



Chickpeas – 'top dog' for southern irrigators

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in a nutshell

- Chickpeas are establishing a firm place in cropping rotations in southern New South Wales due to new varieties with improved disease resistance
- Chickpeas offer a good alternative to other cropping options with the ability to handle very hot conditions during flowering and pod fill
- Chickpeas have proven to be a profitable part of a rotation for a mixed farming business near Deniliquin

Irrigated chickpeas have had an established place for many years in northern New South Wales in rotation with cereals, cotton, sorghum and other grains, but it has only been in recent times that they have been grown in the south of the state. A combination of new varieties with better disease resistance, very high prices and good water use efficiency has been the key driver for southern growers taking on chickpeas.

In 2004, seed crops of the new variety Genesis 090 were first grown under centre pivots in southern NSW near Griffith, along with one other crop at Hillston and a demonstration trial on beds at Coleambally. The area of chickpeas has increased dramatically since then to nearly 400 ha under overhead irrigation at Hillston and a crop near Mathoura in the Murray Valley. The predominant variety grown was Flipper, a new desi variety bred at Tamworth with good *Ascochyta* resistance and some outstanding yields ranging from 2.3 to 4.2 t/ha, with prices in excess of \$500/t.

Southern success

Todd Peach of Agronomic Business Solutions at Hillston was the consultant to the growers of the crops mentioned above. He believes that the high yields were due to "attention to detail and timing in all agronomy aspects, underlined simply by water management especially (as always) the volume applied". He also said that moisture monitoring with neutron probes took place on most crops grown, and notably on the highest yielding one.

The biggest advantages in growing chickpeas were the new varieties with improved *Ascochyta* blight resistance; the disease management packages that now make them safer and cheaper to grow; and their value as a rotation crop, particularly as an alternative to canola, with their innate ability to handle the very hot conditions during flowering and pod fill that are common place out west.

The lack of tolerance of chickpeas to waterlogging and the

lack of information relating to irrigation management was an issue for growers in southern NSW, as was the limited data on row spacing and irrigation plant populations. However local growers are doing their own trials to see where the best gains can be made and supported by NSW DPI who are conducting trials this year.

The future for chickpeas under sprinkler irrigation is very strong and positive according to Todd and the growers while prices remain buoyant. A large area is being grown again in 2007 with some crops under full irrigation, others partially irrigated and some dryland crops. The results will be very interesting for assessing the ability of chickpeas to extract moisture from the soil profile with the various water applications, and to show their excellent water use efficiency in achieving high yields.



Figure 1: A chickpea crop establishing in the Murrumbidgee Valley in 2006



Murray Valley case study

Irrigated chickpeas were an outstanding success for Luke and Kate Barlow of Womboota near Deniliquin. The couple had previously grown the crop but this was the first time under sprinkler irrigation.

The Barlows' property *Pine Farm* covers 1000 ha and has access to 1020 ML of water delivered through the Moira Private Irrigation District. They also farm Luke's parents' property of 1150 ha and lease a further 700 ha.

In 2005 Luke and Kate removed the lasered irrigation area on a 170 ha block at *Pine Farm* and installed a Valley lateral move irrigator, as well as building a storage dam with full drainage and recycling facilities.

The soils on the property vary from sandy red brown earths to heavy grey self-mulching clays, and are suitable for growing a wide variety of summer and winter crops. The cropping program consists of 30% break crops and 60% cereals. The break crops are canola, faba beans, field peas and chickpeas, while the cereals are usually half wheat and barley.

In addition to planting 900 ha of winter crops this year, Luke and Kate are running 600 Merino ewes joined to Poll Dorset rams. The ewes run mainly on dryland lucerne, but also on stubbles as soon as possible after harvest. Lambs are sold to local markets as suckers or shorn and fed on to supply over the hooks contracts for heavy export markets. Luke also tries to buy light lambs and grow them out over summer when all his own bred lambs have gone. The program is loosely based over three months and allows Luke to harvest, fatten lambs over summer and then prepare his own ewes for lambing by mid March. The growing of faba beans has enabled Luke to graze stubbles and supplementary feed his lambs on the beans to achieve excellent weight gains.

Chickpeas in 2006

After a great faba bean crop in 2005, Luke was keen to grow more beans under the lateral irrigator in 2006, however seed for the new faba bean variety Nura was scarce and only 40 ha was sown with a further 30 ha being sown to Genesis

090 and Genesis 425 chickpeas. The remaining 100 ha under the irrigator was sown to Arrivato durum wheat as Luke wanted to take advantage of any residual nitrogen that the beans had left behind in the previous year.

Genesis 090 chickpeas were chosen as they were a new variety more suited to the southern region, with its better Ascochyta resistance. Luke had previously grown Amethyst (desi) chickpeas with varied results and after a total crop loss from Ascochyta, he removed chickpeas from his rotation. Last year however, he saw the establishment cost of chickpeas as an advantage over canola, and the potential returns were competitive with canola now that new small kabuli types offered a better disease package and higher value.

After talking to Trevor Bray from Pulse Australia at a grower field day in Deniliquin, Luke secured a seed contract with Australian Agricultural Commodities (AAC) for Genesis 090 and Genesis 425 chickpeas. The area under the lateral irrigator was selected to grow this crop, as it consisted of more grey than red soil, had no herbicide residue problems, and soil pH levels were suitable, being above the minimum requirement of 5.2 (CaCl₂).

Irrigation

The irrigation plan was to pre-water the area but not water after planting – in order to minimise the risk of disease. The possibility of limited spring irrigations was left open, in case supplementary moisture would be required to maintain pod development and seed size. Seed size was a crucial point to consider as kabuli chickpea prices are generally dependent on size, as well as the fact that this was a seed crop for AAC.

Sowing

The crop was planted 17 May into full moisture after a pre-irrigation of 54.5 mm and rain from January to April. Sowing was delayed by about 10 days as a heavy infestation of weeds germinated after watering and Luke wanted to get the best possible clean up prior to planting – knowing there were limited options for post emergent spraying in chickpeas.



Figure 2: A dryland chickpea crop at Pine Farm near Deniliquin this year - where growers Luke and Kate Barlow have had success with chickpeas on both dryland and irrigation

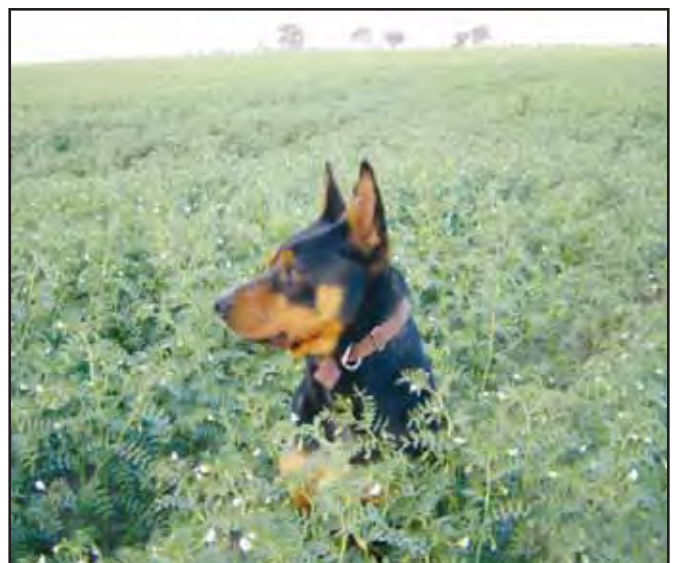


Figure 3: Luke and Kate Barlow's dog Reg thinks chickpeas are great - as do his owners



Luke's Horwood Bagshaw airseeder has been customised with double disk openers to sow the seed while still retaining the tynes for incorporation of herbicide and allowing him to place fertiliser in a band below the seed. The seeder can sow on 7 inch or 14 inch row spacings simply by moving levers on the triple bin seeder box.

The field was bare of stubble due to fallowing and could have been sown at 7 inch spacing but Luke chose 14 to enable better air flow between plants and in future to sow into cereal stubbles for better clearance.

The Genesis chickpeas were inoculated and sown at 120 kg/ha seeding rate with 160 kg/ha of grain legume super. A test strip was trialled on 7 inch spacings to see if there was an advantage in achieving early canopy closure, thereby preventing evaporation due to wind and sunlight. The results at harvest, showed no visible difference in yield.

Trifluralin was applied just prior to planting at 1.5 L/ha and incorporated by sowing. A tank mix of simazine at 1 L/ha, Balance® at 100 mL/ha and Talstar® at 75 mL/ha was applied post sowing pre-emergence. A Lemat® insecticide was required four weeks later for aphids. Verdict® was applied at 100 mL/ha with Uptake® oil for grass weeds at the start of August. There was only one fungicide application of Polyram® at 1.5 kg/ha (as recommended) for possible Ascochyta pod infection, and this was able to be combined with a heliothis insecticide during mid September.

Harvest

Luke used a Case IH axial flow header fitted with a 1010 rigid front with pickup finger reel to harvest the crop. He harvested the crop at night and was very surprised at the ease of harvest, with minimal loss from pod shatter. He had had trouble in the past with pod loss at the knife and made modifications to help with this, however this is generally in low and thin crops where pod loss is sadly unavoidable.

The chickpea crop averaged 3 t/ha which delighted Luke, as previously a 1 t/ha crop was seen as a good result. Prices in 2006 were at an all time high – in excess of \$500/t making for the highest gross margin of all crops grown. The residue from directly behind the header was baled and sold into the drought feed market and proved to be a valuable commodity in itself. All in all, Luke was pleased with the result of the Genesis 090 with 90% of the grain testing over 8 mm in diameter.

Luke and Kate now believe that the chickpeas may have a bright future as water availability continues to decline. They grow well without water but it is an advantage to sow them into moisture early and irrigate them later to guarantee pod set, seed size and yield.

Added value of stubble

Luke was also surprised when he turned Merino wether lambs onto the field to graze the stubbles under the lateral as they stayed in the chickpea area until nothing was left. While the lambs also had access to faba bean or wheat stubbles, it was as if there was a fence separating the zones of these stubbles and the chickpea stubble. Although the chickpea zone appeared bare, the lambs continued to gain weight while they were in this area without supplementary feed.

Water use

Another interesting point was the comparative water use of the winter crops at *Pine Farm*. Wheat used 2.6 ML/ha for a yield of 5.5 t/ha, the faba beans used 1.8 ML/ha for a yield of 2.0 t/ha (5.5 t/ha in 2005) and the chickpeas used 1.7 ML/ha for a yield of 3.0 t/ha.

The faba beans had an obvious problem early and were diagnosed with bean leaf roll virus carried in by aphids during the dry autumn from nearby lucerne crops, so irrigation ceased on that zone in September. Luke expected the water use for the faba beans would have been 2.6–2.8 ML/ha given that the wheat used 1 ML/ha for the remaining same period. The beans proved to be yield negative, but a smart decision by Luke to grow forage sorghum over summer for hay on the bean stubble utilising the residual nitrogen helped turn the overall result around.

The water use figures seem high but looking back at 2006 there was very little rain – totalling 118.5 mm through the growing season (18 May–7 Dec) coupled with high winds and high temperatures combined to increase water demand from high biomass crops. In an average year the water use figures for these crops have been around half that of 2006.

Into the future

Wayne Marchment, Senior Agronomist with IK Caldwell & Co, believes that chickpeas have the potential to be the break crop many growers in the Murray Valley have been looking for.

“We have been crying out for a break crop around here for years and chickpeas have big potential as both an irrigated and dryland pulse. Soils are quite variable in the region and selecting a paddock that has suitable soil type and low weed burden will be the key to success, along with the grower's ability to manage the crop and market it,” he said.

Luke grew chickpeas again in 2007 but only as a dryland crop due to herbicide residues preventing them going into the area under the lateral irrigator. However a recent grower meeting conducted by IK Caldwell & Co visited Luke's farm and showed everyone the obvious rotation benefit that Luke was getting with the exceptional wheat crop now growing on the 2006 chickpea stubble.

Luke and Kate are already planning for a considerable irrigation area in 2008 and more dryland chickpea area as well. With their current dryland chickpea crop looking great, the signs are there for good potential in the future for both dryland and irrigation crops. With good management and continued high prices, the Barlows are quietly optimistic of yet another financial success with these “little golden nuggets” called chickpeas. 🌱

Further information

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