

## ***CHICKPEA CHECKLIST*** ***For Southern Growers***

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<b>Chickpea Quick Check List</b>	
Have rainfall requirements been considered?	Yes
Has available soil moisture been calculated and depth measured?	Yes
Saline, sodic or high boron soils avoided?	Yes
Compacted, dense and water-logging soils avoided?	Yes
Broadleaf and grassy weeds controllable?	Yes
Are you aware that crop topping is not possible in chickpeas?	Yes
No herbicide residues?	Yes
Is Ascochyta blight risk known and manageable?	Yes
Are chickpea stubbles from last year sufficiently far away?	Yes
Is the paddock at low risk for root diseases and/or are they manageable?	Yes
Is variety choice adequate and specific variety management package known?	Yes
Seed quality and seed fungicide dressing adequate?	Yes
Inoculation procedures adequate?	Yes
Seed handling and sowing equipment "soft" on seed during seeding?	Yes
Are you sowing up and back. Have you considered using a 'wider row' spacing?	Yes
Are fertilizer requirements met?	Yes
Adequate crop establishment achievable?	Yes
Will you minimize aphids in neighbouring crops to manage viruses in chickpeas?	Yes
Is crop monitoring at critical stages organised?	Yes
Ability to respond to crop management needs in timely way?	Yes
Boom spray set up for fungicides?	Yes
Desiccation considered as harvest aide?	Yes
Harvest and storage infrastructure for grain at 14% moisture	Yes

## **PADDOCK SELECTION.**

### **1. Have you assessed rainfall requirements and amount of stored soil moisture in your paddocks?**

In southern Australia, chickpeas are virtually reliant on in-season rainfall. They are deemed to require <350mm annual rainfall, but there are opportunities to grow them in lower rainfall areas if adequate soil moisture is present at sowing (e.g. >20mm of stored soil water at 0-60cm depth). The best guide to assessing soil water storage is to put down several soil cores.

Rainfall requirements differ with type grown since late maturing kabuli varieties like Almaz<sup>(1)</sup> require a longer growing season. Spring sowing might be an option in areas with >550mm annual rainfall.

### **2. Are you avoiding country that is either saline, sodic or highly boron toxic?**

Saline soils E<sub>Ce</sub> >1.5 ds/m will cause a yield reduction, sodicity (ESP) >1.0 surface or >5.0 in subsoil can limit yield. High boron and soil chloride levels >600 mg/kg in sub-soil layers will severely limit root growth, depth and water extraction from the soil.

### **3. Are the paddocks prone to water logging problems and poor drainage?**

Avoid dense soils (bulk density >1.5) or compacted soils or areas where free water does not drain away and/or remains saturated. Spring sowing may be an option in higher rainfall areas.

### **4. Are broad-leaved weeds likely to be a significant problem?**

Herbicide options for broad-leaved weed control are very limited. Growers will need to consider alternative control strategies if the standard treatment of post-sow pre-emergent Simazine is unlikely to provide adequate control ie:

- The use of Balance<sup>®</sup>
- Use of trifluralin
- Inter-row cultivation is only an option in wide row systems
- Inter-row shielded sprayer (glyphosate) is only an option in wide row systems
- Post emergent Broadstrike<sup>®</sup> may be damaging (refer to label)
- Directed post-emergence sprays of Broadstrike<sup>®</sup> and/or Simazine

### **5. Are grassy weeds likely to be a significant problem?**

Herbicide options for grassy weed may be very limited if herbicide resistant ryegrass is present. Growers will need to consider alternative control strategies if the standard trifluralin pre-sowing treatment and post-sow pre-emergent Simazine is unlikely to provide adequate control ie:

- The use of Balance<sup>®</sup>
- Use of group A herbicides post-emergent if herbicide resistance not present
- Inter-row cultivation is only an option in wide row systems
- Inter-row shielded sprayer (glyphosate) is only an option in wide row systems
- Crop topping or weed wiping are not options to prevent seed set of escape weeds.

Avoid paddocks with high seed numbers of herbicide resistance unless a programmed strategy is in place.

### **6. Are you aware that crop topping is not an option with chickpeas?**

Crop topping Crop topping or weed wiping are not options to prevent seed set of escape weeds in chickpeas because of their delayed maturity and variable crop height.

Avoid paddocks with high seed numbers of herbicide resistance unless some other programmed strategy is in place, eg wide rows and inter-row spraying with shielded sprayers.

### **7. Are herbicide residues likely to be a problem?**

- Sulfonylurea residues (eg Glean<sup>®</sup>/Logran<sup>®</sup>, Hussar<sup>®</sup>, Atlantis<sup>®</sup>, Monza<sup>®</sup>)
- Imi's (eg Midas<sup>®</sup>, Intervix<sup>®</sup>, Flame<sup>®</sup>, On Duty<sup>®</sup>)
- Grazon<sup>®</sup> DS, Lontrel<sup>®</sup>, or Ally<sup>®</sup>, during any fallow period
- Tordon<sup>®</sup> residues.

Read the label for plant-backs based on rainfall requirements for herbicide residue breakdown, soil PH and rate of product used.

## 8. Is Ascochyta risk known and manageable?

Ascochyta blight in chickpeas is now manageable, but can still loom as the biggest potential issue in southern Australian chickpea production unless it is managed by a combination of variety choice, strategic use of fungicides and crop hygiene (seed source, rotation, proximity of chickpea stubbles). Ascochyta resistant varieties like Genesis™ 090 or Genesis™ 509 are not immune to ascochyta blight, particularly at pod fill, but do make it easier to control with reduced risk, inputs and expense.

Lower rainfall areas must be considered as being at least medium risk for ascochyta, but could be high risk on an individual paddock basis. Know the ascochyta blight disease rating of the variety grown; assess the individual paddock risk and manage the crop appropriately. Be aware of the specific management needs for the variety chosen through its variety management package (VMP).

## 9. Is paddock greater than 1km from last year's chickpea crops?

Paddocks closer than 1km to last years chickpea stubble should be considered as a higher risk from Ascochyta blight infection and need to be managed as such. Varieties with higher Ascochyta resistance such as PBA Slasher<sup>®</sup>, Genesis™ 090 or Genesis™ 509 should be considered, otherwise otherwise there is the need for programmed ascochyta spraying through the season. Where possible place as great a distance as practical between this year and last year's chickpea paddocks and be mindful of common wind direction.

## 10. Are the paddocks at risk from root rots?

Avoid sowing chickpeas into paddocks that have a recent and prolonged history of predominantly legume (e.g. medic, lentil, and field pea) or broadleaf crops (e.g. canola). Phoma, fusarium, pythium or sclerotinia may be present. Seed treatment should be considered mandatory for protection, especially with kabuli types. Phytophthora root rot (PRR) as experienced in northern and central NSW chickpea regions is not considered to be a big issue in southern Australia. Resistance to PRR may perhaps provide slightly better tolerance to waterlogging or common root rots in southern Australia.

# SOWING.

## 11. Is variety chosen suitable?

In variety choice, consider yield and adaptation to the area, disease resistance, grain quality, marketability and proximity to receival point. Be aware of the specific management needs for the variety chosen through its variety management package (VMP).

## 12. Have you organized good quality sowing seed?

- High germination (above 80%)
- High vigour (AA test)
- Large, graded seed
- Low risk from Ascochyta blight infection
- Evenly coated with seed dressing (P-Pickle<sup>®</sup> T, Thiraflo<sup>®</sup>, Thiragranz<sup>®</sup>)

## 13. Are your inoculation procedures adequate?

Only purchase refrigerated (but not frozen) inoculum from a reputable supplier and then store it in a cool, dry place. Treat seed within 24 hours of sowing and sow into moist soil. Consider new technologies that are now also available and may suit your operations, e.g. freeze-dried inoculums, water liquid injection, granular inoculums. Dry sowing of chickpeas is now possible if using granular inoculums that enable rhizobia survival until rain arrives to germinate seed.

## 14. Is it possible to sow up and back. Have you considered using a 'wider' row spacing?

As part of an overall farming system, there is a move towards using row spacing configurations with chickpeas wider than the standard 15 to 25cm. Sowing at 30 to 50cm spacing is becoming common. Some innovators are sowing in 50 to 100cm row spacing and using inter-row spraying for weed control. Wider rows require adequate stubble presence to minimize soil evaporative losses and viruses. Weed control must be considered too. Standing stubble and wider rows improve chickpea harvestability and may have advantages in:

- low yielding or lower rainfall situations, or
- when dense canopies would otherwise reduce pod set and lead to BGM.

Fitting the farming system is the important issue., Disadvantages are normally more than offset by the advantages offered by machinery access and zero or minimum tillage systems with stubble retention.

## 15. Have you assessed the need for phosphate and other fertilizers?

Chickpeas are efficient at extracting soil phosphate and consistent responses are only likely where soil (P) levels are low.

High rates of (P) and Zinc will be required in most long fallow situations (fallows longer than 10 months) where soil VAM levels may be low.

## 16. Can you ensure even crop establishment and development?

Thin and uneven crops are difficult to manage (weeds, insects, desiccation and harvest) and often result in delayed maturity and a blow out in insecticide costs. Aim to sow at a good even depth into good soil moisture. Ensure that the seed handling equipment and seeder is not too aggressive on the seed (eg use shifters instead of augers and avoid high blower speeds in air seeders).

## 17. Will you monitor for and minimize aphid presence in neighbouring susceptible crops to minimise virus incidence in chickpeas? Are you able to do it yourself?

Viruses need to be controlled by an integrated approach to controlling their source, vector (aphid spread) and ensuring crop management to minimise aphid landing sites.

- Control summer weeds to reduce the “green bridge” as a source for aphids and viruses
- Sowing to ensure absence of bare soil and either an early dense crop canopy or stubble is present to minimise aphid landing sites
- Monitoring for aphid flights entering neighbouring susceptible crops (eg lentils, canola) and ensure early aphid control there to minimize their presence in the chickpeas and so reduce virus spread.
- Using “soft” aphicides to protect beneficial insects that provide long-term control of aphids.
- Appreciating the role of integrated pest management.

### ACKNOWLEDGEMENT

Adapted from Northern Region Chickpea publication first produced by Mike Lucy, Qld DPI&F, then Gordon Cumming, Pulse Australia (2007). See also “Chickpea disease management strategies Southern Region, Pulse Australia.

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## IN-CROP MANAGEMENT.

### 18. Do you have access to an experienced Agronomist to monitor at the critical stages? Are you able to do it yourself?

- Aphid inspections and control to minimise physical damage and reduce virus incidence
- Ascochyta blight inspections if growing a susceptible variety (starting 6-8 weeks post-sowing)
- Heliethis management from flowering onwards (Sept – Nov)
- Botrytis inspections during spring
- Timing of desiccant sprays

### 19. Will your response to crop management needs be timely?

Delays in responding to the need to control insects, disease or weeds in a timely way can be very costly. Crop desiccation and harvest needs also to be timely.

### 20. Is your boom spray set-up adequate for fungicide application?

- Nozzle selection to produce BCPC Fine – Medium Droplets.
- Higher pressure (over 350 kPa)
- Higher volume (at least 80 L/ha)

## HARVEST MANAGEMENT

### 21. Have you considered desiccation as an aide to early harvest management?

Seek out information or guidance on the correct stage to desiccate the crop. Crop topping is not an option to prevent weed seed set as it is often too late.

### 22. Do you have the on farm infrastructure to harvest chickpeas at 14% moisture?

See Chickpea – Harvest, Handling and Storage publications. Receival moisture content for Chickpeas is to 14%. Physical damage and loss in grain quality may result from harvesting at low moisture. Storage at greater than 14% grain moisture will require aeration.