

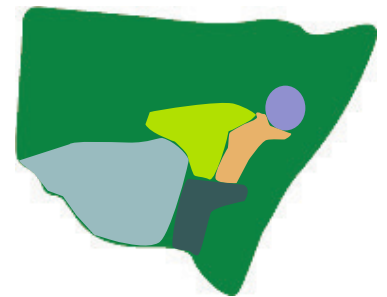
GRDC NORTHERN PULSE CHECK



The GRDC Northern Pulse Check project seeks to support and develop strong profitable pulse production systems across the GRDC Northern Region. It seeks to engage with grower, researcher, and industry stakeholders to encourage greater sharing of information, through a range of pulse related extension and communications activities.

FarmLink is working with Pulse Australia in co-ordinating the GRDC Pulse Check project across five GRDC sub-regions in NSW. To ensure local relevance and the best outcome for growers, local organisations have been engaged to facilitate the Pulse Check groups – **Liverpool Plains** - Heuston Agronomy Services; **Central West** - Central West Farming Systems, FarmLink and Heuston Agronomy Services; **Central East** - LLS; **South West** - Irrigated Cropping Council, the Irrigation Research and Extension Committee and Southern Growers; **South East** - Riverine Plains and FarmLink/LLS.

A summary of the 2019 season for each of the regions is provided inside, along with a market wrap and useful information about variety selection and grain storage.



"Raising the Pulse"

'Raising the Pulse' is a comprehensive report, provided by Pulse Australia with GRDC support to provide a platform for the pulse industry to capture opportunities and address challenges through to 2030. This link provides a summary of key findings of the report - <http://pulseaus.com.au/storage/app/media/uploaded-files/PA-PulseStrategy2019-A4.pdf>

Pulses were novel to Australia's cropping sector in the 1990s. After 30 years of development, enhanced by breeding and industry programs, pulse crops are now mainstream in Australia's cropping rotations, providing a valuable and sustainable source of protein, as well as holding an enviable reputation for quality in global markets. The commodity supply and demand scenario for pulse crops to 2030 looks healthy, albeit with some volatility.

Globally, consumer attitudes to diet, what they contain and where the ingredients come from

is changing rapidly. The consumer interest in healthier plant protein-rich diets is fast evolving, as evidenced by growth in high-profile meat-substitutes and the flow of investor capital.

Is the emerging food ingredient market a durable trend that delivers significant new markets for Australian pulse producers?

'Raising the Pulse' seeks to balance opportunities across the spectrum of pulse crop usage – from the staple food commodity pulses, through to high-value ingredients and isolates, as well as growth opportunities in the animal and pet food sectors.

The report examines the macro drivers of the global food industry over the next decade to determine whether increasing demand for plant-based protein is a fixture rather than a fad. A summary of the findings sheds light on the kind of opportunities and challenges that are emerging while assessing the current positioning of the Australian industry to

prosper in the future. Stakeholders across the value chain shared their insights and experience to ensure the findings of this review were of the greatest value to the industry.

Key findings

Megatrends driving global food markets are likely to favour increased consumption of plant-based protein. Pulses have a significant role to play in the rapidly evolving food markets demanding more plant protein.

Existing markets, in particular the sub-continent, will remain the backbone of the global pulse trade, while China and Africa will emerge to become even larger consumers. Animal protein production is likely to intensify and requires sustainable sources of feed, and plant protein, including pulses, will be a focus of most rations. Australian pulses have earned a strong position due to the breeding and supply chain focus on clean, quality grain with desired visual characteristics.

Around the regions of the GRDC Northern Pulse Check project

LIVERPOOL PLAINS

Rainfall - Gunnedah, YTD 232mm; LTA 477mm

The normally very reliable Liverpool Plains suffered the same fate as much of the rest of the cropping country in NSW with very few crops sown at all. This region grows a mixture of summer and winter crops including cotton, mungbeans, sorghum, maize, winter cereals, chickpeas and faba beans.

One of the few highlights in 2019 was the success of irrigated chickpea yielding 3.5t/ha, with only 1.8ML water/ha, double cropped into corn. Quality of the pulses lucky enough to be harvested was excellent and disease levels low, as predicted with the low rainfall year.

CENTRAL EAST

Rainfall - Gilgandra, YTD 210mm; LTA 558 mm

There were few pockets in the Central East NSW fortunate to get a crop, the centre of this was the Gilgandra/Armatree/Gulargambone districts. This area traditionally grows a mix of cereals, canola and pulse crops including Albus lupins, chickpeas, field peas and faba beans, along with some vetch for fodder.

The star pulse this year was the Albus lupins. Most of the crops suffered some frost damage, but yields of around 1.2t/ha and with a price of \$600/t, there was good profit to be made.

Disease levels were predictably low and chickpea yields were disappointing.

LAKE CARGELLIGO

Rainfall - Lake Cargelligo, YTD 199 mm; LTA 383mm

The 2019 season was of course a tough one at The Lake, but an okay start saw a mix of cereal and pulse crops grown, including some grazing options. There were some real positives for the pulse crops sown. Chickpeas, a relatively new crop to the region, all made it through to harvest. The same could not be said of the cereals with many of the these crops cut for hay. The chickpea yields were modest but better than expected at around 0.5t/ha

A number of vetch crops were sown for stock and these really filled a feed gap when the cereal crops were too small to graze. The lambs put on the vetch did very well with no toxicity issues as can be the case with other crops. Some field peas were planted in the area. Many of these didn't make it to harvest but provided useful fodder to hungry mouths!

Penny Heuston, Heuston Agronomy

CENTRAL WEST

Rainfall - Condobolin, YTD 144.2; LTA 417.9

What has happened this season? Well it just didn't rain. February was the only month in 2019 (to date) that received over 20 mm of rain and April recorded no rain at all. Condobolin has received just on one third of its long term annual rainfall and less than one third of its long term growing season rainfall (GSR – 1 April – 31 October). So what did growers do? They knuckled down, reduced their livestock numbers, planted a little bit of crop and hoped for the best.

How pulse crops fared compared to other crops? Very few pulse crops were sown in the area and their establishment was mostly unsuccessful.

Growers who have come along to various extension events, including the Pulse Check meetings are keen to include pulses in their rotations going forward, noting the benefits of soil health and nutrition and stock feed.

Helen McMillan, Central West Farming Systems

CENTRAL EAST

YTD (CliMate)	16th Dec	Median
Woodstock	387	628
Canowindra	364	581
Cudal	389	599
Greenethorpe	359	549
Cowra	303	582 4%ile
Cowra (Apr)	162	441 3%ile

In comparison: 82-83 was 113mm, 06/07 was 143mm, 57/58 was 153mm.

Good results with Vetch hay, yielding 4 tonne of high protein hay that will go back into their livestock enterprise. 0.6-0.8tonne/Ha of Chickpeas has been the best yields so far I have heard of around the district. 1.3tonnes/Ha of Faba Beans has been the best dryland yield I have heard of this year.

General comments from one agronomist is that farmers are increasingly seeing Barley, Lupins & Chickpeas as being a fairly safe production risk in low decile years.

Phil Cranney, Local Land Services

Beyond harvest – storing pulses

Storing pulses successfully requires a balance between ideal harvest and storage conditions. Harvesting at 14 per cent moisture content captures grain quality and reduces mechanical damage to the seed but requires careful management to avoid deterioration during storage. A series of pulse storage workshops were held throughout many of the Pulse Check areas in 2019, but additional information and tips are available via <https://storedgrain.com.au/storing-pulses/>



SOUTH EAST and CENTRAL WEST

2019 season was challenging on a number of fronts but some positives included excellent local pulse trials at Rankin Springs and Methul as part of the GRDC funded Pulse NVT and Breeding Trials Network managed by NSW DPI. Lentils, Faba Beans, Field Peas and Chickpeas performed well under difficult growing conditions. Trial sites showed how pulses can perform under good management. In the paddock across the region lupins benefited from the warmer start to the season and produced

SOUTH EAST

In the Riverine Plains region, most areas were Decile 1-2 with the growing season rainfall averaging around 200mm. There was enough rain to harvest some pulses, while a lot of canola was baled. Barley was the best performing crop in the low rainfall year.

At Rand, the growing season rainfall was 152mm, while summer rainfall was 52.3mm. Side by side, beans yielded 600kg/ha, while lentils yielded 200kg/ha. Based on French and Schultz, evaporation of 90mm, the water use efficiency was 7.6kg/ha/mm for beans and 2.5kg/ha/mm for lentils. Closer to Mulwala and Barooga, beans yielded slightly better at 800kg/ha and lupins yielded 1t/ha.

Harvesting beans was problematic and lots of pods fell on the ground because there was not enough material to push beans through the header. Lentils were also difficult to harvest, being very low to the ground. There were reports that headers needed to be cleaned down regularly to prevent header fires from dust particles.

Kate Coffey, Riverine Plains

SOUTH WEST

Rainfall - Griffith YTD 268mm; LTA 403mm

Due to a second consecutive year of very low general security water allocations (6%), there was limited area planted to irrigated winter crops. The Murrumbidgee region usually grows a mixture of summer and winter crops including cotton, rice, maize, winter cereals, canola and faba beans. This season many opted to cut winter crops for hay. A highlight for pulses in the region was a fully irrigated faba bean crops at Widgelli. The Bendoc seed crop was sown on May 23 and watered up using 1 ML/ha. It had four spring irrigations, using around 0.6ML/ha/irrigation, for a total water use of 3.4ML/ha for the season. Yield was 4.25t/ha which was disappointing when compared to a neighbour's faba bean (Samira) crop which was planted 10 days earlier and yielded 5.25t/ha. Smaller seed size of Bendoc seems to be the difference in yield between varieties.

Iva Quarisa, Irrigation Research and Extension Committee

reasonable biomass in paddocks that had good fallow weed management.

Final yields were disappointing although respectable given the season.

The greatest benefit we have seen from pulses in 2018 and 2019 is that the cereal and canola crops that are performing the best across the region are all on the back of Pulse crops or have had pulses in the rotation. The contributing factors producing these results are -

- the stored water often left behind after the pulses as they

generally sit in a lower water use or early finish category compared with other crops.

- the nitrogen available as a slow feed over the subsequent crops tends to produce higher or more consistent yield over similar crops using urea as the nitrogen source.
- improved weed control after pulses, in particular grass weeds like ryegrass/brome/wild oats are at very low levels after well managed pulse crops. In some cases we are seeing paddocks that do not require any grass weed control.

Hayden Thompson, FarmLink

SOUTH WEST

Faba bean plantings were down this year as most growers choose to pre-irrigate and get the crop sown in late April/early May. With water trading at around \$500/ML, pre-irrigation of around 1 – 2 ML/ha was deemed uneconomic. Particularly as you are then committed to irrigation in spring and the seasonal outlook was not positive, hence it was expected that spring allocations would be low (or non-existent) and water expensive. Some growers did retain pulses (or technically legumes) in their rotations using vetch.

Growing season rainfall was well below average, with 152mm at Deniliquin compared with an average of 208mm, exacerbated by very low totals in August, September and October (28.2mm cf. 98.1mm ave).

Many dryland crops on the heavier soils failed to amount to anything. Faba bean yields ranged from 0 to 4 t/ha and vetch hay 0 to 6 t/ha depending on the level of irrigation received. As a rough summary of faba bean crops, either pre-irrigation and one spring irrigation or sown on rainfall and 2-3 spring irrigations ended up close to 4 t/ha. The faba bean crops that didn't get fully irrigated saw bean size decrease but still filled out rather than produce shriveled beans. Most are surprised at how well the crops did with limited water. Some lighter soils saw faba beans hang on to produce 1 t/ha of small but reasonable No2 beans. There was a lot of discussion about variation in rainfall across the district. Smaller canopies from later sowings yielded comparably with early sown bulky crops. The conundrum is by pre-irrigating, larger canopies result, using more water to simply sustain the leaf area rather than create yield. A general comment from growers is that the high biomass areas didn't seem to produce all that more than "poorer" areas.

We have done some trials this season with fabas looking at pre-irrigation or not followed by 1 spring or full spring irrigation. The trials are harvested and at this stage, results suggest pre-irrigation was critical for establishment and setting yield potential. Poor establishment plus spring irrigation results in a lot of weeds!

Damian Jones, Irrigated Cropping Council

Pulse variety selection

CHICKPEA

There are two distinct types of chickpea grown in Australia: desi and kabuli. Desi chickpea has relatively small, light brown angular seeds that are used for split pea (dhal) or for flour after the hulls are removed. Desi varieties are most widely grown under dryland production in Queensland and northern New South Wales.

Kabuli chickpea is more rounded and creamy-white in colour, and generally much larger in size than desi chickpea. Kabuli chickpea is usually sold whole, so seed size and appearance is critically important.

New Desi Varieties include

PBA Seamer (2016). Suitable for central and northern NSW. Moderately Resistant (MR) to Ascochyta Blight in the north, but susceptible (S) in the south and moderately resistant (MR) to Phytophthora Root Rot. Similar yielding to PBA HatTrick in the absence of disease, but significantly higher in the presence of AB. Semi-erect plant type with good lodging resistance at maturity. Early to midflowering and mid-maturity. It is not considered an option for southern NSW where other current varieties are higher yielding.

PBA Drummond (2018). High yielding in central QLD and first year of testing in northern NSW in 2018. Susceptible (S) to AB in the north and south. Susceptible (S) to PRR. No previous yield evaluation in NSW. An erect plant type with a medium seed size.

New release 2021 *CICA1521 (PBA)*. High yielding in northern NSW in 2015 to 2017. Moderately resistant/moderately susceptible (MR/MS) to AB in the north and MS in the south. Moderately resistant (MR) to PRR.

New Kabuli varieties include

PBA Royal. New release. Higher yielding to Almaz in northern NSW but similar to Genesis™ 090 in the south. MR to AB in the north and MS in the south. Early to mid-flowering and maturity. Seed size mostly 8 mm and larger than Genesis™ 090.

<http://www.pulseaus.com.au/growing-pulses/bmp/chickpea>

FABA BEAN

Many dryland and irrigated grain growing areas are well suited to faba bean. All varieties are suitable for stockfeed or human consumption. At present there is considerable demand for export to Egypt and Middle East.

New varieties include

PBA Nanu (2018). A new variety for the northern region and highest yielding in the state's north-west. It has good overall resistance to disease

and is MR/R to rust and MR to Bean leafroll virus. It is similar to other northern varieties and is MS to chocolate spot. Licensed to Seednet.

PBA Bendoc (2018). The first faba bean variety with tolerance to imidazolinone herbicides. A minor use permit is currently available for applying imazamox and a further permit for an additional herbicide is being sought for 2019. PBA Bendoc is adapted to southern NSW, Victoria and SA. It is MR–R to both pathotypes of ascochyta blight, but susceptible to chocolate spot. It is later than Fiesta VF and Farah, and flowers at the same time as Nura and PBA Samira. Seed is a similar size to Nura, and suited to the Middle East market. PBA Bendoc is not recommended for northern NSW as it is not adapted to the short growing season and is S to rust. Very limited data for southern NSW and irrigation. Licensed to Seednet.

PBA Marne (2018) is adapted to the lower rainfall or shorter season environments of southern NSW, Victoria and SA. It is MR–R to the old pathotype of ascochyta blight, but MR–MS to the new pathotype found in SA. It is more resistant to rust than other southern varieties and is classified as MR. However it is S to chocolate spot. PBA MarneA has good stem strength and standing ability. Seed is similar in size to PBA Samira and should be suitable to co-mingle with other major varieties for Middle East market.

PBA Amberley (2109) adapted to the high rainfall areas of southern NSW, Victoria and SA. It is also suited to southern irrigation areas. It is mid-season flowering, medium plant height and maturity is similar to PBA Samira and PBA Zahra. It is R to pathotypes 1 and 2 of ascochyta blight, and is the most resistant of all varieties to chocolate spot. Excellent standing ability and low level of "necking" in most situations. Seed size is similar to PBA Samira and suited to the Middle East market. Commercialised by Seednet.

<http://www.pulseaus.com.au/growing-pulses/bmp/faba-and-broad-bean>

LENTILS

Lentils grown in Australia are divided into two groups – red and green – based on cotyledon colour. Each type has a distinct end uses and different markets. Lentil fits well into cereal based cropping systems, particularly when stubble is retained, with minimal additional machinery required.

New variety is *PBA Hallmark XTA* is the highest yielding herbicide tolerant red lentil variety across Australia. It is broadly adapted, with 5-6% higher yields than PBA Hurricane XTA across the main lentil production regions in

Victoria and South Australia.

<http://www.pulseaus.com.au/growing-pulses/bmp/lentil/southern-guide#Varietyselection>

FIELD PEAS

Field pea (*Pisum sativum* L.) is used both as animal feed and for human consumption.

There are four groups of field pea – blue, dun, maple and white – which have different growth requirements, markets and end-uses. Australia produces mostly dun-type field pea (including 'Kaspa' types), with some minor production of blue and white types.

New variety *PBA Butler (2017)*.

Kaspa-type seeded variety rated moderately resistant/moderately susceptible (MR/MS) to bacterial blight, equal to PBA Oura. Mid-late flowering with early-mid maturity, erect, semi-dwarf, semi-leafless type. Moderately susceptible to downy mildew. High biomass production and excellent yields in good environments. Marketed by Seednet

<http://www.pulseaus.com.au/growing-pulses/bmp/field-pea>

LUPINS

Lupin is the largest pulse crop grown in Australia, having a strong domestic as well as export market. There are two types of lupin grown in Australia – Australian sweet lupin and albus lupin – which have different growth requirements, markets and end-uses. The main type grown in Australia is the Australian sweet lupin (*Lupinus angustifolius*), which is also known as narrow-leaf lupin, the vast majority of which is grown in WA. A smaller area of albus lupin (*L. albus*), is grown in all 3 Australian grain growing regions.

PBA Bateman (2017) offers yield improvements over current varieties particularly in the eastern cropping zones of NSW where virus infection from Cucumber mosaic virus and Bean yellow mosaic virus can cause significant yield loss in susceptible varieties when conditions are conducive. Commercialised by Seednet, protected by PBR.

Murringo (2018). Murringo is mid-flowering with moderate resistance to Pleiochaeta root rot and Phomopsis. Like Luxor and Rosetta, Murringo is susceptible to anthracnose. It has grain quality characteristics that make it well-suited to the existing albus markets for human food and animal feed. The seed size is large (larger than Kiev-mutant and Ultra but not as large as Rosetta, similar to Amira and Luxor). Commercialised by Seednet, protected by PBR.

<http://www.pulseaus.com.au/growing-pulses/bmp/lupin>