**Erect, early maturing red lentil**

**KEY FEATURES**
- Early maturing red lentil
- Erect plant with the best lodging resistance of all current varieties
- Highest yield of current varieties under drought conditions
- Moderately resistant to foliar and resistant to seed ascochyta blight (AB)
- Moderately susceptible to botrytis grey mould (BGM)
- Plant type, flowering, salt and boron tolerance similar to PBA Flash
- Good replacement for PBA Flash in Mallee and northern Wimmera regions
- PBA Blitz is a better early maturing option where crop-topping is important.
- Adaptation best in cool lower rainfall areas such as the Mallee, northern Wimmera of Victoria and Upper Mid North of SA
- Medium sized red lentil (similar to Nugget and PBA Ace) with a grey seed coat and high milling quality

**AREA OF ADAPTATION**

**MAIN ADVANTAGES**
PBA Bolt is an erect, early maturing red lentil with medium sized grey seed. PBA Bolt is suited to similar areas to PBA Flash where early maturity, salinity tolerance and erect growth are keys to reliable and profitable production.

PBA Bolt has improved ascochyta blight resistance and higher yield in dry areas or years compared to PBA Flash. It is therefore better adapted to the southern Mallee, particularly where ascochyta blight needs to be controlled in PBA Flash.

PBA Bolt is moderately susceptible to Botrytis grey mould and therefore the mid maturing varieties PBA Ace, Nipper and PBA Herald XT and the early maturing variety PBA Blitz are more reliable in favourable rainfall areas of the Wimmera, Yorke Peninsula and Mid North.

**SEED PROTECTION & ROYALTIES**
PBA Bolt is protected under Plant Breeder’s Rights (PBR) legislation. A PBR bag licence applies to the seed.

Authorised growers can retain seed from their own production of PBA Bolt for their own seed use.

An End Point Royalty (EPR) of $5.50/t (including GST) applies to this variety when delivered to authorised EPR collectors.

Seed is commercialised by PBSeeds and available from 2013.
**YIELD & ADAPTATION**

PBA Bolt® has been the highest yielding early maturing variety in Victoria, WA and NSW and similar in yield to PBA Flash® in South Australia.

Its yield advantage occurs in drought years and dry areas when its erect growth habit also makes it easy to harvest. PBA Bolt® is lower yielding than PBA Ace® but will have an advantage in lower rainfall environments due to its improved harvestability, salt and boron tolerance.

PBA Bolt® has better ascochyta blight resistance than PBA Flash® making it a better option where this disease can reduce yield and quality in PBA Flash®.

PBA Bolt® also has a MS rating for BGM and therefore more resistant varieties should be grown in high yielding disease prone areas.

---

**2004-2011 LONG-TERM YIELD OF LENTIL VARIETIES** (*Yields expressed as a % of Nugget’s yield*)

<table>
<thead>
<tr>
<th>Variety</th>
<th>South Australia</th>
<th>Victoria</th>
<th>New South Wales</th>
<th>Western Australia</th>
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<td></td>
<td>Yorke P</td>
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<td>Lower EP</td>
<td>South East</td>
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<td>103</td>
<td>103</td>
<td>104</td>
<td>99</td>
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<td>102</td>
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<td>Northfield</td>
<td>94</td>
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<td>92</td>
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<td>PBA Ace</td>
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<td>112</td>
<td>114</td>
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<td>PBA Bolt</td>
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<td>113</td>
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<td>PBA Flash</td>
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<td>Nugget</td>
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<td>PBA Jumbo</td>
<td>108</td>
<td>107</td>
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<tr>
<td>Aldinga</td>
<td>98</td>
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<tr>
<td>Boomer</td>
<td>104</td>
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**AGRONOMIC AND DISEASE TRAITS OF LENTIL VARIETIES**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Vigour</th>
<th>Flower time</th>
<th>Maturity</th>
<th>Lodging resistance</th>
<th>Pod drop</th>
<th>Shattering</th>
<th>Ascochyta blight</th>
<th>Botrytis grey mould</th>
<th>Boron</th>
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<tr>
<td>PBA Bounty</td>
<td>Mod</td>
<td>Mid/Late</td>
<td>Mid</td>
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<td>R</td>
<td>R</td>
<td>MR</td>
<td>MS</td>
<td>I</td>
<td>MI</td>
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<tr>
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<td>R</td>
<td>R</td>
<td>MR</td>
<td>I</td>
<td>I</td>
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<tr>
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<td>Mid/Late</td>
<td>Mid</td>
<td>MR</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
<td>R</td>
<td>I</td>
<td>MT</td>
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<tr>
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<td>Poor/Mod</td>
<td>Mid/Late</td>
<td>Mid</td>
<td>MR</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
<td>S</td>
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<td>PBA Ace</td>
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<td>Mid</td>
<td>Mid</td>
<td>MS/MR</td>
<td>R</td>
<td>MS/MR</td>
<td>R</td>
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<td>Early</td>
<td>MS</td>
<td>MR</td>
<td>MR</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
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</tr>
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<td>Early/Mid</td>
<td>R</td>
<td>R</td>
<td>MR</td>
<td>MR</td>
<td>MS</td>
<td>MI</td>
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<td>R</td>
<td>R</td>
<td>MR</td>
<td>MS</td>
<td>MS</td>
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<td>Mid</td>
<td>Mid</td>
<td>S</td>
<td>MR</td>
<td>MR</td>
<td>MR</td>
<td>R</td>
<td>MS</td>
<td>MI</td>
</tr>
<tr>
<td>Aldinga</td>
<td>Mod</td>
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<td>Mid</td>
<td>S</td>
<td>R</td>
<td>MR</td>
<td>MS</td>
<td>MS</td>
<td>I</td>
<td>MI</td>
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<td>MR</td>
<td>MS</td>
<td>MR</td>
<td>MS</td>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>

Key: Mod=moderate, Med=medium, S=susceptible, MS=moderately susceptible, MR=moderately resistant, R=resistant, I=intolerant, MI=moderately intolerant, MT=moderately tolerant.

Data courtesy of NVT, PBA, SARDI, DPI Victoria, NSW-DPI
PBA Bolt\textsuperscript{\textregistered} is a medium red lentil variety that has been developed by Pulse Breeding Australia (PBA). This variety is targeted towards lower rainfall areas where Botrytis grey mould (BGM) and Ascochyta blight (AB) are prevalent. PBA Bolt\textsuperscript{\textregistered} is suitable for early sowing in lower rainfall areas to maximise grain yield at low risk of AB disease. It is also suitable for later sowing if necessary. Target plant densities of 120 plants/m\textsuperscript{2} adjusting sowing rates to the seed size of this variety and germination percentage of seed used each year.

**Herbicide tolerance**
- The tolerance of PBA Bolt\textsuperscript{\textregistered} to label recommended rates of registered herbicides is similar to Nugget.
- PBA Bolt\textsuperscript{\textregistered} is not an ‘XT’ variety, so it will be sensitive to imazethapyr. PBA Herald XT\textsuperscript{\textregistered} is the only current variety tolerant to imazethapyr at label rates and with improved tolerance to flumetsulam and residual levels of sulfonylurea and imidazoline herbicides.

**Crop topping and harvest**
- PBA Bolt\textsuperscript{\textregistered} matures at a similar time to PBA Flash\textsuperscript{\textregistered} but stems may remain greener in some years. Timing should be based on the seed pod and not the colour of the stems.
- As with all lentils, correct timing for crop topping, timely harvest and optimum machine setup will optimise yield and seed quality.

**Quality**

**Seed characteristics**
- PBA Bolt\textsuperscript{\textregistered} is a medium-sized lens-shaped red lentil with a grey seed coat. Seed size, as measured by 100 seed weight, is generally similar to Nugget and PBA Ace\textsuperscript{\textregistered} but smaller than PBA Blitz\textsuperscript{\textregistered}. In laboratory testing it has similar milling characteristics to other current medium size lentil varieties.

**Agronomy**

**Agronomic characteristics**
- Paddock selection and basic requirements for growing PBA Bolt\textsuperscript{\textregistered} are similar to other lentil varieties. PBA Bolt\textsuperscript{\textregistered} has the following characteristics:
- Early-mid flowering and maturing similar to PBA Flash\textsuperscript{\textregistered}. Stems of PBA Bolt\textsuperscript{\textregistered} may remain green longer than PBA Flash\textsuperscript{\textregistered} in some years. Plant height and height of pods is excellent in dry years and sites where it is most critical for efficient harvesting, and better than all other varieties.
- Resistant to lodging and has the best combination of pod drop and shattering resistance among all varieties.
- Tolerance to salinity (NaCl) is similar to PBA Bounty\textsuperscript{\textregistered} and PBA Flash\textsuperscript{\textregistered}; lower than Nipper\textsuperscript{\textregistered} but higher than all other varieties. PBA Bolt\textsuperscript{\textregistered}, PBA Flash\textsuperscript{\textregistered} and PBA Jumbo\textsuperscript{\textregistered} have moderately improved tolerance to boron over all other varieties.

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PBA Bolt
Medium red lentil

Quality assurance
Seed purity is very important in lentils with a restriction of 1% for varieties not of the same type. Prevent seed contamination when changing varieties, particularly where cotyledon or seed coat colour differs. Be particularly careful to avoid contamination of PBA Bolt® with green lentils such as Boomer® as when split the yellow seeds will contaminate and reduce the value of the red lentil split product.

For the purpose of seed cleaning PBA Bolt® has a seed size similar to Nugget.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Market category</th>
<th>Seed shape</th>
<th>Seed coat colour</th>
<th>Cotyledon colour</th>
<th>Seed size relative to Nugget</th>
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<tbody>
<tr>
<td>Small red</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PBA Bounty®</td>
<td>SRP</td>
<td>Round</td>
<td>Grey</td>
<td>Red</td>
<td>10% &lt;</td>
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<tr>
<td>PBA Herald XT®</td>
<td>SRS</td>
<td>Lens</td>
<td>Grey</td>
<td>Red</td>
<td>20% &lt;</td>
</tr>
<tr>
<td>Nipper®</td>
<td>SRP</td>
<td>Round</td>
<td>Grey</td>
<td>Red</td>
<td>20% &lt;</td>
</tr>
<tr>
<td>Northfield</td>
<td>SRP</td>
<td>Round</td>
<td>Tan</td>
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</tr>
<tr>
<td>PBA Ace®</td>
<td>MRS</td>
<td>Lens</td>
<td>Grey</td>
<td>Red</td>
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<td>Grey</td>
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<td>MRS</td>
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<td>Grey</td>
<td>Red</td>
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<tr>
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<td>MRS</td>
<td>Lens</td>
<td>Grey</td>
<td>Red</td>
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<tr>
<td>Large red</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>PBA Jumbo®</td>
<td>LRS</td>
<td>Lens</td>
<td>Grey</td>
<td>Red</td>
<td>20% &gt;</td>
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<tr>
<td>Aldinga</td>
<td>LRS</td>
<td>Lens</td>
<td>Green</td>
<td>Red</td>
<td>20% &gt;</td>
</tr>
<tr>
<td>Large green</td>
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<tr>
<td>Boomer®</td>
<td>LG</td>
<td>Lens</td>
<td>Green</td>
<td>Yellow</td>
<td>50% &gt;</td>
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</table>

Key: SRS=small red (split), SRP=small red (premium round), MRS=medium red (split), MRP=medium red (dual purpose), LRS=large red (split), LG=large green; < = seed size less than Nugget, > = seed size greater than Nugget.

MARKETING
- PBA Bolt® fits into the human food market for medium sized red lentil, particularly to be consumed whole or split. The ascochyta blight resistance of this variety will assist in achieving high grain quality from receival point to market.
- PBA Bolt® should be segregated for marketing unless otherwise stated.
- PBA Bolt® will be open marketed with an End Point Royalty, including breeders royalties, of $5.50/t (including GST) applied upon delivery.

BREEDING
PBA Bolt® (evaluated as CIPAL0801) was developed by PBA Lentils, led by DPI Victoria. It was produced by conventional plant breeding techniques from a cross between ILL7685, an erect breeding line from ICARDA, Syria, and 96-047L*99R060, an erect disease resistant PBA breeding line. It is not a genetically modified organism (non-GMO). PBA Bolt® is part of a pipeline of varieties that will be released by PBA. PBA formed a commercial partnership with PBSeeds to multiply, manage and release PBA lentil varieties. PBSeeds and PBA are delivering varieties to growers 2-4 years earlier by fast tracking the identification, multiplication, generation of information and release of new varieties. The Southern Pulse Agronomy program has been integral to the process.

THE SOUTHERN PULSE AGRONOMY PROGRAM
The Southern Pulse Agronomy program has been integral to the release of new varieties.

FOR MORE INFORMATION
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Kingston ACT 2604
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Ph: 03 5383 2213
Fax: 03 5383 2208
info@pbseeds.com.au
www.pbseeds.com.au

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VIC / SA / NSW / WA
PBSeeds - Head Office
1324 Blue Ribbon Rd
Kalkee Vic 3401
Ph: 03 5383 2213
Fax: 03 5383 2208
info@pbseeds.com.au
www.pbseeds.com.au

At PBSeeds we are leaders in the production of fine quality seed and grains. We take great care and pride in ensuring that every seed count. PBA Bolt® is now being open marketed with an End Point Royalty, including breeders royalties, of $5.50/t (including GST) applied upon delivery.

FOR MORE INFORMATION
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SOUTH AUSTRALIA
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Wayne Hawthorne, Pulse Australia, Ph: 0429 647 455

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WESTERN AUSTRALIA
Ian Pritchard, DAFWA, Ph: 08 9368 3515
Alan Meldrum, Pulse Australia, Ph: 0427 384 760

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