

PBA Drummond[®]

Desi Chickpea (Central Qld ONLY)



PBA

PULSE BREEDING AUSTRALIA

Better pulse varieties faster

High yielding desi chickpea



MAIN ADVANTAGES

PBA Drummond[®] is an improved desi chickpea for Central Queensland with significantly higher grain yield than all current varieties in this region. It has an improved level of Ascochyta blight resistance over current high yielding, susceptible varieties such as PBA Pistol[®], Kyabra[®] and Moti[®].

PBA Drummond[®] is an excellent agronomic package with good harvestability. It is tall, erect and lodging resistant and has been in advanced yield evaluation since 2013 in a diverse range of seasonal conditions. PBA Drummond[®] has acceptable seed quality similar to PBA HatTrick[®] and equivalent dhal milling yield to current varieties.

SEED PROTECTION & ROYALTIES

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

An end point royalty (EPR) of \$4.95 per tonne (GST inclusive), which includes breeder royalties, applies upon delivery of this variety.

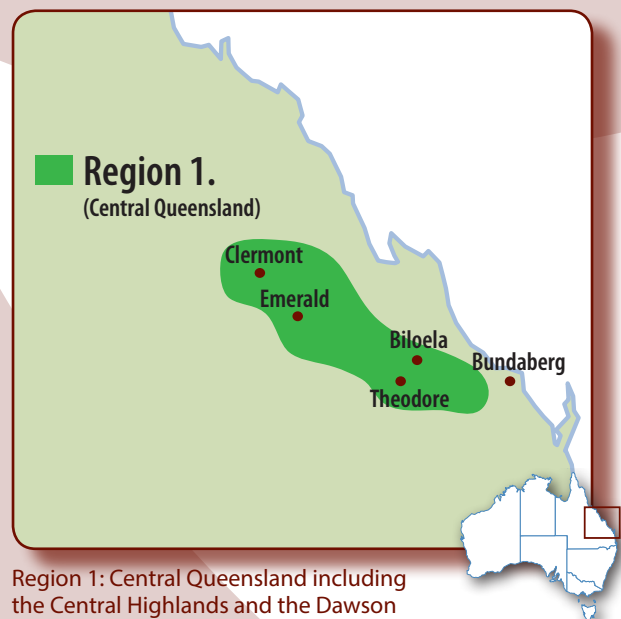
Seed is available from the commercial partner Seednet.

Seednet
Planting Productivity

KEY FEATURES

- Consistently high yielding across all areas of Central Queensland
- Ascochyta blight resistance better than PBA Pistol[®], Kyabra[®] and Moti[®] but not as good as PBA HatTrick[®]
- Tall, erect plant type
- Mid-Flowering and Early-Mid Maturity
- Medium sized desi seed suited to export markets

AREA OF ADAPTATION



Region 1: Central Queensland including the Central Highlands and the Dawson Callide valleys.

YIELD & ADAPTATION

PBA Drummond[®] is well adapted to all areas of Central Queensland (Region 1) where chickpeas are currently grown. Overall CQ yield averages from within Pulse Breeding Australia and National Variety Trials has shown PBA Drummond[®] to be 7%, 8% and 10% higher yielding than PBA Pistol[®], Kyabra[®] and PBA Seamer[®], respectively. Yield performance data has been obtained from 17 sites representing 5 diverse seasons from 2013–2017. PBA Drummond[®] is in NVT/Stage 3 yield trials in southern QLD and northern NSW in 2018 and yield data will be available at www.nvtonline.com.au

PBA Drummond[®] 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)

Follow the general guidelines for reducing the risk of Ascochyta in 'Central & Coastal Queensland Ascochyta Blight Management' available from Pulse Australia.

- Results from yield loss trials and screening nurseries demonstrate that PBA Drummond[®] has better Ascochyta resistance than PBA Pistol[®], Kyabra[®] and Moti[®] but not as good as PBA HatTrick[®] (MS) or the best available resistance level in PBA Seamer[®] (MR).
- In most seasons in CQ, there will be no cost benefit of applying a fungicide before Ascochyta is detected.
- However, when conditions favour Ascochyta, a reactive foliar fungicide program and protective pod sprays are warranted. Monitor the crop 10–14 days after each rain event and if Ascochyta is detected, consult your agronomist.

Yield of desi chickpea in the Dawson Callide

| Variety | Dawson Callide ¹ | Yield as a % of PBA Pistol [®] and, in brackets, yield in t/ha | | | | | | |
|---------------------------------|-----------------------------|---|-------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| | | 5/6/13* | 28/4/14* | 18/5/15* | 29/4/15* | 22/5/16* | 29/5/17* | 17/5/17* |
| Nearest town | | Biloela | Banana | Jambin | Banana | Jambin | Jambin | Theodore |
| Row spacing (m) | | 1.0 | 1.0 | 0.72 | 1.0 | 0.72 | 0.5 | 0.5 |
| PBA Drummond[®] | 107 | 96 (2.19) | 114 (2.37) | 88 (2.18) | 104 (3.40) | 112 (3.52) | 104 (2.04) | 121 (2.46) |
| PBA Pistol [®] | 100 | 100 (2.27) | 100 (2.08) | 100 (2.49) | 100 (3.28) | 100 (3.13) | 100 (1.97) | 100 (2.03) |
| Kyabra [®] | 98 | 89 | 107 | 106 | 98 | 98 | 97 | 104 |
| PBA Seamer [®] | 97 | 91 | 106 | 105 | 93 | 105 | 99 | 115 |
| Moti [®] | 101 | – | 108 | 106 | 91 | 104 | 101 | 104 |
| PBA HatTrick [®] | 94 | 80 | 91 | 99 | 88 | 96 | 90 | 97 |
| PBA Boundary [®] | 97 | 87 | 106 | 107 | 89 | 98 | – | – |
| Probability, LSD (t/ha) | | <0.001, 0.21 | <0.001, 0.23 | 0.0579, 0.28 | <0.001, 0.18 | <0.001, 0.29 | 0.0176, 0.22 | <0.001, 0.25 |

Yield of desi chickpea in the Central Highlands

| Variety | Central H'lands ¹ | Yield as a % of PBA Pistol [®] and, in brackets, yield in t/ha | | | | | | | | | |
|---------------------------------|------------------------------|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|-------------------|-------------------|
| | | 15/5/13* | 1/6/13* | 7/5/14* | 8/5/14* | 15/5/14* | 6/5/15* | 13/5/16* | 25/5/16* | 31/5/16* | 2/6/17* |
| Nearest town | | S'sure | Emerald | Capella | S'sure | Emerald | Emerald | S'sure | Emerald | Capella | Emerald |
| Row spacing (m) | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.5 | 0.5 | 0.5 | 0.5 |
| PBA Drummond[®] | 109 | 104 (2.34) | 123 (3.33) | 113 (2.21) | 107 (2.25) | 101 (2.72) | 101 (1.82) | 114 (3.02) | 92 (3.5) | 108 (2.19) | 100 (3.02) |
| PBA Pistol [®] | 100 | 100 (2.26) | 100 (2.71) | 100 (1.96) | 100 (2.1) | 100 (2.69) | 100 (1.8) | 100 (2.65) | 100 (3.79) | 100 (2.03) | 100 (3.03) |
| Kyabra [®] | 100 | 96 | 110 | 106 | 110 | 100 | 94 | 95 | 97 | 96 | 96 |
| PBA Seamer [®] | 97 | 97 | 105 | 99 | 105 | 101 | 99 | 94 | 99 | 95 | 98 |
| Moti [®] | 101 | 98 | – | 108 | 110 | 103 | 101 | 100 | 97 | 100 | 92 |
| PBA HatTrick [®] | 94 | 84 | 100 | 94 | 93 | 86 | 90 | 90 | 92 | 94 | 80 |
| PBA Boundary [®] | 98 | – | 97 | 98 | 95 | 89 | 97 | 92 | – | – | – |
| Probability, LSD (t/ha) | | 0.0517, 0.22 | <0.001, 0.24 | <0.001, 0.21 | 0.0013, 0.21 | <0.001, 0.43 | <0.001, 0.16 | <0.001, 0.28 | <0.001, 0.19 | <0.001, 0.24 | <0.001, 0.28 |

Source: Trial results from Pulse Breeding Australia (PBA) and National Variety Trial (NVT) programs (www.nvtonline.com.au).

* Sowing date

¹ Calculated by averaging the year group from the NVT online long term yield app for 5 Dawson Callide sites and 11 Central Highlands sites 2013–2017

Botrytis grey mould (BGM)

- PBA Drummond[®] is rated as Susceptible (S) to BGM.
- 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 current registered fungicide once BGM has been identified within the crop and before full canopy closure.
- Managing row spacing and sowing time can assist with risk levels.

Virus

- PBA Drummond[®] is rated as Moderately Susceptible (MS) to the major chickpea viruses, similar to other varieties. This is based on limited data due to less than conducive virus years.

AGRONOMY

Agronomic characteristics

- PBA Drummond[®] flowers a few days later than PBA Pistol[®], Kyabra[®] and PBA Seamer[®].

Sowing

- Target the optimum planting window (last 3 weeks in May and 1st week in June for CQ) and avoid very early sowing to minimise the risk of lodging.
- Sow high quality seed at rates calculated to achieve 25 plants/m² establishment. Typically 60 to 75 kg/ha depending upon germination percentage, vigour and planting conditions.
- PBA Drummond[®] is able to be deep sown similarly to other PBA varieties.
- Inoculate with Group N Chickpea rhizobial inoculum.

Tolerance of abiotic stresses

- PBA Drummond[®] had lower vegetative frost damage than PBA Pistol[®] and Kyabra[®] at Warwick in 2016.

Herbicide tolerance

- PBA Drummond[®] has performed similarly to PBA HatTrick[®] to most registered pre- and post-emergent herbicides applied at recommended rates in screening nurseries on alkaline soils in SA.
- Avoid shallow planting depths and leaving open trench slots, particularly if rain is possible.

Agronomic traits of desi chickpea in Central Queensland

| Variety | Flowering (Flowering score ¹) | Maturity (Maturity score ¹) | Plant height (cm) (Erectness) | Lowest pod height (cm) | Lodging resistance (Lodging score ²) | Frost score ³ |
|---------------------------|---|---|-------------------------------|------------------------|--|--------------------------|
| PBA Drummond [®] | Mid (6.7) | Early-Mid (4.7) | 67.4 (E) | 34.5 | Good (3.3) | 3.2 |
| PBA Pistol [®] | Early (3.5) | Early (3.5) | 75.7 (E) | 35.7 | Good (3.5) | 7.6 |
| Kyabra [®] | Early-Mid (5.0) | Early-Mid (4.6) | 66.4 (E) | 35.2 | Good (4.2) | 4.2 |
| PBA Seamer [®] | Early-Mid (5.7) | Early-Mid (4.6) | 65.4 (Semi-E) | 34.2 | Good (3.2) | 3.5 |
| Moti [®] | Early-Mid (-) | Early-Mid (3.9) | 67.2 (E) | 36.2 | Good (3.0) | - |
| PBA HatTrick [®] | Mid (6.1) | Mid (5.4) | 63.2 (E) | 34.1 | Moderate (5.2) | - |
| PBA Boundary [®] | Mid (6.7) | Mid (5.2) | 68.4 (E) | 37.2 | Moderate (4.6) | - |

Source: Pulse Breeding Australia 2013–2017

1 Flower & Maturity score: 1 = very early, 9 = very late

2 Lodging score: 1 = fully erect, 9 = flat on ground

3 Frost score (post flowering): 1=low damage, 9=high damage. Frost data collected from Warwick, SQld 2016 (DAQ00193)

Disease resistance rating and yield loss of desi chickpea in north-eastern Australia

| Variety ¹ | Ascochyta blight (AB) ² | | | | | | | Phytophthora root rot (PRR) ⁵ | | |
|---------------------------|------------------------------------|-------------------------|------|------|--------------|------|------|--|-------------------------|------|
| | AB Resistance rating ³ | Yield t/ha ⁴ | | | % Yield loss | | | PRR Resistance rating | Yield t/ha ⁴ | |
| | | 2015 | 2016 | 2017 | 2015 | 2016 | 2017 | | 2015 | 2015 |
| PBA Drummond [®] | S | 0 | 0 | 0.88 | 100 | 100 | 53 | S | 0.15 | 95 |
| PBA Pistol [®] | VS | not tested | | | | | S | not tested | | |
| Kyabra [®] | VS | 0 | 0 | 0.21 | 100 | 100 | 89 | MS | not tested | |
| PBA Seamer [®] | MR | 1.47 | 1.92 | 1.68 | 24 | 45 | 7 | MR | 0.37 | 87 |
| PBA HatTrick [®] | MS | 0.24 | 0.08 | 1.58 | 87 | 98 | 6 | MR | 0.81 | 68 |
| PBA Boundary [®] | MS | 0.91 | 1.31 | 1.53 | 53 | 70 | 12 | S | 0.17 | 94 |

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

1 PBA Pistol[®] and Moti[®] are rated VS with similar AB yield loss as Kyabra[®]

2 Ascochyta blight yield loss trial, Tamworth 2015, 2016 and 2017, NSW DPI

3 Northern Region AB Rating Scale

4 Yields are in the presence of high disease with no fungicide applications

5 Phytophthora root rot yield loss trial, Warwick 2015, NSW DPI and DAF

REFER TO DETAILED INFORMATION AT www.pulseaus.com.au
 Ute guides, crop and disease management bulletins

PBA Drummond[®]

Desi Chickpea (CQld ONLY)

SEED QUALITY

PBA Drummond[®] is a standard 'Indian' type desi chickpea with an angular seed shape and typical seedcoat colour. Seed size is comparable with PBA Seamer[®] and the majority of PBA Drummond[®] seed is retained by a 6.5 mm or 7 mm sieve. PBA Drummond[®] is smaller than PBA Pistol[®] (23.5) and Kyabra[®] (22.8) at 21.7 grams/100 seeds.

In 14 trials 2013–2016, PBA Drummond[®] had significantly less tiger stripe/blotch seed coat markings than PBA Pistol[®] and similar levels to Kyabra[®] and PBA Seamer[®].

Milling quality is equal to common varieties and the dahl is of similar colour, size and shape with the distinct dimpling required by Indian markets to differentiate it from field pea dahl. Whole seed hydration characteristics had similar properties to other varieties and hardseededness is not an issue.

| Variety | Seed weight (g/100 seeds) | Tiger/blotch marking (%) | Milling performance (%) |
|---------------------------|---------------------------|--------------------------|-------------------------|
| PBA Drummond [®] | 21.7 | 1.6 | 51.0 |
| PBA Pistol [®] | 23.5 | 5.7 | 50.7 |
| Kyabra [®] | 22.8 | 1.7 | 50.1 |
| PBA Seamer [®] | 21.5 | 1.1 | 48.6 |
| Moti [®] | 23.7 | 0.8 | – |
| PBA HatTrick [®] | 20.7 | 3.6 | 43.8 |
| PBA Boundary [®] | 20.1 | 1.3 | – |

Source: Pulse Breeding Australia.

100 Seed Weight (unsized) averaged over 15 CQ trials from 2013–2016

Seed Markings, count in 300 seeds as a %, 14 CQ trials 2013–2016 (courtesy of DAN00196)

Milling Performance % = Split Yield %, average of 2 CQ sites x 2 years (2013 and 2016)



PBA Drummond[®]



PBA Pistol[®]

MARKETING

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

BREEDING

PBA Drummond[®] (evaluated as CICA1303) was developed by the PBA chickpea breeding program (led by NSW Department of Primary Industries) from a cross between PBA HatTrick[®] and PBA Pistol[®].



Better pulse varieties faster

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.

PULSE AGRONOMY

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

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 desi chickpea varieties.

AGRONOMIC ENQUIRIES

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