

Chickpeas well suited to cotton farming systems

By John Slatter and Mike Lucy

Chickpeas are playing an increasingly important role in cotton farming systems — including as trap crops. But new varieties, better management techniques and strong prices mean chickpeas can now provide all the benefits of a legume rotation — and make money as well. We asked a couple of experts for some tips on chickpea management for profit.

Chickpeas have shown that they are well adapted to irrigated cotton farming systems. They are obviously suited to the black and grey cracking clays, planting in wider rows of up to one metre and respond to good management.

The management system recommended for chickpeas is second only to cotton and the gross margins that can be achieved are also similar.

There are a number of situations where cotton growers are considering chickpea this season:

- Chickpeas are financially attractive due to their combination of high yield potential and current high prices (averaging over \$400 per tonne for the past four years).
- As a rotation crop for fields that would benefit from a rest from cotton.
- To utilise remaining water held in on-farm storages that may otherwise evaporate. They are relatively water efficient, and provide a good return in terms of dollars per megalitre.
- The ability of chickpea to effectively utilise soil moisture reserves.
- They contribute to soil nitrogen, improve soil tilth and build up VAM levels.

Like cotton, good chickpea crops are very dependent on a specific management package that has been developed for the crop.

Paddock selection

Good drainage is essential, and growers need to ensure they have good layout and high volume beds for chickpeas. Isolation from last year's chickpea (including trap crops) will reduce the risk of ascochyta infections.



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An irrigated crop of chickpeas on cotton country at Norwood, Moree

Variety selection and seed treatment

The decision of which variety to plant will be determined primarily by market opportunities, disease risk and agronomic features of the variety.

For desi chickpeas, our main crop, the industry mainstay has been Amethyst. But the two new varieties — Jimbour and Howzat — should be preferred due to their greater yield potential and higher levels of disease resistance.

Growing the higher value kabuli varieties is an option but not recommended due to their lower yield potential, poor disease resistance and the difficulty in meeting the quality specifications in the northern region. Growers considering this option should first contact potential buyers to determine the market and recommended varieties.

The disease rating for current varieties is in shown in Table 1 and further information can be obtained from the seed suppliers, agronomists and regional crop management guides.

All seed should be treated with P Pickel T for the control of seed borne ascochyta blight and botrytis and also protection against soil borne fungi.

For growers needing to purchase seed, Pulse Australia conducts an “Industry Recommended Chickpea Seed Scheme”. This is seed from paddocks where ascochyta has not been detected, including an independent pre-harvest inspection, nor detected in the harvested sample, and treated with P Pickel T. The suppliers of this seed are listed on the Pulse Australia web site: www.pulseaus.com.au

Broadleaf weed control

Weed control in chickpeas is dependent on careful selection from a range of pre-emergent herbicides — much the same as in cotton. This strategy needs to be planned out well in advance of planting time. Inter-row cultivation and shielded or directed spraying are also very cost-effective options.

Sowing time

Depending on area, mid May to mid June is the prime planting period. Check regional management guides.

Sowing method

The use of row crop planters with row spacings



Chickpeas in pod

TABLE 1: Pulse Australia national disease rating system

Rating	Description	Ascochyta	Phytophthora	Wet mould	Botrytis grey mould
1	Highly resistant				
2	Moderately resistant		Barwon, Novita, Jimbour	Gully	
3	Moderately resistant		Howzat		
4	Intermediate				Howzat, Jimbour, Tyson
5	Moderately susceptible	Howzat	Amethyst, Gully, Sonca, Heera		Amethyst, Sonca, Heera, Barwon
6	Moderately susceptible	Jimbour, Amethyst, Sonca, Tyson	Garnet, Bumper, Karha, Tyson	Amethyst, Sonca, Heera, Tyson	Novita, Gully, Bumper, Garnet, Karha
7	Highly susceptible	Bumper, Karha, Garnet, Novita, Barwon, Gully		Bumper, Karha, Garnet, Novita, Barwon, Jimbour, Howzat	

TABLE 2: Gross margin budget for irrigated chickpea

	Number of operations	Cost/Unit	Cost/ha (%)	Year estimate
Glyphosate				
Follow spray	1 x 2L/ha	\$5.50/L	6.60	-
Planting	1	\$4.50/ha	4.50	-
Grounding (own equip)	6	\$2.00/ha	12.00	-
Harvesting (contract)	1	\$40.00/ha	40.00	-
Transport				
(100km contract)	1 x 1.3t/ha	\$10.00/tonne	13.00	-
Labour cost	1	\$10.00/ha	10.00	-
Planting seed (treated)	30kg/ha	\$1.40/kg	70.00	-
Inoculum	1	\$300/100kg of seed	1.35	-
Simazine (FSPE)	1.3L/ha	\$6.00/L	9.00	-
Irrigation water	2.5ml	\$25	62.50	-
NPV Insecticide + Am Insecticide	1 x 0.375L/ha	\$70.00/L	27.00	-
Larvin 375 @	1 x 0.75L/ha	\$25.00/L	18.75	-
Agonomist	1	\$4.00/ha	4.00	-
Total Variable Costs (\$/ha)			\$278.70	-
Yield: (2.5t/ha): Price: (\$450/tonne)				
Gross Income (\$/ha)			\$1125.00	-
Gross Margin (\$/ha)			\$846.30	-

of 50 to 100 cm is strongly recommended for both rain grown and irrigated chickpea. The main frustration can be the high sowing rate and smaller seed boxes, but this is offset by a more uniform plant stand which will assist greatly with later management — particularly heliothis management and harvesting. Planting rate should aim at 25–30 plants per square metre. Very high populations can accentuate lodging problems on one metre row spacings.

A sowing depth of 5–8 cm is considered ideal particularly when using one of the post sowing, pre-emergence herbicides. Crop safety with these products is based on physical separation of the seed from the chemical 'blanket'.

Sowing depth can be as deep as 12–15 cm if it is necessary to chase moisture. If forced into a deep planting, ensure that only high germination and vigour seed is used and this should be confirmed with an "Accelerated Aging Test".

Disease management

The four main diseases and their potential impact are:

- **Ascochyta blight**

The most publicised disease since it was first detected in Australia. The past two winters have experienced below average rainfall and the levels of ascochyta have been relatively low. This has the potential to create complacency within the industry. And if the season suits ascochyta, we could see the crop losses and expensive control measures similar to those experienced in 1998 and 1999.

The best means of defence against ascochyta is prevention, which includes:

- Selecting varieties with a rating no greater than 6 or 7 (Table 1);
- Treating the seed with P Pickel T;
- Planting away from last year's chickpea field; and,
- Following the management strategy suited to your situation and chosen variety.

Full details are in the joint Queensland DPI, NSW Agriculture and Pulse Australia regional "Chickpea 2002" management packages.

- **Phytophthora root rot**

This is unlikely to be a major problem in most cotton country unless there has been a history of scattered medic over the past 3–4 years. If there



A crop of irrigated chickpeas (variety Jimbour) in flower at Surat.

is any risk, select varieties with a rating of 4 or 5.

- **Virus diseases**

These are usually of low incidence, except in some higher risk areas such as the Liverpool Plains, where the variety Gully may be the best option.

- **Botrytis grey mould (BGM)**

This is most likely to occur in very vegetative crops that have canopied-over by flowering. The fungicide program recommended for ascochyta appears to have reduced the incidence of this disease, but close monitoring is still required, especially during flowering. BGM can cause high levels of flower abortion if present during September–October.

Crop monitoring and scouting

Pulse Australia, Queensland DPI, and NSW Agriculture conduct “Accredited Chickpea Agronomy” courses. All chickpea growers are encouraged to use the services of an agronomist who has undertaken this course, as they have received training in all aspects of chickpea management. By late April, over 200 agronomists will have completed the seven courses held from Emerald to Dubbo.

The list of these agronomists can be found on the Pulse Australia web site www.pulseaus.com.au

Apart from the general agronomy issues, close monitoring and timely control measures are essential for the management of ascochyta, botrytis and heliothis in particular.

Heliothis management

All chickpea growers are being encouraged to base their heliothis management strategies around the use of NPV viral insecticides. This requires careful monitoring of the crop and targeting of small larvae (often on below threshold populations).

This strategy is aimed at minimising the build up of resistance to conventional insecticides (such as carbamates) early in the spring–summer period.

Irrigation

Chickpeas are very sensitive to waterlogging, so good drainage is essential for both raingrown and irrigated crops. For irrigated crops the best practice is to pre-water to ensure a full profile. Many growers have successfully irrigated

chickpeas, but irrigation should only be carried out if there is no likelihood of rain, and on fields that drain quickly.

The crop should not be allowed to stress, as the second stress of inundation can be costly. In a dry winter the most appropriate second watering would be early to mid flowering. The use of moisture probes is highly recommended.

Irrigators on heavy black earths (such as the Darling Downs and Liverpool Plains) should take extra care with watering, especially paddocks that have dried out and cracked to depth.

Harvesting and early harvest management

Early harvest management is particularly important on cotton farms, in order to minimise risks associated with the emergence of diapausing *H. armigera* in late spring.

There is a current publication covering this issue, and this will be updated this winter. Contact NSW Agriculture, Queensland DPI, Pulse Australia or your agronomist later in the season.

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For further information contact John Slatter on phone: 07 4635 0726 or source the latest chickpea crop management notes from your agronomist or department office. Also see Queensland Winter Crop Management Notes on CD and the NSW Agriculture Chickpea Agfact

Thanks to the following for their comments and technical input: Iain Macpherson, Macpherson Agricultural Consultants Goondiwindi; Paul McIntosh, Agronomist Queensland Farmers Warehouse Toowoomba; and Glen Fresser for providing his 2001 chickpea crop details.