Chickpea fungicides - Mingenew

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Key Messages

- 2019 had below average growing season rainfall, which led to very little disease development
- No difference in fungicide treatments was observed due to good environmental control of disease

Aim

To demonstrate the effectiveness of newly registered fungicides on ascochyta in chickpeas.

Background

Since the late 1990's disease issues in chickpea mean that growers are cautious about this crop. Now, varieties with much better disease resistance, along with new fungicides, are supporting a re-emerging industry. As such, growers and their consultants are seeking localised information about how to achieve stable yields whilst managing diseases. This trial aimed to exhibit different fungicide products and timings to demonstrate best practice ascochyta mangement for the Mingenew area.

Site summary

Property	Graham Spencer, Mount Scratch Road Yandanooka
Plot size & replication	1.54 m centres x 20 m sown x 4 reps
Soil type	Red loam/clay
Soil pH ($CaCl_2$)	0-10 cm:6.25 10-20 cm: 5.95
EC (dS/m)	0-10 cm: 0.063 10-20 cm: 0.049
Sowing date	7/5/2019
Sowing rate	Neelam, 110 kg/ha, Target 45 p/m^2
Fertiliser	AgFlow Extra 80 kg/ha, treated with 400 mL/ha Impact
Herbicides & insecticides	IBS: 1.2 kg/ha Terbyne Xtreme (875 g terbuthylazine/kg) + 1.5 L/ha Treflan (480 g/L trifluralin). PSPE: 200 mL/ha Lorsban (500 g/L chlorpyrifos), 200 mL/ha Dominex (100 g/L alpha-cypermethrin). Post Em: 10/7/19: 500 mL/ha Select (240 g/L clethodim), 22/7/19: 200 mL/ha Targa (99.5 g/L quizalofop-p-ethyl). 16/8/19: 300 mL/ha Dominex
Fungicide treatments	1.5 L/ha Barrack Betterstick (720 g/L chlorothalonil), 0.875 L/ha Veritas (200 g/L tebuconazole & 120 g/L azoxystrobin)

Table 1. 2019 monthly rainfall (mm) from BOM Yandanooka station (8143).

Month	May	June	July	August	September	October	Annual	GSR
Rainfall (mm)	1.4	136.2	39.4	32	3.4	6.6	231	219

Method

Chickpea variety Neelam was sown in to dry soil. All plots were inoculated with ascochyta-infected stubble on 16 July 2019 to simulate an early infection similar to what may occur when using infected seed or placing a chickpea crop too close to last year's stubble.

Table 2. Treatment list of control options applied in this trial

Treatment List	
1	Barrack early and late
2	Barrack early and Veritas late
3	Veritas early and late
4	Veritas late
5	nil fungicide

Early fungicide treatments were applied on 3 July and late treatments on 21 August. Fungicide applications were up to 48 hours prior to large rainfall events.
The trial was monitored for disease development throughout the season.

Results

This trial was dry sown on 7 May. Post-sowing, the first significant rainfall event was on 7 June and the crop emerged mid-June. June rainfall (136mm) was well above the local average of 82mm, allowing for reasonable crop establishment (average 26 plants/m^2) and early vigour.

81mm was received after crop establishment, with only a single rainfall event over 10mm. These conditions were not conducive to the development of ascochyta blight, and as such very low levels of disease were seen in trial plots. Whilst differences were observed, with the nil fungicide plots showing some lesions on stems and leaves with minor stem breakage, and fungicide treated plots having smaller lesions with no stem breakage, there was no significant difference in the level of disease (Table 3). Unfortunately, growing season rainfall in 2019 was well below average, as such yields for this site were quite low, with a site average of 0.65 t/Ha (Table 4). There was no significant yield difference between the nil fungicide plots or any of the fungicide treatments, as is expected from the lack of disease presence. Currently chickpeas are trading over $700/t, so even at these low yield levels they are a profitable option.

Table 3. Ascochyta rating for each treatment on 6 September. Rating scale from 0: no infection, to 9: most foliage dead or completely dead. A rating of 1 indicates small lesions on leaves or petioles.

Treatment	**Ascochyta rating** (*P = 0.785*)
Barrack early and late	0.25
Barrack early and Veritas late	0.75
Veritas early and late	0.5
Veritas late	0.75
nil fungicide	1

Table 4. Average yield (t/Ha) for each treatment on 28 October.
Comprehensive fungicide treatments offered no yield benefit compared to no fungicide at all.

Treatment	**Yield t/Ha** (*P = 0.591*)
Barrack early and late	0.63
Barrack early and Veritas late	0.67
Veritas early and late	0.63
Veritas late	0.64
nil fungicide	0.66

Summary of results

The late start, very wet June and drier than normal spring in 2019, saw this chickpea crop emerge and grow very well early on with good pod set, but struggle to fill pods during the tail end of the season. These climatic conditions led to good environmental control of ascochyta, and an inability to discriminate between fungicide treatments, with low disease presence and low yields seen across all treatments. Similar work in a year with more disease presence would better showcase control options for management of ascochyta in the Mingenew area.

Of concern for the Australian chickpea industry is the development of an ascochyta strain in south-eastern Australia which has resulted in a downgrading of resistance ratings for most Australian chickpea varieties. In WA, crop monitoring by CCDM has to date not found the southern strain of ascochyta in WA. Therefore, we believe the dominant ascochyta strain in WA to be similar to the northern strain. In our experiment, we selected the variety Neelam, which is rated MR/MS in the northern regions of eastern Australia and MS in the southern region. Most other desi chickpeas that are currently available are rated S to the southern strain. We encourage growers to isolate from previous years' chickpea stubble, sow only clean seed, continue to use a robust fungicide package and to monitor crop closely.

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