



**PBA**  
PULSE BREEDING AUSTRALIA

## Summer 2007/08 News

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### **PBA – BETTER PULSE VARIETIES FASTER**

Welcome to our Pulse Breeding Australia (PBA) newsletter.

To start our first newsletter a little background about Pulse Breeding Australia. PBA provides a single world class breeding and germplasm enhancement program for chickpeas, field peas, faba beans and lentils in Australia. Bringing together the four breeding programs with the support of the germplasm enhancement program, PBA aims to fast-track the release of new pulse varieties to Australian growers. The formation of PBA allows for the sharing of ideas, innovation and resources, such as field trial sites across Australia, to create more effective and cost efficient breeding programs.

PBA is an unincorporated joint venture between:

- the Department of Primary Industries, Victoria (VDPI),
- NSW Department of Primary Industries (NSW DPI),
- Queensland Department of Primary Industries and Fisheries (QDPI&F),
- South Australian Research and Development Institute (SARDI),
- Department of Agriculture and Food Western Australia (DAFWA),
- The University of Adelaide,
- Pulse Australia and
- GRDC. All parties have signed a participation agreement and in addition we have developed a National Plan detailing key strategies for implementation. PBA is managed by an advisory Board and Coordination Group (CG) and all participating organisations have a position on each of these bodies. In general terms the role of the PBA Board is to provide strategic direction for PBA and the CG is responsible for coordinating PBA operations activities, practices and products.

The PBA CG and Board recognise that the field and operational staff involved in PBA play an integral role in delivering superior pulse varieties faster to Australian growers. The aim of this newsletter is to keep people up to date with PBA activities, highlight items of interest to the wider PBA community arising from PBA meetings and provide updates on happenings within each of the specific crops. Any items of interest for inclusion will be most welcome and can be sent to the PBA Coordinator.

## PBA MEETING ITEMS

### Development of Molecular Markers for PBA Breeding Programs

An ARC project developed by Richard Oliver and Simon Elwood (Murdoch University) aimed at developing high density genetic maps and molecular markers for PBA pulse breeding had been proposed. However, the withdrawal of funding support from several state agencies highlighted the need for a clear strategy and the PBA Board agreed that it no longer pursued the ARC Linkage project until a strategy for pulse molecular markers had been approved. If appropriate a new ARC proposal may be developed for the next funding round (May 2008).

### Biometric Support for PBA

Brian Cullis (Leader National Statistics Program) addressed the CG, discussing the current National Statistics Program and outlining possible changes to the next phase of the project. Key points included:

- **Current Support:** Within the National Statistics Program support for the breeding programs, including PBA, is provided under Key Program 1. It was acknowledged that there is currently not enough support available for the southern region. It is hoped that this will be addressed in the next phase of the project (which, if funded, will begin in July 2008)..
- **Database Improvement:** The National Statistics Program is developing a 'cloned NVT' which will be used to more easily manipulate and analyse data and store results. Following beta-testing of this database changes will be made to the NVT database to make ongoing statistical analysis and storage of results within the NVT an easier process. Paul McGowan, QDPI Toowoomba will begin work full-time on July 1 to manage this process. Some work involving chickpeas has already commenced and Brian will initiate further communication with the PBA Program Leaders to discuss how more PBA data may be used in this process. PBA staff will have access to the "clone database" through a secure link. As well as NVT this database will be able to handle S3 and other data relevant for analysis.
- **Statistical Training:** The National Statistics Program offers training courses in statistical analysis. Brian Cullis can be contacted for course dates.
- **Web Forum:** A forum in which people can get advice re statistical analysis issues is currently being developed and will hopefully soon be available to a wider audience. The forum will be held on a secure site with access limited by security logon.

The PBA CG raised the following points regards biometric support. These issues will be discussed with Brian Cullis and the GRDC:

- Access to biometricians for breeding trial work remains an issue. This work needs to occur in a timely manner to allow for selections to be made and progressed through the breeding programs.
- Access to new statistical methods is also an issue and the CG would like to see more ready access to the methods being developed with the NSP. Breeders could then more easily perform their own analysis in the database of their choice, in a timely manner, without the need to rely on biometricians.

### **PBA and the National Rhizobial Screening Program**

The National Rhizobial Screening Program (NRSP) is up for renewal in 2008 and at this stage GRDC will be the sole funder. Paul Meibusch (GRDC Program Manager, New Products) requested feedback on the current project and would like to see the development of a closer working relationship with PBA to ensure improvements can be made both in terms of individual crop performance and overall nitrogen fixation in the farming system.

The CG has provided the following feedback to Paul Meibusch regards PBA requirements for inclusion in the new phase of the project:

- Screen 20 parental lines for each of the four PBA crops against the commercially available and common field strains of rhizobia each year, with data provided back to the PBA breeders.
- Following examination of the data PBA breeders to have an option to request further follow-up work on specific lines (for example if no rhizobial strains are available for a promising parent line more work could be conducted to find an appropriate strain).
- The National Rhizobial Screening Program to provide a report detailing currently available information regarding rhizobial strains and that symbiosis of current strains is optimal for each crop.

### **Pulse Crop Reference Group Meeting Outcomes**

A report, prepared by Wayne Hawthorne, on the outcomes of the Pulse Crop Reference Group Meeting held in conjunction with the Agriculture Australia Conference on the 8<sup>th</sup> August 2007 is available (please email the PBA Coordinator Fleur Winter if you would like a copy). This annual meeting, along with overseas visits by breeders and marketers to end users, is a major way in which PA assists in gathering feedback as to pulse variety traits and breeding priorities. Being market driven is one of PBA's core strategies.

The CG discussed the report and methods of capturing market feedback in general and the following actions were agreed:

- Wayne Hawthorne, with input from the PBA CG and industry, to revise the existing Market Preference Tables for each of the pulses and investigate means of including the traits of overseas competitor varieties in these tables. These tables are useful as a 'quick reference' particularly in discussions with end users.
- Pulse Australia and PBA to investigate whether a similar meeting to the Pulse Crop Reference Group Meeting should be organised in conjunction with Grains West Expo held in Western Australia every two years.
- Pulse Australia and PBA to investigate methods of better capturing feedback from end users. As per the PBA Board suggestion, if possible Pulse Australia to liaise with Pulse Canada as to the methods they use to gather end user feedback.
- PBA to ensure that overseas marketing trips are proactively organised to ensure maximum benefit is gained from planned activities. Fleur Winter to liaise with the PBA CG and PA as to visits planned into the next 12 months. List of visits to be review and updated at each PBA CG meeting.

### **Naming of New Varieties**

The issue of branding PBA varieties to ensure good recognition of PBA was discussed by the CG. The following actions were agreed.

- To ensure good recognition of PBA into the future the name of all new varieties released from the breeding programs is to be prefixed with PBA.
- PBA breeders to consider suitable series names to use for each of the four crops and bring suggestions to the next CG meeting.

### **National Disease Ratings for Pulses**

A disease rating document for chickpeas has been developed and is nearly at final draft stage, pending agreement on how to relate different ratings in western and eastern Australia. A disease rating table for lentils is also underway. With completion of the chickpea ratings work on national systems for field peas and faba beans will follow and it is hoped that it will be easier to reach agreement for these crops. The CG considered whether other traits such as plant features and agronomic quality could/should be developed into a similar “National Variety Characteristics” table for each of the crops. These tables would contain all released varieties and lines nominated for NVT and include agronomic and quality characteristics (i.e. lodging resistance, maturity time, grain size, colour etc). The tables would be distributed to relevant people and groups for use at NVT field days etc.

### **PBA Logo Branding v s. Agency and Seed Company on Publications/Promotional Material**

The PBA Board and CG have agreed that to ensure PBA becomes a recognised brand PBA logos on promotional material should always be prominent and where possible other logos kept to a minimum. However, it was noted that in certain circumstances, such as a State Department field day or the release of a new variety by a commercial partner, participating organisations will want to include their own branding and logos.

### **PBA Input to Pesticide Registration**

Rohan Rainbow (GRDC Project Manager – Crop Protection) led an initial discussion with the CG regarding this issue. Key points included:

- Currently there are some pulse research projects underway using pesticides for which no crop maximum residue limits (MRLs) have been developed. This is an issue as pesticide cannot legally be used without specific crop MRLs and the development of MRLs can be very costly (in the order of \$500k) due to the need to conduct grazing studies.
- If a pesticide is going to be useful for a particular crop, permits for its use can be issued under the Australian Pesticides and Veterinary Medicines Authority (AVPMA) Minor Use Program. It is hoped that this program will be expanded in the near future to allow data collected in the USA to be submitted to support Minor Use Permits.
- A database of Minor Use Permit Approvals and Applications for Approval is available and this information is particularly relevant to pulse crops as many of the pesticides used on pulses are approved via this process.
- Rohan Rainbow would like to encourage more interaction with PBA regarding the prioritisation of pesticides used for pulses under the Minor Use Permits program, to

help ensure pesticides found useful within research projects are available for labelled use by growers.

- Currently Gordon Cummings is the Pulse Australia contact for pulse pesticide registration. It was suggested that Wayne Hawthorne become the PBA contact for pesticide registration issues.

### **Pulse Breeding and Agronomic Direction in Future**

Pulse Australia (PA) is conducting a GRDC requested review into the current pulse agronomic and extension work being conducted in Australia so as to identify any gaps or requirements for the future. As part of this PA is looking to gather information on the types of new varieties planned for the future and how these can be best supported as they move into current and future farming systems. This information will be combined with views regarding future changes in farming systems and how pulses may best be used in these systems. To help maintain a continuing link between breeding activities and agronomic research and extension PA is seeking feedback from PBA Breeders regarding their future plans for variety development. A survey has been developed by PA for the purpose of breeder feedback and was distributed at the last CG meeting by Wayne Hawthorne.

### **PBA Key Performance Indicators (KPI) Report**

PBA has developed a number of Key Performance Indicators to help capture and report the successes and benefits of PBA to the organisations involved, growers and the wider pulse industry. The first report of performance against KPIs is to be presented to the PBA Board at the March 08 meeting. The PBA Coordinator, CG and Board will be working towards compiling this report in the coming months.

### **Protection of the PBA Logo**

In order to guarantee exclusive use of the PBA name and logo now and in the future throughout Australia an application for trademark of the logo was lodged with IP Australia. The application was accepted and following payment of a registration fee and a period of time for objections (three months) the logo will be formally trademarked and protected.

# CROP NEWS

## FABA BEANS

### *Seasonal conditions*

2007 was a very mixed season, with trial yields ranging from around long-term averages to barely worth harvesting. Sufficient trials were in the more favourable locations to give a good complement of results for data analysis and selection, and most importantly there will be sufficient seed at all stages in the program for trials in 2008. In addition to good results from yield trials, there was a good level of disease establishment in disease nurseries (Ascochyta blight at Turretfield and rust at Narrabri) to enable selection for resistance and there were also very severe frosts and significant stem collapse at Narrabri with a good range of genetic variation for tolerance.

### *Funding*

The Australian Faba Bean Breeding Program (GRDC project UA00097) commenced on 1 July and will continue to 30 June 2011, putting it in line with all other PBA projects. UA00097 was effectively implemented at the start of this cropping season, and with this there was a reduction in the number of trial sites and also number of trials at some sites to fit within the new level of funding. The major focus of the project is similar to previous projects with disease resistance having a very high priority and quality being targeted to the Middle East food market. The project is led by University of Adelaide and there are two nodes with the Adelaide group breeding for the Mediterranean environment and the northern NSW group breeding for a sub-tropical environment.

### *New varieties and multiplications*

A new faba bean variety "Doza", tested as the breeding line SP01040, was commercialised by the NSW DPI group, with Graintrust as the commercial partner. Doza has a high level of rust resistance, very good radiation frost tolerance, uniform seed size and colour and has yielded very well in northern NSW. Doza offers many agronomic advantages over Cairo and is expected to add to the development of the faba bean industry in the north

Multiplication of a new broad bean variety commenced in the South East of SA in 2006. This line is a selection from Aquadulce with improved seed characteristics (no evergreens and more uniform size and colour), improved disease resistance and slightly higher yield.

Unfortunately the drought had a serious impact on the multiplication, but a summer multiplication in Tasmania saved the day and produced enough seed to enable approximately 30kg to be sown at Millicent in June. Seasonal conditions have been very favourable and it is anticipated that over 800kg will be harvested.

Large plots of two breeding lines, 1269\*483/6-1 (high yield, resistant to Ascochyta blight and Cercospora leaf spot, OK for chocolate spot, white hilum) and 974\*(611\*974)/15-1 (similar adaptation and seed type to Manifest with resistance to Ascochyta blight), were sown at Charlick and 80 – 100kg of each line was produced. A decision on release of these lines will be made following analysis of all of the 2007 trials.

**Travel**

Jeff Paull, leader of the faba bean program, had the opportunity to travel to Liaoning Province in China in July, with Bob Redden, to present seminars at the Cash Crop Institute of Liaoning, on faba beans and field peas and hold discussions on developing a faba bean and field pea industries in this region. This region is adjacent to North Korea, about 40°N, and with a very severe winter with maximum temperatures below -10°C. Crops are sown in March when the snow thaws and are harvested in late June or early July and a second crop is sown immediately after. Not surprisingly, Australian faba bean lines, based on Mediterranean germplasm, did not perform very well in trials in 2007 and it is likely that European spring sown faba beans would perform better in this region.

**CHICKPEAS*****New Commercial Partner***

AWB Seeds was selected to be the commercial partner for new desi varieties. (A commercial partner for kabuli varieties will be selected at a later date). Seed increase is already underway for the three breeding lines identified in the tender document. CICA0512 is targeted at northern NSW and southern Qld. It combines moderate resistance to phytophthora (equivalent to Jimbour) with good ascochyta resistance (better than Flipper) and high yield. CICA0503 and CICA0505 are suited to southern and western environments and combine the excellent ascochyta resistance characteristic of the 'Genesis' series with the high yield potential of Howzat (one of the parents). A formal launch of these varieties is most likely in 2008 and the first significant commercial areas are expected in 2009.

The AWB Seeds and PBA commercial partnership was officially and successfully launched during a field day at North Star, NSW on the 10<sup>th</sup> October. The field day was attended by PBA Coordination Group Member Ted Knights and PBA Board Members John Sykes and Rex Williams and AWB Seeds representative John Thelander.



*Ted Knights speaking at the PBA AWB Seeds Commercial Partnership Launch, North Star October 10<sup>th</sup>.*

***Back From the Dead***

The chickpea industry was on its knees following the ascochyta epidemic of 1998 but there are encouraging signs of a major recovery in most key production regions in Australia.

The reasons underpinning the recovery are varied and include price, sowing moisture and most importantly, better varieties. In Central Qld and NSW good soil moisture has seen estimated sowings of 45,000 ha and 230,000 ha, respectively – a record area for NSW and near record for Qld. In Victoria and SA, area growth has been constrained in 2007 because seed of new ascochyta resistant varieties was in short supply following the 2006 drought. There has been a significant shift to kabulis there, in part because of the high yield potential of Genesis090.

This variety accounts for at least 80% of kabuli production this year.



### *Project Meeting, Central Qld*

The chickpea management group met in Central Qld during the week 12-17 August to conduct a detailed review of the breeding methodology and discuss other issues that have arisen as a result of the new landscape created by PBA. It gave many of the team their first look at the vastly different agriculture in Central Qld and an opportunity to inspect the rapid progress in yield, harvestability and seed quality being made by the team at Biloela.

*An excellent crop of Moti Chickpeas in Central Queensland (2007)*

## **LENTILS**

### *Launch of Boomer and Nipper*

The green lentil Boomer and red lentil Nipper were launched at the Paskeville field days in October and the Pulse field day at Dimboola in November. Boomer and Nipper represent the first Australian bred lentil varieties. Nipper has excellent resistance to ascochyta blight and botrytis grey mould for major lentil growing areas and Boomer offers potential for the basis of a significant green lentil industry in Australia. These varieties are the start of a pipeline of elite varieties developed in Australia that will sustain the lentil industry into the future. AWB Seeds is the commercial seed partner for Boomer and Nipper. Seed is available for sowing in 2008.

### *Benefits from long term seed partner*

PB Seeds are the commercial partner for PBA lentils. Director Peter Blair has visited trials in South Australia and Victoria with breeding staff to gain a better understanding of the breeding program. Seed production was expanded to 25 lines in 2007 to more rapidly deliver varieties to farmers. This has been made possible by funding provided by PB Seeds and the ability to offset production and variety risk by the provision of a pipeline of varieties. A RAG meeting was held in November and the basis for operations have been developed and a draft of the Commercial Release Decision Making Criteria has been written. CIPAL411 is likely to be the first release from the partnership with 1 tonne of seed expected to be produced in 2007.

***Value of close links between PBA and agronomic management projects***

The value of close links between PBA and agronomic management projects will realise the potential of new lentil varieties and is generating options for new varieties. Due to the work of Larn McMurray and Jason Brand respectively, CIPAL411 is gaining momentum for sowing in medium-low rainfall areas where high yield and early maturing (crop topping) will benefit lentil production while Boomer green lentils may be a suitable fit for no till farming in Victoria.

***Bye bye Kerry***

Kerry Regan is moving on from PBA to develop her career in a leadership role in DAFWA. We would like to thank Kerry for her input into the lentil program over the last decade as well as her contributions to the PBA Coordination Group . She has always been a leader in the lentil program and has made a major impact on pulse improvement and the industry in Australia both now and into the future. We will miss her organisation, professionalism and friendship.

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