyta blight (AB)

- In the southern GRDC region, PBA Royal[®] is rated moderately susceptible (MS) to foliar infections, similar to Genesis™ 090.
- In the northern GRDC region, PBA Royal[®] is rated moderately resistant (MR) to foliar infections.
- A registered seed dressing for the control of Ascochyta blight is highly recommended to protect against seed transmitted Ascochyta blight.

Disease resistance rating and AB yield loss of kabuli chickpea

Variety	Botrytis grey mould (BGM) resistance rating	Phytophthora root rot (PRR) resistance rating	Ascochyta blight (AB)			Yield under very high disease (AB) pressure t/ha		
			Foliage / Stem		Pods	Fungicide treatment		
			South	North		F/nightly	Nil	Yield loss %
PBA Royal [®]	S*	VS*	MS*	MR*	S*	3.87	2.85	26
Almaz	S	VS	MS	MR/MS	S	3.67	2.02	45
Genesis™ Kalkee	S	VS	MS	MR/MS	S	3.21	2.31	45
Genesis™ 090	S	VS	MS	MR	S	3.42	2.22	39
Genesis™ 425	S	S	MR	S	S			
PBA Monarch [®]	S	VS	MS	S	S	3.48	0.72	79

*Provisional disease rating.

Source disease ratings: Agriculture Victoria, SARDI, NSW DPI and DAF Q pathology and PBA teams.

Source of yield loss data: PBA, Horsham Victoria 2016, LSD for interaction (P<0.001) = 0.48

- All chickpea crops will require timely foliar fungicide applications as per label directions to minimise the impact of Ascochyta blight.
- Like all varieties, PBA Royal[®] is more susceptible to pod infection than foliar infection hence will also require protection prior to rain events during podding to prevent seed staining and abortion.
- Abiotic spotting on leaves and stems can be confused with Ascochyta blight. Abiotic spots are often small, and create a regular pattern on leaves and or stems. No disease has been associated with this feature, and no management is required. If unsure, contact your state based pulse pathologist for diagnostics.

Botrytis grey mould (BGM)

- PBA Royal[®] is susceptible (S) to BGM.
- Early sowing coupled with favourable growth conditions in spring can lead to crops with large biomass. High biomass crops are more prone to lodging which increases the BGM risk. Under these conditions, PBA Royal[®] can also be prone to lodging like other kabuli varieties.
- Apply a preventative fungicide prior to canopy closure in high risk BGM situations ie high biomass and average temperature of 15 °C and above and high humidity. BGM is rare in the southern GRDC region.

Phytophthora root rot (PRR)

- PBA Royal[®] is very susceptible (VS) to PRR.
- Avoid paddocks that have: a) PRR in previous chickpea or lucerne crops; b) history of lucerne or medics; c) areas prone to waterlogging.

Virus

- PBA Royal[®] is susceptible (S) to the suite of viruses, similar to other kabuli varieties.
- Planting into paddocks with standing cereal (or other crop) stubble, timely sowing and successful establishment of a uniform recommended plant population (see below) provide the most effective management in virus-prone districts.

AGRONOMY

Agronomic characteristics

Paddock selection and agronomic requirements for growing PBA Royal[®] are similar to those for other kabuli varieties. PBA Royal[®] has the following characteristics:

- Early to mid-flowering, approximately 3 days earlier than Genesis™090 but later than PBA Monarch[®].
- Mid maturing, similar to Genesis™090 but later than PBA Monarch[®].
- Plant height and lowest pod height are slightly higher than Genesis™090 but lower than Genesis™Kalkee.
- Lodging resistance is similar to Genesis™090.
- Semi-spreading plant type similar to Genesis™090.
- Intolerant of salt, similar to PBA Monarch[®].

Sowing

- Target the optimum planting window for kabuli chickpeas in your area. Be aware that early sowing can lead to excess biomass and increases the risk of lodging.
- PBA Royal[®] is prone to lodging when sown on wide (>50 cm) row spacing.
- Sow high quality seed at rates calculated to establish 25 to 35 plants/m².
- Treat seed with a registered fungicide seed treatment.
- Inoculate with Group N Chickpea rhizobium.

Herbicide tolerance

- PBA Royal[®] has performed similarly to Genesis™090 to most registered pre- and post-emergent herbicides when applied at recommended rates in herbicide tolerance screening nurseries on alkaline soils in South Australia.

Agronomic traits of kabuli chickpea

Variety	Early vigour	Flowering	Maturity	Plant height	Lodging resistance
PBA Royal [®]	Moderate	Early–Mid	Mid	Medium	MR
Almaz	Moderate	Mid	Mid–Late	Medium–Tall	MR
Genesis™Kalkee	Good	Mid–Late	Late	Tall	R
Genesis™090	Good	Mid	Mid	Medium	MR
Genesis™425	Mod–Good	Mid	Mid	Medium	MR
PBA Monarch [®]	Poor–Mod	Early	Early	Medium	MS

Source: Pulse Breeding Australia

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

SEED QUALITY

PBA Royal[®] is a medium seeded (predominantly 8 mm) kabuli chickpea. It has a light cream-beige seed coat which has a defined kabuli seed shape with good wrinkling characteristics. It is larger in size than Genesis[™]090 but smaller than PBA Monarch[®] and Genesis[™]Kalkee.

Variety	Seed weight (g/100)	Seed size (%)				
		10 mm	9 mm	8 mm	7 mm	6 mm
PBA Royal [®]	38.8	0	24.5	58.2	16.6	0.6
Almaz [®]	39.7	0.2	25.5	40.1	30.8	3.1
Genesis [™] Kalkee	41.5	0.8	0.8	33.7	50.4	14.3
Genesis [™] 090	32.8	0	1.5	44.4	52.7	1.3
Genesis [™] 425	31.6	0	1.7	43.3	52.6	2.2
PBA Monarch [®]	39.7	0.2	25.6	46.0	25.4	2.8

Source: Pulse Breeding Australia
Data is average of 6 sites, southern (4 sites) and northern (2 sites) Australia across 2 years (2016-17)

MARKETING

Favourable feedback on the seed quality of PBA Royal[®] by both domestic and international traders has been received.



PBA Royal[®]



PBA Monarch[®]



Genesis[™] 090

BREEDING

PBA Royal[®] (evaluated as CICA1156) was developed by the PBA chickpea breeding program (led by NSW DPI) from a cross between Genesis[™]079 and FLIP97-530C.

PULSE AGRONOMY

Agronomy and disease management information has been developed with the assistance of the 'Southern region pulse agronomy project' a co-investment by GRDC, Agriculture Victoria and SARDI, and previously 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 kabuli chickpea varieties.

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