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Avoiding Ascochyta blowouts in '09

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The 2008 season saw the highest level of Ascochyta blight in chickpeas since the epidemic of 1998 – the first year Ascochyta was widespread in eastern Australia.

The 2008 chickpea season in northern and north central NSW was characterised by good summer fallow moisture, a reasonable start, a mild June and July with frequent showers (depending on location), a cold relatively dry August with severe frosts and a wet spring. Yield potentials were high.

Not only was the 2008 incidence and severity of Ascochyta well above that seen in the previous nine years, the disease was widespread with almost every crop inspected having some disease. In previous years, serious Ascochyta had been confined to the occasional crop where at least one of the Ascochyta management rules had been broken.

Ascochyta lesions on pods of Jimbour chickpeas, Walgett, October 2008. Seed from this crop was rejected at receival because of Ascochyta lesions on the kernel (seed).

The severity of Ascochyta in 2008 ranged from insignificant with no impact on yield and grain quality – to 100 per cent loss through abandonment.

Fortunately, most crops fell in between and whilst managing disease was a challenge for many growers, those who got on

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TAKE HOME MESSAGE...

- Effective Ascochyta management gives gross margins up to $272 per tonne.
- Ineffective management will cost you dearly.
- 2009 will be a high risk season for Ascochyta.
- **Chlorothalonil permit PER9814, expired January 9, 2009 and is currently being reviewed.** If it is not renewed, Flipper and Yorker are your safest options for 2009; Jimbour will need intensive Ascochyta management using mancozeb products.
- Manage Ascochyta in all varieties as if they were Jimbour – that is, spray before disease is found.
- The first spray is the most important – don't miss it.
- Organise headers to minimise harvest losses and reduce weather damage.
- Don't forget about Phytophthora.

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top of Ascochyta were looking at respectable yields. Crops harvested before the rain varied from 1.5 to 4.2 tonnes per hectare with many around 2.5 tonnes or better.

In some areas, wet conditions during and after grain fill and maturation led to Ascochyta pod infections resulting in lesions on seed and subsequent discounting or rejection at delivery.

Why was there a blowout in 2008?

There were three key reasons for the high level of Ascochyta in 2008 chickpea crops: Early infection; Rain; and, Complacency.

The time when a chickpea crop gets infected with Ascochyta – and thereby the level of disease in the crop – are determined by many factors including:

History of chickpea production in the locality, likelihood of surface water flow, upwind/downwind position of current paddock relative to last season's paddock, presence of volunteers in current and neighbouring paddocks, years since last chickpea crop was grown in the current or neighbouring paddocks, proximity to previous chickpea paddocks (for past three years), variety, seed source, seed treatment, time of planting, number of in-crop rain events, and in-crop management which includes the key activities of monitoring and timely application of foliar fungicides.

The early part of the 2008 season was characterised by small but frequent rainfall events; often these were of little value to the crop but were sufficient to allow Ascochyta to infect and spread. Early sown crops (mid May) were exposed to additional rainfall events and many of these had multiple Ascochyta infections and hot spots by the second week of August.

Complacency a problem

Many growers and agronomists conceded that they did not think Ascochyta would be a problem in 2008, because they had not seen it or it had not been a problem in the past two seasons. This complacency meant that crops were not monitored as closely as they should have been or they did not get their early Ascochyta fungicide spray or the follow up one.

Some crops did not get sprayed even though growers knew Ascochyta was in their crops and was spreading.

What about Flipper?

In the early-mid part of the 2008 season, crops of Flipper chickpeas in the Coonamble, Parkes, Narrabri, Walgett, Warren and Liverpool Plains districts had levels of Ascochyta above that seen in previous seasons (these seasons were not as conducive to Ascochyta as 2008).

Flipper is rated Moderately Resistant in the 2008 Pulse Breeding Australia (PBA) national chickpea variety disease ratings and the Ascochyta package for Flipper states that once the disease starts to spread the crop should be sprayed, monitored and sprayed again if needed. Because of its longer maturity, Flipper tends to be planted early, exposing it to more rain events.

This, combined with weather conditions highly conducive to Ascochyta, inadequate monitoring and delayed application of foliar fungicides are the reasons for the high incidence of Ascochyta in some 2008 Flipper crops.

There is no evidence that Flipper's moderate resistance to Ascochyta has broken down.

The best demonstration of this was in a paddock of Jimbour near Mullaley that had two strips of Flipper separated by a strip of Jimbour. The entire paddock was managed as one. On October 28, 2008, numerous patches of Ascochyta were obvious in the Jimbour areas but were absent in the Flipper strips.

2009 MANAGEMENT

The high incidence of Ascochyta in 2008 means most paddocks intended for chickpeas in 2009 will already be contaminated with Ascochyta inoculum. Planting chickpeas into these paddocks carries a high risk of Ascochyta if the 2009 season favours the disease. It is important that chickpea growers follow the Ascochyta management plan and make sure they apply their first fungicide on time.

All varieties should be managed the same way for their first spray – that is, before the first rain event after crop emergence, or three weeks after emergence or at the three branch stage of development (whichever occurs first).

If there is a split emergence, growers will get the best results if they spray twice.

For management of Flipper after the first spray, consult the revised Variety Management Package (VMP) for Flipper available from the Pulse Australia website.

Are there varieties with better Ascochyta resistance?

Yes. A new desi variety bred at Tamworth and currently designated CICA512, has considerably better resistance to Ascochyta than Flipper. CICA512 is one the first chickpea varieties to be bred in PBA – a new joint venture between state DPIs, GRDC and The University of Adelaide. On October 1, 2008, Parkes agronomist Peter Yelland showed us a crop of CICA512 that had not been sprayed with a fungicide – Ascochyta could not be found in this block.

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NSWDPI chickpea breeder Ted Knights and plant pathologist Kevin Moore, inspect one of the Tamworth 2008 chickpea Ascochyta trial plots. This plot of the new chickpea variety CICA0512 didn't receive any fungicide sprays. CICA0512's resistance to Ascochyta is almost as effective as five applications of a fungicide.

This plot of 'Gully' – an old variety highly susceptible to Ascochyta blight – has been wiped out without the protection of a fungicide.

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But the disease was readily found in an adjoining block of Jimbour that had already had two mancozeb sprays.

CICA512 will also provide improved Phytophthora resistance (rated Moderately Resistant – slightly better than Jimbour) and higher yield potential (equivalent to Jimbour).

How do I manage Ascochyta in a particular variety?

The Tamworth Ascochyta management trial (TAC08) sought to match Ascochyta management to a variety's susceptibility to the disease. The trial was sown late (June 27) because of lack of planting moisture, inoculated with Ascochyta on August 30 just prior to rain, received 430 mm of rain between inoculation and harvest and was exposed to 25 infection periods (leaf wetness for at least three hours).

Seasonal conditions favoured disease and by the second week in October, unprotected susceptible varieties were dead.

The trial had two control treatments, one to maximise disease (no fungicide sprays) and one to minimise disease (a pre-inoculation spray then regular sprays with 1.0 litre per hectare fungicide containing 720 grams per litre chlorothalonil).

TABLE 1: Fungicide program for five desi and one kabuli variety, Tamworth (TAC08)

	Fungicide spray & date	1st	2nd	3rd	4th	5th	6th
TAC 08	Treatment	29 Aug	12 Sep	3 Oct	13 Oct	1 Nov	15 Nov
Chlorothalonil	1L/ha chloro	Y	Y	Y	Y	Y	Y
Mancozeb	1kg/ha manco	Y	Y	Y	Y	Y	Y
Jimbour	VMP 0.5L/ha chloro	Y	Y	Y	Y	Y	Y
Kyabra	VMP 0.5L/ha chloro	Y	Y	Y	Y	Y	Y
Yorker	VMP 1kg + 0.5L chloro	Y	Y	Y	Y	Y	Y
Flipper	VMP 0.5L/ha chloro	N	N	Y	Y	Y	Y
CICA512	VMP 0.5L/ha chloro	N	N	Y	Y	Y	Y
Genesis425	VMP 0.5L/ha chloro	N	N	Y	Y	Y	Y

TABLE 2: Number and cost of fungicide sprays, grain yield and gross margins for five desi and one kabuli variety, Tamworth (TAC08)

TAC 08 Treatment	Sprays	Cost $/ha	Yield kg/ha	GM $/ha
Jimbour 1L chlorothalonil	6	126	2825	704
Jimbour 1kg mancozeb	6	72	1866	374
Jimbour 0.5L VMP	6	78	2504	624
Jimbour Nil	0	0	19	-292
Kyabra 1L chlorothalonil	6	126	2715	660
Kyabra 1kg mancozeb	6	72	1860	372
Kyabra 0.5L VMP	6	78	2533	635
Kyabra Nil	0	0	0	-300
Yorker 1L chlorothalonil	6	126	2684	648
Yorker 1kg mancozeb	6	72	2672	697
Yorker 1kg + 5x 0.5L VMP	6	77	2782	736
Yorker Nil	0	0	1630	352
Flipper 1L chlorothalonil	6	126	2512	579
Flipper 1kg mancozeb	6	72	2510	632
Flipper 0.5L VMP	4	52	2221	537
Flipper Nil	0	0	1980	492
CICA512 1L chlorothalonil	6	126	2482	567
CICA512 1kg mancozeb	6	72	2447	607
CICA512 0.5L VMP	4	52	2747	747
CICA512 Nil	0	0	2310	624
Genesis425 1L chlorothalonil	6	126	2500	574
Genesis425 1kg mancozeb	6	72	2652	689
Genesis425 0.5L VMP	4	52	2529	660
Genesis425 Nil	0	0	2140	556

(Gross margins are based on the cost of fungicide and application plus other variable costs of $300/ha)

We evaluated VMPs for five desi varieties – Jimbour, Kyabra, Yorker, Flipper, CICA512 and the small seed kabuli Genesis425.

As well as the two control treatments, a third treatment was applied to all varieties – one kg per hectare product containing 750 grams per kg mancozeb.

Jimbour, Kyabra and Yorker had their first spray before inoculation. The VMP for Jimbour and Kyabra was 500 ml per hectare fungicide containing 720 grams per litre chlorothalonil, Yorker's VMP was an initial one kg per hectare mancozeb product then 500 ml per hectare chlorothalonil product.

Flipper, CICA512 and Genesis425 did not get their first spray until 93 mm and four infection events (five weeks) after inoculation by which time Ascochyta had established in the lower half of the canopy.

Table 1 lists details of the TAC08 trial.

The trial demonstrated the relative susceptibility/resistance to Ascochyta of the varieties and showed that as susceptibility increases, spraying for Ascochyta becomes critical. Indeed, not protecting Jimbour and Kyabra resulted in virtually 100 per cent yield loss.

Conversely, as resistance increases the need to spray for Ascochyta becomes a less important part of management.

For example a farmer should be able to grow CICA512 with no in-crop fungicides and get the same yield as if he had sprayed six times with one litre per hectare chlorothalonil. This represents a saving of $126 per hectare. And then there is the convenience of not having to organise spray contractors or the anxiety if the contractor does not turn up on time or if the rain arrives earlier than predicted.

TAC08 also showed that one kg per hectare mancozeb is quite cost effective on varieties where resistance to Ascochyta is as good, or better than, Yorker. But one kg per hectare mancozeb was less effective than 500 ml per hectare chlorothalonil on very susceptible varieties (Jimbour, Kyabra).

Whilst one litre per hectare chlorothalonil gave the least disease and the cleanest plots, it gave the highest gross margins only on the most susceptible varieties.

The most profitable Ascochyta strategy on the other varieties was either the VMP – that is, 500 ml per hectare chlorothalonil or one kg per hectare mancozeb (Table 2).

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