

Trial Results

Pulse variety trial results

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Key Outcomes

- Yarrum peas have been the highest yielding variety over the past several years.
- PBA Flash is a red lentil that has performed well, probably because it is earlier maturing and springs have often been poor.
- PBA Slasher and Genesis 079 are the highest yielding desi chickpeas, although Genesis 090 also did well at Struan where late rainfall helped.
- Farah beans generally performed well in the South East in 2009 and the hot finish did not suit Nura as it is later flowering than Farah.
- Jenebillup outperformed Mandelup again and small quantities of seed should be available in 2011.

Trial Objectives: To assess the best pulse crop varieties for the South East

Trial Duration: 2007-2008

Location: What site. **Farmer Cooperator:** Owen Croser, Mike Hunt, Trevor Kennett, Mike Obst, Gordon Stopp, Wayne Hawkins, Andrew Smith, John Cooper, Brett Gilbertson

Soil Type: Various.

Paddock History: Various

Monthly Rainfall:

Long Term Av Monthly Rainfall

Rain	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Total
Keith, 2009	0	0	19	53	15	49	106	58	58	20	55	19	452
Mundulla, 2009	0	0	28	38	23	48	127	83	82	12	57	24	522
Frances, 2009	2	4	25	30	20	51	110	81	68	32	45	21	489
Struan, 2009	3	0	53	51	16	64	123	115	99	41	53	28	645
Millicent, 2009	8	0	49	52	53	66	175	132	116	35	61	28	775

Water Use Efficiency:

Yield Limiting Factors: Heat stress in early November

Plot Size: Plot size: 8 m by 8 rows at 15 cm row spacing.

Replicates: Three

Treatments

All trials were sown with small plot equipment and managed as per usual agronomic treatment. Grain yield was determined by machine harvest.

Trial Results

Table 1: Yield of peas in 2009 and long term

Variety/line	SOUTH EAST				
	2009			2000-2009	
	Bool Lagoon	Keith	Mun- dulla	% Site mean	Trial #
Bundi	126	83	98	103	17
Kaspa	92	83	78	107	24
Parafield	82	68	81	103	24
Sturt	101			107	21
SW Celine				109	9
Yarrum	107	128	99	117	15
OZP0601	80	80	108	108	9
OZP0602	82	89	108	110	9
OZP0703	98	89	102	113	9
Site mean yield (t/ha)	3.84	2.29	2.30	2.85	
% LSD (0.05)	15.6	14	7.4		
Date sown	24/6	11/6	22/6		
Soil type	C	SL	L/stone		
A-O rainfall (mm)	508	359	341		
pH (H ₂ O)	7.7	7.4	8.3		
Site stress factors	ht	ht, dl	ht, dl		

Peas

For the third year in a row the late flowering dun type pea Yarrum was the highest yielding variety across SA pea evaluation trials in 2009. Yarrum averaged 10% higher grain yields than Kaspa, 14% higher than the early flowering variety Bundi and 15% higher than Parafield across all sites.

Mean site grain yields of all fourteen NVT and Pulse Breeding Australia (PBA) trials ranged from 0.6 t/ha at the hail damaged Rudall site to 3.8 t/ha at Bool Lagoon in the lower South East. The average site yield across all trials was 2.7 t/ha, significantly higher than yields achieved in each of the three previous years.

Many commercial field pea crops in SA last year incurred high black spot infections due to early sowing and the late release of large numbers of airborne spores. SA Grains Industry Funded agronomic research trials in SA showed that the application of P-Pickel T seed treatment and two foliar sprays of mancozeb was economic in 2009 but some disease infection and yield loss still occurred. Early sowing (early May), due to a combination of black spot and frost, often resulted in lower or similar grain yields than delayed sowing (late May) in 2009. This was in contrast to results found in 2007 and 2008 where generally all earlier sown crops returned higher yields. Frost

events during flowering and pod fill also reduced field pea yields in some districts and a severe hail storm in late September caused widespread damage, yield loss and seed quality down grading to a number of crops on the Eyre and Yorke Peninsulas. Bacterial blight again caused some damage in frost affected crops east of the Clare Valley.

Pea variety performance last year, like in 2008, was variable across districts. This was due to different levels of disease (black spot) and heat and frost stress during grain filling occurring across sites. Blackspot levels were high at Turretfield, Balaklava, Snowtown and Minnipa resulting in reduced grain yields. Frost events were recorded at Laura, Lameroo and Snowtown, however only the Snowtown site exhibited obvious levels of yield loss. The later maturing sites of Riverton, Turretfield, Keith, Mundulla and Bool Lagoon all incurred high levels of heat stress during flowering and pod fill from the heat wave event in November. Lower levels of this stress and at a relatively later crop maturity stage were observed at Balaklava, Lameroo, Minnipa and Yeelanna.

Yarrum is resistant to powdery mildew and has improved resistance to virus. Yarrum had high relative yield levels at Laura, Riverton and in the South East in 2009. All these sites were characterised by low levels of black spot, good levels of plant growth but a rapid finish to the season due to heat stress. In previous years despite its late flowering characteristic, Yarrum has been found to handle the short and dry flowering and pod fill seasonal conditions better than other varieties. It has a late but very rapid flowering and pod filling window which often sees it reach maturity before earlier flowering varieties e.g. Parafield. Yarrum's poorest relative performances compared with Kasper in 2009 were generally at sites where high levels of black spot occurred. Long term grain yields show that Yarrum has its highest relative yield advantage over Kasper in the South East and Mallee districts (10-11%). It provides an alternative to Kasper in SA particularly in longer growing season districts where powdery mildew and viruses are regular problems provided black spot risks are reduced.

After three years of similar or lower yields, the cross-sites grain yield average of Kasper was 5% above Parafield last year, reflecting the more favourable growing conditions of 2009. Kasper's best relative yields were generally at the higher yielding sites and sites where black spot reduced grain yields. Despite a very low level of downy mildew being identified in SA in 2009 growers are reminded that Kasper's resistance to this disease has now broken down and an appropriate seed dressing is now required in disease prone areas.

OZP0602 and OZP0601 from PBA are 'Kasper' types with earlier and longer flowering periods and greater yield in short season environments and seasons than Kasper. OZP0602 has been higher yielding than Kasper at 29 of the 42 evaluation sites in SA over the last three years. It averaged 3% higher than Kasper across all sites last year and was the highest yielding early flowering cultivar. OZP0601 averaged 4% lower grain yields than Kasper across all sites last year and like another early flowering variety, Bundi it was generally not favoured by the seasonal conditions. Agronomic trials in SA have shown that due to their earlier and longer flowering windows OZP0602 and OZP0601 may not need to be sown as early as Kasper to maximise yields, providing a safer option where sowing needs to be delayed. OZP0703 is a high yielding early flowering dun variety with greater tolerance to bacterial blight (*pv syringae*) than current pea varieties. It averaged 10% higher than Kasper in 2009 and 17% higher in 2008 across all sites. These impressive results across two climatically different years indicate that this line may have a wider adaptation than just in bacterial blight prone areas. All three lines are currently under multiplication with AWB Seeds with a view to releasing them in 2010.

Table 2: Yield of lentils in 2009 and long term

Variety	SOUTH EAST		
	2009	2003-09	
	Mun- dulla	% site mean	Trial #
Aldinga		97	6
Boomer	82	107	6
Digger		97	4
Nipper	100	100	7
Northfield	84	94	7
Nugget	96	102	7
PBA Bounty	67	104	6
PBA Flash	125	111	6
Site mean yield (t/ha)	1.59	2.08	
% LSD (0.05)	11.3		
Date sown	22/6		
Soil type	L / stone		
A-O rainfall (mm)	341		
pH (H ₂ O)	8.3		
Site stress factors	ht, w		

Lentils

The newly released lentil variety PBA Flash performed exceptionally well in SA trials last year, topping the variety yields at seven of the eleven Pulse Breeding Australia (PBA) and NVT evaluation sites.

Very hot temperatures in early November following a cool spring meant many varieties with mid-late maturity failed to fully exploit the 2009 growing season in some areas. Sites in later finishing areas were still at the early podding stage when the November heat wave hit resulting in relatively poor yields and grain quality. Frost and cold temperature events during the flowering and podding stage also reduced yields in some areas, in particular the Adelaide plains district of the lower mid North. Conversely the upper Yorke Peninsula, being earlier maturing and experiencing a milder winter, had above average yields with sites averaging more than 3 tonnes per hectare. Several future PBA lines yielded in excess of 4 tonnes per hectare at the Willamulka NVT site.

The more favourable winter and early spring conditions allowed early sown lentil crops to produce high levels of plant biomass. Consequently, botrytis grey mould (BGM) was present in the majority of trial sites across the mid North and Yorke Peninsula. A very high level of BGM occurred at Riverton and Nipper's yield was double that of Nugget demonstrating its improved disease resistance. Agronomic research trials in SA last year confirmed the importance of a fungicide spray at canopy closure in favourable seasons.

PBA Flash and PBA Bounty were released at Paskeville last year. PBA Flash was consistently high yielding across all sites averaging 27 percent higher yield than Nugget.

PBA Flash is suited to all current lentil growing areas but particularly shorter season growing areas where it's higher yield and earlier maturity improves yield reliability, especially in lower yielding situations. PBA Flash is a red lentil characterised by a green seed coat similar to Aldinga. Growers need to be aware of the importance of maintaining seed purity when changing varieties or if growing varieties that differ in seed coat and/or cotyledon colour.

PBA Bounty is a broadly adapted small seeded red lentil with higher yields than Nipper and Northfield. In long term trials in South Australia PBA Bounty has out yielded Nipper and Northfield by 5 and 12 percent respectively when averaged across all sites. In 2009 PBA Bounty was higher yielding than Nugget by an average of 4 percent on the Yorke Peninsula, and 20 percent in the mid North. PBA Bounty does not have the equivalent level of foliar disease resistance of Nipper and has a different (prostrate) growth habit.

Boomer yields were comparable to Nugget at most sites in 2009. Prior to the release of PBA Flash, Boomer was the highest yielding commercial lentil variety in long term South Australian evaluation trials. Boomer's long term yields are 5-10 percent lower than PBA Flash across all regions of SA. Boomer's high biomass and early flowering were important traits contributing to high relative yield in the dryer and shorter seasons of 2006, 2007 and 2008. A more favourable growing season in 2009 resulted in Boomer producing excessive levels of plant biomass and lodging prematurely at many sites. Sowing Boomer crops early can increase lodging and result in smaller seed. Early harvest is important to prevent Boomer from shattering and to reduce the risk of seed discolouration.

Nipper performed as expected last year. Seasonal conditions were favourable for Nipper to produce a greater level of plant biomass than in previous years. Nipper's relative yields varied due to the incidence and intensity of BGM in trials. Nipper averaged 150 percent of Nugget's yield in the mid North where all sites were infected by BGM. Across SA Nipper was 10 percent higher yielding than Nugget with lower relative performance at Lameroo, Maitland and Minlaton. Nipper is best adapted to longer growing season environments where disease is more common and also provides a good option for early sowing. Some growers last year also reported that Nipper had lower levels of wrinkled seed coat than Nugget from rainfall at maturity prior to harvest. Grain assessment is occurring to validate this and other important quality characteristics in lentils.

In reference to the attached table, it is worth noting that the relative yields of currently grown lentil varieties are frequently much less than the site average (100%). This is due to the exceptional performance of many advanced PBA lentil lines across all sites increasing the site average yield. Many of these lines will be further evaluated in 2010 with the aim of releasing the best of them in the future to reduce the impact of climatic stresses such as drought and heat and enable profitable lentil production in most years.

Table 3: Yield of chickpeas in 2009 and long term

Variety	SOUTH EAST			
	2009		2000-2009	
	Moy-hall	Mundulla	% Site mean	Trial #
<u>Desi trials</u>				
Genesis 509	77	115	101	13
Genesis 079#	100	112	111	5
Genesis 090#	116	92	102	13
Howzat	109	89	104	13
PBA HatTrick	93	98	100	7
PBA Slasher	105	98	112	7
Sonali			102	11
Site mean yield (t/ha)	2.47	0.66	2.2	
% LSD (0.05)	13.8	22.7		
<u>Kabuli trials</u>				
Almaz	102	No Valid	95	9
Genesis 079#	96	Result	118	12
Genesis 090#	116	Poor	115	13
Genesis 114	95	estab-	99	9
Nafice		lishment	91	7
Site mean yield (t/ha)	2.12		2	
% LSD (0.05)	13.2			
Date sown	24/6	22/6		
Soil type	C	L/stone		
A-O rainfall (mm)	508	341		
pH (H ₂ O)	7.7	8.3		
Site stress factors	ht	ht, dl w		

Small kabuli type

Chickpeas

Extreme temperature stresses at the beginning and end of spring in many parts of SA did not favour chickpea production in 2009 and grain yields were very much lower than lentil, field pea and faba bean yields from the same sites.

Grain yields of the 9 NVT and Pulse Breeding Australia (PBA) desi chickpea trials ranged from 0.7 t/ha at Mundulla to 2.5 t/ha at Moyhall (both sites in the South East). Across the 8 kabuli trials site average yields ranged from 0.8 t/ha at Riverton to 2.1 t/ha at Moyhall and Minlaton with the Mundulla trial being abandoned due to low and variable yield.

Temperatures in late September and early October were below average in most areas of southern Australia. In particular daily mean temperatures were frequently well below the critical 15°C in chickpea (calculated by adding the daily minimum and maximum together and dividing by two), leading to abortion of flowers and pods particularly in earlier sown crops. Despite this, by the end of October the yield potential of most crops was still above average due to adequate winter and spring rainfall. However relatively lush crops with low levels of pod set were then subjected to sudden and record high temperatures in early November that led to rapid crop death and reduced yields and quality.

Adding to the above problem in some areas were frost events during flowering and pod fill and plant death from virus infection. Virus infections were generally more severe in thinner crops due to low sowing rates, less stubble, herbicide damage or poor soil. Pod drop at maturity was also a more significant issue than in previous years most likely due to a combination of brittle plants from the severe heat stress and strong wind events.

Variety performance at evaluation sites was mainly influenced by the previously mentioned temperature stresses. Ascochyta blight and botrytis grey mould disease infections were at low and moderate levels at Melton and Turretfield respectively. Significant levels of pod drop occurred at Riverton, Melton, Cockaleeche and Turretfield prior to harvest and the Rudall trial on the Eyre Peninsula was damaged by a severe hail storm at the onset of podding.

PBA Slasher is an ascochyta blight resistant desi line from PBA Chickpeas, licensed to AWB Seeds and was released at Paskeville in 2009. PBA Slasher, previously tested as CICA0503, was higher yielding than the desi types Genesis 509 (by 4%) and Howzat (by 13%) across all sites in 2009. It was also higher yielding than the small seeded kabuli line, Genesis 090, at 7 of the 9 sites averaging 13% higher. PBA Slasher was lower yielding than the small seeded kabuli variety Genesis 079 last year but long term it has similar yields to this variety and superior yields to all other varieties in SA. Along with high yields PBA Slasher has improved seed quality compared to the desi type Genesis 509, with larger seed size and superior seed colour. It will also provide a high yielding desi alternative marketing option to the small seeded kabuli varieties.

The highest yielding variety across all SA trials last year was the small seeded early maturing kabuli line Genesis 079. It was 15% higher yielding than Genesis 509 and 24% higher yielding than Howzat and Genesis 090. Genesis 079, as shown by its performance in 2009, offers high yields in SA particularly in short growing seasons or environments. It will be less suited to high rainfall and/or long growing season districts due to its early and more determinate maturity pattern than other varieties. Genesis 079 produces small 6-7mm sized grain compared with Genesis 090 which produces seed sized 7-8mm. Indications of grain price for Genesis 079 are that it will be at the lower end of the Genesis 090 price range.

Genesis 090 was generally lower yielding than PBA Slasher, Genesis 509 and 079 in 2009. The exception was the higher yielding Moyhall site where late November and December rainfall events were still useful for setting grain yield. Seed size of Genesis 090 was generally small and dark in 2009 due to the very quick and hot finish to the season.

In the kabuli chickpea trials Almaz and Genesis 114 (medium to large seeded kabuli types with intermediate resistance to ascochyta blight) were 21% and 24% respectively lower yielding than Genesis 090 across all sites. Yields of these two larger seeded types were similar in 2009 but long term yields show that Genesis 114 is around 5% higher yielding than Almaz in SA, particularly in the Mid North and Yorke Peninsula. The lower relative yields of the larger seeded kabuli types compared with desi and small seeded kabulis needs to be considered along with the chances of obtaining large seed size before deciding to grow these higher valued types.

Table 4: Yield of beans in 2009 and long term

Variety	SOUTH EAST						
	2009				Long term average across sites		
	Border-town	Bool Lagoon	Keith	Millicent	t/ha	% of Site Mean	No. Trials
Doza	99	102	91	-	2.38	93	13
Farah	100	104	109	106	2.61	101	43
Fiesta	98	101	109	89	2.56	100	46
Fiord	120	91	93	-	2.40	93	38
Manafest	-	84	-	82	2.27	88	44
Nura	97	92	79	98	2.51	98	43
Site av yield (t/ha)	3.64	4.83	2.19	2.94	2.57		
LSD (%)	10	8	13	17			
Date sown	May-15	June-5	June-11	june-9			
Soil type	L	C	SL	P			
pH (water)	7.9	6.7	8.1	8.0			
Apr-Oct rain (mm)	344	486	359	628			
Site stress factors			ht, wa	w			

Beans

Farah produced the highest average yield across the 13 NVT/Bean Breeding sites in 2009 and was the highest yielding of the current varieties at seven of the sites.

Of the current varieties Nura, Fiesta VF and Fiord were only marginally behind Farah with each performing well at individual sites.

Opening rains were sufficient to allow most of the sites to be sown in May, with sites in the South-East being sown into June.

Good rainfall in June and July enabled excellent establishment and growth through winter and into early spring, with some water logging being recorded at Keith. Well below average temperatures late September and early October were ideal for flowering and podding, however heatwave conditions in late October/ early November affected grain fill, particularly at the later sites in the South-East.

Sites average yields were well up on previous years and ranged from 1.6t/ha at Lameroo to 5.4 t/ha at Laura. In general faba beans performed very well in 2009 and were less affected by the heat and dry finish than other pulses. 2009 recorded less reports of poor podding than previous years.

Farah performed consistently well across the state, but was out-yielded by Nura at both sites on York Peninsula, and Pinery on the Adelaide Plains. Nura also performed well at the Charlick site (near Strathalbyn) as did the foundation variety Fiord.

The choice of which variety to grow for the majority of South Australia's bean growing districts falls between Farah or Nura, with Fiesta still in the mix. The older variety Fiord, although still yielding well, produces a small grain which threatens to down grade the larger, well sort after Farah, Nura and Fiesta types if mixed in the export market.

Farah is a direct selection from Fiesta, and it is identical in most respects to Fiesta, except for its moderate resistance to ascochyta seed staining and more uniform seed size and colour. Although the risk of suffering Ascochyta blight seed staining is reduced with Farah, the risk is still present if Ascochyta blight is not properly managed. Farah's yields are slightly higher than Fiesta and Nura, but has the advantage of an increased likelihood of achieving market standards for freedom of staining. Farah is licensed to PlantTech Pty Ltd and an end point royalty applies.

Nura is a medium-sized faba bean with moderate resistance to Ascochyta blight and rust, and intermediate resistance (MR-MS) to chocolate spot (better than Farah). All three resistance levels are better than Fiesta. It is susceptible to Cercospora leaf spot, similar to Farah and Fiesta. Nura is generally shorter in height than Fiesta and Farah, making it less likely to lodge but more difficult to harvest in lower rainfall districts or with late sowing. It has good seed appearance, light buff in colour, with minimal seed staining and discolouration. Nura flowers about 7 days later than Farah, but matures about the same time. Long-term yields have averaged about 6% below Farah, but Nura can take good advantage of early sowing, and highest relative yields are achieved when sown early. Its major advantage to growers is a likely reduction in fungicide sprays, with Ascochyta blight and rust protection only required in high risk situations. Seed is available from AWB Seeds.

Fiesta is early to mid flowering. It has a buff seed colour, larger than Fiord. Fiesta has good seedling vigour and is of medium height. It is classed as susceptible to chocolate spot but less susceptible than Fiord. Fiesta is more susceptible to Ascochyta blight than Farah and Nura and a proactive disease management strategy is recommended to ensure market standards for clean seed are met. Fiesta is no longer protected by PBR, and no end point royalty applies.

New varieties and potential releases

Doza is a small to medium sized faba bean released for the subtropical environments of northern NSW and southern Queensland. Doza has superior rust resistance to all current varieties, reasonable resistance to chocolate spot, but it is susceptible to Ascochyta blight and therefore not likely to have a role in southern Australia. Its combination of early flowering, high yield, rust resistance, uniformity of seed size and colour is a significant improvement over current varieties recommended for the sub-tropical northern region. Doza has good resistance to stem collapse from frost, an important trait in its target environment. It has been commercialised by Viterra and has an End Point Royalty. Over two years of testing in SA NVT and PBA breeding trials, Doza's yields have been well behind the local standards Nura, Farah and Fiesta. Seed size in the SA trials is also much smaller than local varieties, and only slightly larger than the small-seeded Fiord.

974*(611*974)/15-1 is a potential replacement for Manafest, with improved resistance to Ascochyta blight. Adaptation is similar to Manafest, with highest and most reliable yields in the South East, so its range is likely to be restricted to this region. Yields there are generally similar to Fiesta and Farah in seasons of low to average rainfall and significantly higher in years of high rainfall when nutritional problems such as iron deficiency chlorosis occur. A final decision to commercialise has not yet been made.

PBA Kareema, a new broad bean variety selected from Aquadulce, was released in 2009. PBA Kareema has similar adaptation to Aquadulce, but its seed is larger and more uniform in size, with no "evergreens". It has significantly improved resistance to Ascochyta blight (MR-R), better rust resistance (MR) and is slightly less susceptible to chocolate spot. The yield of PBA Kareema has been similar to, or slightly greater than, Aquadulce in trials in the Lower South East. It has been commercialised by Keith Seeds and has an End Point Royalty.

The contribution of data and information for this report from the Pulse Breeding Australia Faba Bean Breeding Program by Dr Jeff Paull, University of Adelaide, is gratefully acknowledged.

Table 5: Yield of lupins in 2009 and long term

Variety	SOUTH EAST				
	2009		Long term average across sites		
	Keith	Kybybolite	t/ha	% of Site Mean	No. Trials
Coromup	105	95	2.42	99	18
Jenabillup	104	103	2.61	107	10
Jindalee	77	68	2.29	94	50
Mandelup	109	122	2.54	104	42
Moonah	89	94	2.30	94	47
Wonga	72	82	2.33	95	49
Site Av. Yield (t/ha)	1.41	1.26	2.45		
LSD (%)	11	11			
Date sown	May-25	May-27			
Soil type	S/C	SL			
pH (water)	7.0	7.0			
Apr-Oct rain (mm)	359	473			
Site stress factors	ht	ht			

Lupins

For the third consecutive year, the new lupin variety Jenabillup challenged the dominance of Mandelup in the SA trial program, with another new variety, Corromup not too far behind. Neither of these new varieties is yet available in eastern Australia, however, leaving Mandelup as the clear best choice for all SA lupin growing districts for the present.

Most of the SA lupin NVT and breeding trials were sown around the optimum time of early to mid-May in 2009, with trials in the South East being sown towards the end of May. Site mean yields ranged from around 1.2-1.4 t/ha in the South East up to 3.2 t/ha on Lower Eyre Peninsula. The heat wave experienced at the end of October/ start of November caused an abrupt end to the season, causing severe stress to lupin plants trying to fill grain. The majority of lupin crops produced exceptional growth, but the hard end to the season resulted grain quality being small (and flat). This was particularly evident at the Spalding, Kybybolite, Mundulla and Keith sites. Diseases were not a major issue in lupin trials in 2009.

Mandelup and Jenabillup shared honours for top yielders in 2009, with the Corromup only being marginally behind. These have similar early flowering and maturity times, well-suited to the harsh cut-off to the 2009 growing season. These conditions were most unfavourable for the late maturing Jindalee variety, The abrupt end to the season effected developing pods at a number of sites. Jindalee averaged only 66% of Mandelup across all SA sites in 2009. Wonga also suffered under these conditions, but to a lesser extent, averaging 79% of Mandelup across the SA trials.

Notes on new varieties

Coromup was released in WA in 2006 for medium and low rainfall zones. It is a high quality narrow-leaved lupin, having large and uniform seeds with high protein, hence it has excellent attributes for de-hulling, producing high protein kernel meal for developing premium feed markets. Coromup is early maturing and has a good disease resistance profile that includes anthracnose and phomopsis stem blight. Coromup was reselected from a crossbred line for its improved tolerance to metribuzin, which is similar to Mandelup. In WA it is being promoted for its high quality (i.e. high protein) rather than high yields. In the absence of bonus payments for its higher protein, the main role for Coromup may be for on-farm feed use. While Coromup averaged only 87% of Mandelup in its first year of NVT testing in SA in 2006, average yields in the past three years have been on a par or just slightly below Mandelup. The long-term average for Coromup across SA is about 94% of Mandelup.

Jenabillup (WALAN2224) was released in WA in 2007, specifically for their southern districts where “black pod syndrome” (BPS) regularly reduces yields. Jenabillup has shown a greater tolerance and higher yields in the presence of this disorder than other varieties. The cause of “black pod syndrome” in WA is thought to be a physiological response to climatic conditions and soil moisture. Affected lupin crops are usually high in biomass and well-podded in spring. As the season finishes there appears to be a remobilisation of nutrients from the pods thus leaving the pods flat and black with small seed inside. “Black pod syndrome” has not necessarily been recognised elsewhere in Australia, although similar symptoms have been reported sporadically in SA. Jenabillup’s anthracnose resistance level is low (MS), similar to Kalya and Merrit. Yields in SA trials have been variable over the past 3 years of testing, from an average 90% of Mandelup in 2006, to 6% above Mandelup in 2007, and on a par with Mandelup in 2008 and 2009. The long-term average for Jenabillup across SA is about 103% of Mandelup. But Jenabillup has consistently outyielded Mandelup at several sites over the past 3 years, including Wanilla, and Keith, which may indicate specific environmental adaptation.

Small quantities of pedigree seed of Coromup and Jenabillup have been built up by the NSW DPI under strict anthracnose quarantine conditions for potential release by Viterra in eastern Australia. At this stage Coromup is unlikely to be released here, since there is no price premium for its higher protein seed. Jenabillup is likely to be released though, and will undergo seed bulk-up, for potential commercial release in 2011.

Lupin variety choices for growers for the next 12 months at least will therefore be restricted to the current suite of varieties.

Mandelup has the highest long-term average yields of all varieties (with the exception of Jenabillup) at all sites, with a 5 to 10% yield advantage in all regions, as shown in the long-term yield table. In addition to its yield advantages and very early maturity, Mandelup has moderate anthracnose resistance (slightly better than Kalya, but less than Wonga), is resistant to phomopsis stem blight and aphids, and is moderately resistant to CMV seed transmission. For brown leaf spot it is moderately susceptible, similar to Merrit. A potential weakness for higher rainfall districts is its poorer stem strength, giving a higher risk of lodging, although no evidence of this has been observed at wetter sites in recent years. Timely, early harvest of Mandelup is advised, to minimise the risk of pod splitting. Seed of Mandelup is available in SA through PlantTech Pty Ltd.

Wonga remains the best option currently available to SA growers wanting the highest levels of anthracnose resistance. Wonga’s yields have averaged around 9% below Mandelup.

Jindalee is the latest flowering and maturing variety currently available. It particularly suits early sowing in higher rainfall districts, where its vernalisation (cold) requirement prevents it from flowering too early. Jindalee can also respond to late spring rains, as shown by its good relative yields at Kybybolite and Keith in 2007, and across all sites generally in 2005. Jindalee's long-term yield performance ranges from 7 to 11% behind Mandelup across SA districts. Jindalee's anthracnose rating is MS, slightly less susceptible than Merrit. This level of anthracnose resistance is generally adequate though, if combined with seed testing, paddock monitoring and sound crop hygiene management.

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Funding Body

GRDC

The advertisement features a central image of a green field with a road receding into the distance. Overlaid on this are three pieces of equipment: a tablet on the left showing a colorful map, a yellow sensor unit in the center, and a steering wheel on the right. The background is a gradient of brown and orange.

Topcon Makes Variable Rate Easy

X20 MAPLINK

Mapping and VRC Software

- Up to 11 simultaneous active maps
- 5 logging layers plus elevation
- Layers can include prescription maps to control up to 5 tanks

CropSpec™

On-the-go Crop Canopy Sensor

- Application based only on crop need
- Prescribe and apply in a single pass
- Create prescription maps
- Largest sensor footprint in the industry
- Compatible with Topcon X20 Controllers

AES-25

Accurate Electric Steering

- Electric convenience, full hydraulic performance
- Fast, accurate steering response
- Up to 2 cm performance accuracy
- Convenient, simple installation
- Full terrain compensation

www.topconpa.com

TOPCON
Precision Agriculture