

C2. Chickpea Ascochyta Blight Management, Mid North (Turretfield), South Australia

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Aim

To identify optimum ascochyta blight management strategies for maximising grain yield of new varieties.

Treatments

Varieties: Table 1

Sowing date: 31 May

Treatments: Nil – no fungicide applied

Podding – 2L/ha Chlorothalonil at Podding (8 Oct)

Strategic – 2L/ha Chlorothalonil at 8 weeks (6 Aug), Early Flower (20 Sept) and Podding (8 Oct).

Complete - 2L/ha Chlorothalonil fortnightly from 6 Aug.

All treatments were inoculated with ascochyta blight infected chickpea straw on July 15th.

Fertiliser: MAP + Zn @ 100kg/ha

Table 1: Ascochyta blight ratings of kabuli and desi chickpea varieties, Turretfield 2012.

Variety	Grain type	Ascochyta Rating
Genesis090	Kabuli	R
Genesis114	Kabuli	MS-MR
Genesis Kalkee	Kabuli	MS-MR
CICA0857	Kabuli	MR **
PBA Slasher	Desi	R
PBA Striker	Desi	MR
CICA0717	Desi	MS-MR **

** = limited evaluation

Results and Interpretation

- Disease infection - This trial had a high initial level of ascochyta blight infection due to the inoculation with infected chickpea straw, with individual plots showing up to 15% plot infection. Dry seasonal conditions during spring reduced late season disease spread and some level of plant regrowth (recovery) was observed in the most susceptible varieties. Nil and Podding treatments showed the highest ascochyta blight infection, while Strategic and Complete treatments showed the lowest (Table 2). Genesis090 showed lower levels of ascochyta blight infection than all other varieties except CICA0857, PBA Slasher and CICA0717 (Figure 1). Genesis Kalkee showed higher levels of ascochyta blight infection than all other varieties except PBA Striker.
- Grain yield - the average grain yield for the trial was 2.6t/ha. There was no treatment x variety interaction for grain yield or ascochyta blight infection in this trial, meaning that all varieties responded similarly to each of the fungicide strategies. Complete disease control (fortnightly applications of chlorothalonil) yielded 13% higher than the Nil (untreated control), while the Strategic disease management treatment (chlorothalonil at 8 weeks after sowing, early flower and early podding) yielded 7% higher than the Nil (Table 2). The Podding treatment (chlorothalonil only at podding) yielded 4% lower than the Nil. PBA Slasher and PBA Striker were the highest yielding varieties in the trial, followed by CICA0717, Genesis090 and CICA0857 (Figure 1). Genesis114 and Genesis Kalkee were the lowest yielding varieties, averaging approximately 25% lower yielding than PBA Slasher.

Table 2. Effect of ascochyta blight management practice on grain yield (t/ha) and ascochyta blight infection (% plot infected) of chickpea, Turretfield 2012.

Treatment	Nil	Podding	Strategic	Complete	LSD (0.05)
Disease Infection (% plot infected)	4.57 ^s	4.85 ^s	2.95 ^T	2.24 ^T	1.34
Yield (t/ha)	2.48 ^b	2.37 ^a	2.66 ^c	2.79 ^d	0.108

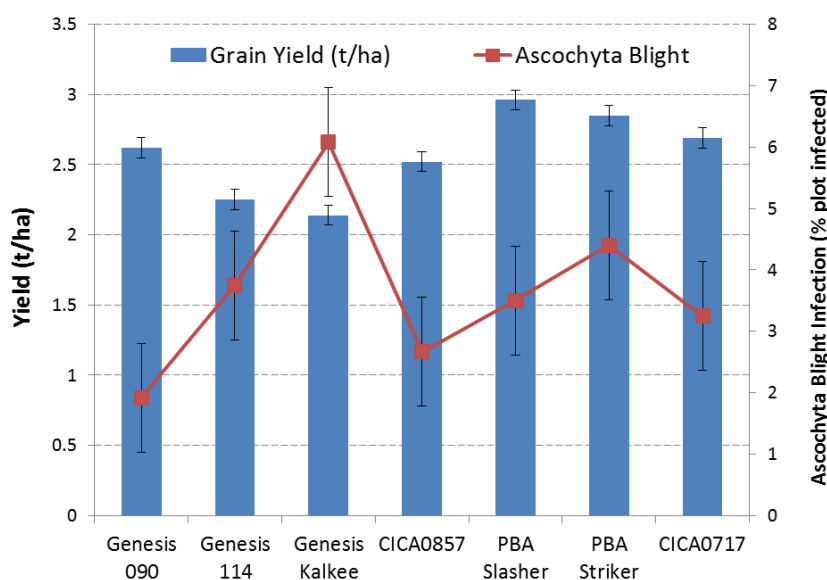


Figure 1. Grain yield (t/ha) and ascochyta blight infection (% plot infected) of chickpea varieties, Turretfield 2012.

Key Findings and Comments

- The mild (although dry) finish to the 2012 season suited chickpeas at this site enabling them to mature slowly and achieve relatively high yields (averaging 2.6t/ha).
- Across all varieties a 13% yield improvement from fortnightly disease control, and a 7% yield improvement from strategic control involving three applications of chlorothalonil compared to untreated plots occurred.
- All current chickpea varieties are susceptible to seed staining from ascochyta blight, and require foliar fungicides at the onset of podding. Varieties rated as MR and MS-MR will also benefit from strategic fungicide applications during the growing season to control disease. Previous research suggests that the optimum timing for strategic fungicide application is 6-8 weeks after sowing (when initial protection from P-Pickel T is wearing off) and at early flowering (to provide protection from flowers).
- A small yield penalty (4%) occurred in the Podding treatment compared with the Nil treatment. This response is unexpected, since application of chlorothalonil at podding merely protects the pod from ascochyta blight infection and consequential staining of seeds, and is not expected to affect grain yield. This result should be treated with caution, and further evaluation is required.
- The recently released varieties PBA Slasher and PBA Striker were the highest yielding varieties in the trial. There was no difference in ascochyta blight infection between these two varieties in this trial, however previous work has shown that PBA Slasher has improved resistance compared to PBA Striker, and is the preferred variety where this disease is common.
- Due largely to their earlier maturity the desi chickpea varieties outyielded the kabuli varieties, except for Genesis090 which yielded similarly to CICA0717. However kabuli varieties can attract premium prices if good seed quality (free from staining and uniform in colour) is achieved.

- Genesis114 and Genesis Kalkee were lower yielding than the other kabuli varieties Genesis090 and CICA0857, however will attract a premium price based on their larger and more consistent seed size.
- The kabuli line CICA0857 showed similar grain yield to Genesis090, and has a larger and more consistent seed size than Genesis090. Its earlier maturity compared to Genesis090 may also provide improved yield stability across variable seasons and in lower rainfall chickpea growing areas.