Improved quality faba bean

KEY FEATURES

- Adapted to high rainfall, long season regions.
- Vigorous plant with good stem strength.
- Mid to late flowering and mid maturity.
- Resistant (R) to both foliar and seed Ascochyta blight.
- Improved resistance to chocolate spot compared with Fiesta VF and Farah®.
- Very low level of Pea Seed borne Mosaic Virus (PSbMV) seed staining.
- Improved tolerance to iron deficiency chlorosis.
- Large, plump and light brown seed suited to the major Egyptian market.
- Greater yield than broad bean varieties at most high rainfall, long season sites.

MAIN ADVANTAGES

PBA Rana® represents a new grain quality category for Australian faba bean production and is not produced by any other major faba bean exporter. Its seed is larger than current faba bean varieties, and is considered to be of high quality by the major Egyptian market.

PBA Rana® is a relatively late flowering and maturing variety and is particularly suited to higher rainfall, long season faba bean production regions.

The overall disease resistance profile of PBA Rana® is superior to current Australian faba bean varieties. Including a greater level of Ascochyta blight resistance increasing the reliability of production in higher disease risk regions.

SEED PROTECTION & ROYALTIES

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

An End Point Royalty (EPR) of $3.85 per tonne (GST inclusive), which includes breeder royalties, applies upon delivery of this variety.

Seed is available from the commercial partner Seednet.

AREA OF ADAPTATION

The area of best adaptation is indicated by green shading. The green shaded areas include the central and eastern Victoria, South Australia and the northern Riverina. The area of general adaptation is also indicated by green shading. The green shaded areas include the south-western Victoria, the Lower Murray and the Riverland.
YIELD & ADAPTATION

PBA Rana™ is a relatively late flowering variety and produces the highest yields in high rainfall and long season districts of southern Australia.

It has a good overall disease resistance profile. Resistance to Ascochyta blight is greater than current Australian faba bean varieties and its reaction to chocolate spot is comparable to the broad bean varieties.

Yield of PBA Rana™ in lower rainfall and shorter season districts is generally less than Fiesta VF and Farah™.

South Australia: highest yields have been achieved in the Lower South East, Central Hills/Fleurieu Peninsula and at high rainfall sites in the Lower Mid North.

Victoria: long-term yields are less than Fiesta VF and Farah™, particularly in recent drought years. There has been limited evaluation in the Western Districts, but the longer growing season in this region should suit PBA Rana™.

Agronomic trials in the Mid North and South-East of South Australia and the Wimmera in Victoria indicate that yields of PBA Rana™ are at least comparable with Nura™, Fiesta VF and Farah™ when sown early. However, relative yields are reduced by a greater extent than that of Fiesta VF and Farah™ when sown late.

PBA Rana™ yields more than broad bean varieties in most districts, the main exception being the Millicent/Connumra district where broad beans produce higher yields.

### 2004 - 2010 Long term yield of faba bean varieties (yields expressed as % Fiesta VF)

<table>
<thead>
<tr>
<th>Variety</th>
<th>South Australia</th>
<th>Victoria</th>
<th>Sth NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Sth East</td>
<td>Mid Sth East</td>
<td>Upper Sth East</td>
</tr>
<tr>
<td>Site mean yield (t/ha)</td>
<td>2.61</td>
<td>3.25</td>
<td>2.22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Faba bean</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PBA Rana™</td>
<td>117</td>
<td>108</td>
<td>93</td>
<td>102</td>
<td>101</td>
<td>95</td>
<td>96</td>
</tr>
<tr>
<td>Farah™</td>
<td>97</td>
<td>100</td>
<td>101</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>102</td>
</tr>
<tr>
<td>Fiesta VF</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Fiord</td>
<td></td>
<td>98</td>
<td>92</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Manafest</td>
<td>107</td>
<td>107</td>
<td>88</td>
<td>90</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Nura™</td>
<td>104</td>
<td>95</td>
<td>98</td>
<td>103</td>
<td>100</td>
<td>100</td>
<td>96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Broad bean</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquadulce</td>
<td>128</td>
<td>89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBA Kareema™</td>
<td>142</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Trial results from Pulse Breeding Australia (PBA)

### Disease resistance rating of faba and broad bean varieties in southern Australia

<table>
<thead>
<tr>
<th>Variety</th>
<th>Plant height</th>
<th>Flower time</th>
<th>Maturity</th>
<th>Lodging resistance</th>
<th>Ascochyta blight</th>
<th>Chocolate spot</th>
<th>Cerco-spora</th>
<th>Rust</th>
<th>PSbMV Seed staining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faba bean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBA Rana™</td>
<td>Medium</td>
<td>Mid</td>
<td>Mid</td>
<td>MR</td>
<td>R</td>
<td>R</td>
<td>MS</td>
<td>S</td>
<td>MS</td>
</tr>
<tr>
<td>Farah™</td>
<td>Medium</td>
<td>Early/Mid</td>
<td>Early/Mid</td>
<td>MS</td>
<td>MR /R</td>
<td>MR/R</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Fiesta VF</td>
<td>Medium</td>
<td>Early/Mid</td>
<td>Early/Mid</td>
<td>MS</td>
<td>MR</td>
<td>MS</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Fiord</td>
<td>Short</td>
<td>Early</td>
<td>Early</td>
<td>MS</td>
<td>MS</td>
<td>MS</td>
<td>VS</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Manafest</td>
<td>Medium</td>
<td>Mid</td>
<td>Mid</td>
<td>MR</td>
<td>VS</td>
<td>VS</td>
<td>MS</td>
<td>S</td>
<td>MS</td>
</tr>
<tr>
<td>Nura™</td>
<td>Short</td>
<td>Mid</td>
<td>Early/Mid</td>
<td>MR</td>
<td>MR/R</td>
<td>MR/R</td>
<td>MS</td>
<td>S</td>
<td>MR</td>
</tr>
</tbody>
</table>

| Broad bean    |              |             |          |        |                   |                  |             |       |                    |
| Aquadulce     | Tall         | Mid         | Late     | MS     | MS                | MS              | S           | S           | MS          | S       |
| PBA Kareema™  | Tall         | Mid         | Late     | MS     | MR/R              | MR/R            | MS          | S           | MR          | S       |

Source: Pulse Breeding Australia trials program 2004-2010

R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible, VS = Very Susceptible
**DISEASE MANAGEMENT**

**Ascochyta blight**
- PBA Rana® is Resistant (R) to Ascochyta blight with a greater level of resistance than Farah® and Nura®.
- Foliar fungicides that target Ascochyta blight control applied at 6-8 weeks post-sowing should not be required for PBA Rana®. However, crops should be monitored and managed if significant disease occurs.
- This improved resistance should reduce the risk of seed staining due to this disease. Ascochyta blight protection during podding should only be required if significant disease occurs on foliage earlier in the season.

**Chocolate spot**
- PBA Rana® is rated as Moderately Susceptible (MS) to Chocolate spot. It is more resistant than Fiesta VF and Farah® and comparable to the broad bean varieties PBA Kareema® and Aquadulce.
- The risk of Chocolate spot is high in the target region. Crops should be monitored regularly and managed accordingly with strategic fungicide applications.
- Foliar fungicides that target Chocolate spot may need to be applied before flowering in very early sown crops.
- In high risk situations applications of fungicides that target Chocolate spot are recommended prior to canopy closure and during late flowering and pod fill.

**Cercospora leaf spot**
- PBA Rana® is Susceptible (S) to Cercospora leaf spot, similar to all other Australian faba bean varieties.
- The risk of Cercospora leaf spot is greatest in paddocks with a long history of faba/broad bean production and when bean crops are grown in tight rotations.
- A foliar fungicide that targets Cercospora leaf spot is recommended to be applied at 5-8 weeks post-sowing.

**Rust**
- PBA Rana® is rated as Moderately Susceptible (MS) to rust.
- Foliar fungicides that target rust may need to be applied before flowering in very early sown crops.
- Otherwise; a foliar fungicide that targets rust is only required in high risk situations, and management should be similar to that used for Fiesta VF and Farah®.

**Pea seed borne mosaic virus**
- Preliminary results indicate that PBA Rana® develops a lower level of seed staining caused by Pea Seed borne Mosaic Virus (PSbMV) than other faba bean varieties.
- Seed staining of susceptible varieties can have an impact on grain quality.
- PSbMV does not cause significant yield loss in faba beans, and no management practices are available to control the disease.

**AGRONOMY**

**Plant characteristics**
- Paddock selection and basic requirements for production are similar to other faba bean varieties.
- PBA Rana® has the following characteristics:
  - Mid to late flowering, similar to Nura® and 5-10 days later than Fiesta VF and Farah®.
  - Mid maturity, later than Fiesta VF, Farah® and Nura®.
  - Medium plant height, similar to Fiesta VF and Farah®, and can form bulky canopies under very high rainfall conditions.
  - Lodging resistance better than Fiesta VF and Farah® and similar to Nura®, but can lodge in very high biomass situations.
  - Has performed well in situations where iron chlorosis can occur on sensitive varieties.

**Sowing**
- PBA Rana® benefits from early sowing and delaying sowing until late May or early June can result in significant reduction in yield.
- PBA Rana® is responsive to sowing rate and a seeding rate similar to other faba bean varieties should be maintained to achieve maximum yields. The larger size of PBA Rana® seed might restrict the seeding rate that can be achieved.
- Seeding equipment must be able to handle the larger seed of PBA Rana® without blockages.
- Trials investigating the effect of row spacing on yield of PBA Rana® indicate a reduction in yield at wider than conventional row spacing.

**Herbicide tolerance**
- In specific herbicide tolerance trials there has been no adverse effect measured at the recommended rate for registered herbicides commonly applied to faba beans. Application of higher than recommended rates indicate a narrow margin of safety for Imazamox (e.g. Raptor®) and Imazethapyr (e.g. Spinnaker®).
- PBA Rana® has been extensively tested in breeding yield trials in which a range of herbicides registered for use in faba beans has been applied at recommended rates. No specific adverse reactions have been observed in these trials.
PBA Rana
Faba bean

SEED QUALITY
PBA Rana® produces large, light brown seeds with a seed size of 65 - 90 g/100 seeds, and 15-20% larger than Fiesta VF and Farah®. Seed size varies between locations and seasons and larger seed is produced under more favourable ripening conditions.

The overall colour of seed samples is uniform and bright. There is a generally low rate of darkening during storage.

PBA Rana® has a high hydration capacity and a low proportion of seeds that do not hydrate which indicates a high suitability for cooking as a whole bean.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Location</th>
<th>Bool Lagoon</th>
<th>Turretfield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faba bean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBA Rana®</td>
<td>75 - 90</td>
<td>65 - 85</td>
<td></td>
</tr>
<tr>
<td>Farah®</td>
<td>55 - 75</td>
<td>55 - 75</td>
<td></td>
</tr>
<tr>
<td>Fiesta VF</td>
<td>60 - 80</td>
<td>55 - 75</td>
<td></td>
</tr>
<tr>
<td>Fiord</td>
<td>40 - 55</td>
<td>40 - 50</td>
<td></td>
</tr>
<tr>
<td>Nura®</td>
<td>55 - 65</td>
<td>50 - 70</td>
<td></td>
</tr>
<tr>
<td>Manafest</td>
<td>75 - 95</td>
<td>65 - 85</td>
<td></td>
</tr>
<tr>
<td>Broad bean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquadulce</td>
<td>110 - 115</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBA Kareema®</td>
<td>130 - 145</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Pulse Breeding Australia

MARKETING
- PBA Rana® is highly suitable for the human food market for medium to large faba beans, and under favourable growing conditions could fit the small broad bean category.
- It represents a different quality category for Australian faba beans. There has been very positive feedback from the market in Egypt for this larger type of faba bean. This category is not produced by other major faba bean exporters and variety segregation will be necessary.

FOR MORE INFORMATION

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

PBA Faba bean
Jeff Paull
University of Adelaide
School of Agriculture, Food & Wine
Waite Campus
Glen Osmond, SA 5064
Ph: 08 8303 6564
jeffrey.paull@adelaide.edu.au

SEED ENQUIRIES

Seednet
National Production and Logistics Office
18 - 22 Hamilton Rd
PO Box 1409, Horsham Vic 3402
Ph: 1300 799 246
Fax: 03 5381 0490
admin@seednet.com.au
www.seednet.com.au

Central & Southern NSW
Robert Gill
Ph: 0428 122 465
robert.gill@seednet.com.au

South Australia & Western Australia
Sam Densley
Ph: 0417 891 436
sam.densley@seednet.com.au

South Australia & Western Australia
Victoria & Tasmania
Chris Walsh
Ph: 0417 891 546
chris.walsh@seednet.com.au

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 faba bean varieties.

AGRONOMIC ENQUIRIES

South Australia
Wayne Hawthorne, Pulse Australia, Ph: 0429 647 455

Victoria
Wayne Hawthorne, Pulse Australia, Ph: 0429 647 455

BREEDING

PBA Rana® (evaluated as 974*(611*974)/15-1) was developed by the PBA faba bean breeding program, lead by the University of Adelaide. It was produced as a backcross to Manafest (Accession 974) as the recurrent parent and Accession 611 as the donor for the high level of Ascochyta blight resistance.

Disclaimer: Recommendations have been made from information available to date and considered reliable, and will be updated as further information comes to hand. Readers who act on this information do so at their own risk. No liability or responsibility is accepted for any actions or outcomes arising from use of the material contained in this publication. Reproduction of this brochure in any edited form must be approved by Pulse Breeding Australia © 2011

Version July/2013