

25. South East Pulse Observation Trials

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KEY MESSAGES

- A MFMG and SARDI initiative.
- Observation trials showcasing of a range of pulses at three main trial sites.
- Results suggest a variety of pulses may be adapted to the south east.

Background

Research has shown that various break crops, can be as profitable as wheat and that sequences including break crops tend to be more profitable than wheat-on-wheat rotations (Project CSP00146). Introducing break crops into the cropping rotation can reduce disease incidences for cereals, offer additional weed control methods, improve soil fertility and reduce the impact of fluctuations in commodity prices and seasonal conditions through a greater range of grain products.

The South East region tends to have low pulse adoption compared to other regions in South Australia, largely attributed to highly variable soil types, weed and disease management issues, unreliable yields and fluctuating prices, especially if food grades cannot be produced. Hence, they are considered a high risk option requiring a greater amount of crop management. However, high lentil and chickpea prices have recently renewed interest in pulses.

Activities

Building on grower interest and discussions at MFMG Operations meetings, in 2016 the MFMG and SARDI initiated three pulse observational trials at the main field trial sites, Keith, Frances and Conmurra. Beans were not included in the observational trials, as they were already represented in bean variety trials at the sites.

The trials were designed to showcase a range of pulse varieties and initiate discussions within the MFMG about pulses. A range of varieties, selected for adaption to the south east, varying maturities, different seed sizes and colour (market opportunities) were evaluated. Varieties were replicated twice and as such

results were not statistically analysed. Presented in Table 1 are average raw yields from plots. In instances where a crop type or variety were not successful (waterlogging, not suited to soil type, weed pressure, maturity unsuitability or herbicide damage) at a site, these plots were abandoned and no results reported.

Each crop was managed to maximise yield. Trials were sown at Keith on 24 May, Frances 16 May and Conmurra 17 May 2016. Plots were harvested as they reached maturity.

Table 1: Yields and 100 seed weights for pulse observational trials at Keith, Frances and Conmurra. '-' represents an abandoned plot.

Pulse Crop	Variety	Keith			Frances		Conmurra		
		Grain yield	100 seed weight	Market Suitability	Grain yield	100 seed weight	Grain yield	100 seed weight	Market Suitability
		t/ha	grams		t/ha	grams	t/ha	grams	
Lupins	Jenabillup	1.06	11.8		1.52	13.7	-	-	
	Mandelup	1.70	11.7		1.08	13.5	3.46	14.6	
	PBA Barlock	1.19	11.8		0.99	12.3	-	-	
	PBA Gunyidi	1.16	11.8		1.33	12.8	3.28	14.1	
	PBA Jurien	1.59	10.9		1.46	12.9	3.56	14.6	
Chickpeas	Genesis 090	2.47	30.3	52 % > 8 mm	-	-	5.27	30.7	53 % > 8mm
	Genisis Kalkee	1.81	41.2	92 % > 8 mm	-	-	3.69	44.8	95 % > 8 mm
	PBA Monarch	2.23	39.8	85 % > 8 mm	-	-	4.23	40.2	87 % > 8 mm
	PBA Slasher	2.25	20.0	split & whole	-	-	2.80	19.2	split & whole
Lentils	Nipper	2.62	2.8		-	-	4.05	3.2	
	PBA Blitz	2.58	4.3		-	-	4.51	4.5	
	PBA Giant	2.49	6.3		-	-	3.00	6.6	
	PBA Hurricane XT	2.40	3.0		-	-	5.46	3.6	
	PBA Jumbo 2	2.44	4.3		-	-	2.06	5.2	
Field Peas	Coogee	3.78	20.6		-	-	2.15	21.4	
	Excell	2.02	16.7		-	-	3.47	20.0	
	PBA Pearl	5.99	23.0		-	-	4.80	23.5	
	PBA Percy	4.45	24.1		-	-	-	-	
	PBA Wharton	4.78	22.1		-	-	-	-	

Variety Information

Information sourced from SARDI 2017 Sowing Guide. Additional information on crop management is available in this publication which can be found at <https://grdc.com.au/SA-SowingGuide2017>

Lupins

PBA Barlock (tested as WALAN2325) was released in WA in spring 2013. It is a high yielding variety which provides a significant yield improvement in most regions of SA. PBA Barlock has improved metribuzin tolerance over the varieties Tanjil and Wonga, allowing growers to use metribuzin for weed control. PBA Barlock is early flowering and maturing, is MR to lodging in high rainfall regions, and shows improved pod shatter resistance compared to Mandelup. It is R to anthracnose and MR to phomopsis stem blight. PBA Barlock has its greatest long-term yield advantage over Mandelup on the Eyre Peninsula. PBA Barlock seed is available through Seednet.

PBA Gunyidi (tested as WALAN2289) was released in WA in September 2011 as a potential Mandelup replacement with improved resistance to pod shattering. This feature has enabled growers to harvest later without incurring significant losses. PBA Gunyidi is MR to anthracnose and R to phomopsis stem blight. It flowers and matures slightly later than Mandelup. It is R to metribuzin herbicide, but is more susceptible to damage from Eclipse®. Long-term trials in SA show PBA Gunyidi is particularly well suited to the Eyre Peninsula region. Seed is available through Seednet.

Jenabillup has been in extensively trialled in SA trials, where it typically has an advantage over Mandelup in regions with a longer growing season. In these regions its extended flowering window can assist with increased yield. Jenabillup flowers slightly later and for a longer period than Mandelup, making it less suitable to crop topping. Jenabillup is R to black pod syndrome, although this rarely occurs in SA. Jenabillup does not have tolerance to metribuzin herbicide and has an S anthracnose rating. Jenabillup was first available to SA growers in 2011 and seed is available through Seednet.

PBA Jurien (tested as WALAN2385) was released in WA in spring 2015. It has improved yields compared to Mandelup across most SA regions, with long-term yield advantages observed on the Eyre Peninsula. It is R to anthracnose, phomopsis on stem and grey spot. Although rated R to anthracnose seed dressings are still recommended to reduce the risk of soil borne disease. It is tolerant to metribuzin, superior to PBA Barlock. PBA Jurien has similar agronomic characteristics to PBA Gunyidi, flowering slightly earlier than PBA Barlock. It is similar to Mandelup in height and is MS to lodging in high rainfall regions. PBA Jurien has medium to large seed, similar to Mandelup and the alkaloid content is similar to PBA Gunyidi. PBA Jurien is available to Eastern states growers for 2017 planting. Growers should contact Seednet Partners for supply of seed.

Mandelup is widely adapted to SA conditions and as such is established as a leading variety. Mandelup is a tall variety, with good early vigour and very early flowering and maturity, making it well-suited to low/medium rainfall districts in SA while still yielding well in higher rainfall areas. Its early maturity makes it suitable for crop topping, with careful attention to correct timing. Mandelup is MR to anthracnose. It is R to phomopsis on stem and MS to brown leaf spot. It can suffer pod loss/partial pod shattering with delayed harvest and seed quality can suffer if wet conditions occur during harvest.

A possible weakness in higher rainfall districts is its relatively poorer stem strength and potential lodging, although this has not been observed at wet sites in recent years. Mandelup seed is available in SA through Heritage Seeds Pty Ltd.

Jindalee is the latest flowering and maturing variety currently available. It is suited to early sowing in higher rainfall districts where its vernalisation (cold requirement) prevents it from flowering too early. It is suited to situations of bulky dense canopies that would otherwise lead to poor pod set in other varieties. Jindalee can benefit from late spring rains. Jindalee long-term yield performance is well below Mandelup across all districts in SA. Jindalee's anthracnose rating is MS, this level is generally adequate if combined with seed testing, paddock monitoring and sound crop hygiene management. Jindalee is R to phomopsis and MR to brown leaf spot. In SA it appears to have improved resistance to root rots and premature wilting that occurs on duplex soils with shallow underlying clay. Jindalee has speckled seed and medium seed alkaloid levels. Seed is available through Seednet.



Figure 1: Sherwood trial site 5th October 2016
Photo courtesy Amanda Pearce, SARDI

Chickpeas

PBA Monarch is a high yielding medium sized kabuli chickpea with adaptation to all kabuli growing areas of Australia. The *Aschochyta blight* (AB) rating for PBA Monarch has been reduced to susceptible and crops will require regular vegetative and reproductive foliar fungicide sprays every 2 to 3 weeks. All chickpea seed should be treated with a thiram based fungicide to prevent seed transmission of AB on to the emerging seedlings in 2017. It is particularly well suited to the shorter seasoned medium rainfall environments of south eastern Australia due to improved adaptation through earlier flowering and maturity compared to Genesis™ 090, Almaz and Genesis™ Kalkee. It is adapted to the traditional kabuli chickpea growing regions and has shown a consistent and significant yield advantage over all current medium and large seeded kabuli varieties, providing AB can be managed. It has similar yields and larger seed size than Genesis™ 090 although is higher yielding than this variety in low yielding (< 1 t/ha) situations. In shorter growing seasons, PBA Monarch may have larger and more consistent seed size than other medium sized varieties due to its earlier pod filling timing. Seed is licensed to Seednet.

Genesis™ 090 is a small to medium seeded kabuli (7-8 mm). The AB rating for Genesis™ 090 has been reduced to moderately susceptible and crops will now require 3 to 4 strategic fungicide sprays during the season ahead of rain fronts, the sprays offering 2-3 weeks protection against infection. All chickpea seed should be treated with a thiram based fungicide to prevent seed transmission of AB on to the emerging seedlings in 2017. Genesis™ 090 has medium height with erect branches and yields similar to PBA Monarch but lower than PBA Slasher and PBA Striker. Seed is licensed to Australian Agricultural Crop Technologies.

Genesis™ Kalkee is a medium to large seeded kabuli type, late in flowering and large in seed size. It is rated as moderately susceptible to AB and will require 3 to 4 strategic fungicide sprays during the season ahead of rain fronts, the sprays offering 2-3 weeks protection against infection. All chickpea seed should be treated with a thiram based fungicide to prevent seed transmission of AB on to the emerging seedlings in 2017. It has the largest seed size of all commercial kabuli types hence more able to meet the size requirements of premium high valued markets. However yield is inferior to the small kabuli types and PBA Monarch but generally similar to Almaz in SA. It is licensed to Australian Agricultural Crop Technologies.

PBA Slasher is now rated as moderately susceptible to AB and will require 3 to 4 strategic fungicide sprays during the season ahead of rain fronts, the sprays offering 2-3 weeks protection against infection. All chickpea seed should be treated with a thiram based fungicide to prevent seed transmission of AB on to the emerging seedlings in 2017. PBA Slasher is high yielding in all chickpea growing areas of SA, providing AB can be managed. It has a semi-spreading plant type with mid flowering and mid maturity similar to Howzat. PBA Slasher is suitable for both the split and whole seed markets as it has improved seed size and colour over varieties like Genesis™ 509 which are only suited to split seed markets. Seed is licensed to Seed Net.

Lentils

PBA Hurricane XT was the second lentil variety to be released with improved tolerance to the herbicides imazethapyr and flumetsulam, plus reduced sensitivity to some sulfonylurea and imidazolinone herbicide residues. However, it is important to note that product label rates, plantback periods and directions for use must still be adhered to. It is a mid-flowering, mid maturing variety with small red seed and a grey seed coat, although the seed size is slightly larger than Nipper and PBA Herald XT. PBA Hurricane XT has a MR rating for foliar AB and a MR/MS rating for BGM. In disease prone areas a strategic fungicide programme for BGM will be required and early sowing should be avoided. Plant height and early vigour are improved over Nipper and PBA Herald XT, improving weed competition and harvestability. Like PBA Herald XT and Nipper, PBA Hurricane XT has been found to be more sensitive to Group C herbicides such as metribuzin and simazine than other lentil varieties, however, label rates of these herbicides have been used on most evaluation trials. It is important to be cautious when applying these herbicides on variable soil types, especially if weather conditions conducive to crop damage are forecast. PBA Hurricane XT is the highest yielding small red lentil and is commercialised by PB Seeds.

Nipper is rated R/MR to BGM but its AB rating has been reduced to MR/MS, similar to Nugget. Strategic vegetative and podding sprays for AB are now recommended in this variety in disease prone areas. Nipper has a small seed size similar to PBA Herald XT. Nipper, like PBA Herald XT, flowers later than Nugget but often matures earlier. Nipper is more sensitive to metribuzin than most other varieties and caution is required to avoid application when conditions are conducive to damage. Nipper is licensed to Seednet.

PBA Blitz is suited to all current lentil growing areas, with particular adaptation to shorter-season areas, where its combination of early to mid flowering, early maturity, moderate disease resistance and medium seed size will improve lentil reliability and economics of production. PBA Blitz is the earliest maturing lentil variety and the best option where crop topping and/or delayed sowing are practised. It has a good level of early

vigour and an erect plant type. PBA Blitz is a medium sized red lentil (larger than PBA Flash and Nugget) with a grey coloured seed coat. PBA Blitz has a low level of "pale coat Blitz" seeds which still have red cotyledons and are a natural part of the genetic make-up of the variety. These do not affect the splitting or cooking characteristics of the variety. These "pale coat Blitz" seeds are classified at receipt point as seeds of contrasting colour with a limit of 1% allowed. PBA Blitz is commercialised by PB Seeds.

PBA Jumbo2 is the highest yielding red lentil available for SA. PBA Jumbo2 was released as a direct replacement for PBA Jumbo although grain size is almost the only similarity. It has improved agronomic characteristics over PBA Jumbo, including greater early vigour, improved lodging, shattering and disease resistance. It is rated R for AB and R/MR for BGM, however disease monitoring and a fungicide application prior to canopy closure is still recommended for the latter. It has a seed size and shape similar to PBA Jumbo and Aldinga (20% larger than Nugget) but with a grey seed. As with other large seeded varieties PBA Jumbo2 is well suited to the post-harvest removal of small broadleaf weeds seeds. PBA Jumbo is licensed to PB Seeds.

PBA Giant is the largest seeded Australian green lentil available. It is a broadly adapted variety with similar yield to Boomer but improved shattering resistance and produces a slightly larger and more consistent seed size. Although shattering resistance is improved over that of Boomer, it is rated MR/MS for this trait and timely harvest is important to prevent seed loss. PBA Giant has moderate resistance to AB but is rated moderately susceptible to BGM, and therefore monitoring and timely application of fungicides will be important to ensure the control of disease. As pods are susceptible to AB infection a strategic fungicide application at podding may also be required to minimise seed staining and maximise seed quality. The large seed size may provide opportunity for removal of small broadleaf weed seeds from the harvested sample. PBA Giant is commercialised by PB Seeds.



Figure 2: Lentils at the Conmurra Pulse Evaluation site.

Field Peas

PBA Wharton is a 'Kaspa seed type' dun pea offering improved powdery mildew and virus resistances (Bean Leaf Roll and Pea Seed Borne Mosaic viruses). It provides the same agronomic benefits as Kaspa (eg lodging and shattering resistance), and will provide a reliable alternative in those areas where powdery mildew and viruses are regular problems. PBA Wharton is early to mid flowering and early maturing, making it well suited to the practices of crop topping and delayed sowing for blackspot management. It was the highest yielding variety in SA NVT and PBA trials in 2014 and second highest behind PBA Pearl in 2015, but has yielded similarly to PBA Gunyah and PBA Twilight in previous years. Seed is licensed to Seednet.

PBA Percy is an early flowering conventional dun variety with improved resistance (MR) to bacterial blight (*pv syringae*) over all other varieties making it a good option in areas prone to this disease. Its early flowering and early maturity make it well suited to delayed sowing for disease management and the agronomic practice of crop-topping. It produces non sugar-type pods, but is not prone to shattering (similar to PBA Oura). PBA Percy seed is dimpled and not a 'kaspa seed type'. PBA Percy generally produces yields similar to PBA Oura but in low rainfall environments can be the highest yielding dun variety in trials. Seed is licensed to Seednet.

PBA Coogee is a mid flowering and mid maturing conventional dun pea suitable for either grain or forage production. It has higher grain yield and similar biomass production to Morgan, and grain yield between Parafield and Kaspa. Flowering and pod set is generally slightly later than both Parafield and Kaspa. PBA Coogee is resistant to powdery mildew and has improved tolerance to soil boron and salinity compared to other varieties. Seed is licensed to Seednet.

PBA Pearl is a semi-leafless white pea variety which is broadly adapted and the highest yielding field pea in long term evaluation trials in all areas of SA. It has an erect growth habit, often with excellent lodging resistance at maturity. It is early to mid flowering and produces non sugar-type pods but is not prone to shattering (similar to PBA Oura). It has a favourable disease resistance profile, with good resistance to Bean Leaf Roll virus, and moderate susceptibility to bacterial blight. Seed is available through Seednet and growers are advised to secure markets before deciding to grow white peas as they cannot be delivered to bulk dun or Kaspa type export markets.

The results for the NVT pulse site at Keith that contains a lot of these crops can be found at www.nvtonline.com.au

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