CHICKPEAS – WHAT WE LEARNT IN 2011 AND RECOMMENDATIONS FOR 2012

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Take home message:

Plant seed of high quality that has been properly treated with a registered seed dressing.

Follow the disease management recommendations in this article and associated links – they will maximise your chance of a profitable chickpea crop in 2012.

Even though Ascochyta and BGM did not cause widespread losses in 2011, the pathogens are endemic in the region and complacency is the greatest risk to 2012 crops.

2011 Tamworth Ascochyta trials confirmed PBA HatTrick's® Ascochyta rating and demonstrated that PBA Boundary® and other new lines have even better resistance to that disease.

WHAT HAPPENED IN 2011?

The 2011 winter season in the GRDC Northern region was a mixed bag depending on where you were. Overall, southern areas (north central NSW) were drier than the northern ones (northern NSW/southern QLD) with drought conditions in June and July. August had above average rain throughout the region; September had almost double the average rain and October was average in the south but well above in the north. November was well above average across the region but this was the result of a wet week late in the month. So how wet was it?

At Dubbo, from June to November, 318 mm of rain fell on 52 days with 34 days >1.0mm, compared with a long-term average of 282 mm on 43 days (34 days >1.0mm). Corresponding figures for the 2010 season are 407 mm, 68 days and 39 days.

For the same period at Moree, 473 mm of rain fell on 43 days with 25 days >1.0mm, compared with a long-term average of 283 mm on 50 days (31 days >1.0mm). Corresponding figures for 2010 are 389 mm, 51 days and 35 days.

The season was much cooler than average with frosts and low temperatures common well into spring. Indeed, the average daily temperature did not stay above 15C until the 1st and 2nd week in October at Moree and Dubbo respectively. These cooler conditions led to flower and pod abortion from August to mid October. *Botrytis cinerea* colonised this aborted tissue - many believed this was the first sign of Botrytis Grey Mould (BGM) and wanted to spray. It was a challenge convincing them to save their two carbendazim sprays for when they had something to protect. BGM did threaten crops once temperatures got above 15C but was managed well with fungicides.

The wet conditions favoured foliar diseases especially in the north. Ascochyta was common early but generally was managed extremely well. PBA HatTrick's® moderate resistance to Ascochyta was again demonstrated but its pods were infected where critical fungicide sprays were missed.

Waterlogging and Phytophthora were problems in high risk paddocks but overall losses were small.

Virus diseases were rare except in crops with low plant populations and patchy stands.

By far the most striking problem in 2011 across the region was Botrytis seedling disease.

Botrytis seedling disease

The fungus that causes BGM (*Botrytis cinerea*) also causes pre- and post-emergence seedling death.

In 2011, Botrytis seedling disease was common in most northern region crops sown with grower retained seed. The disease came from seed infected during the 2010 BGM epidemic. In every case, this seedling disease in 2011 crops could be traced to inadequate treatment of the 2010 crop seed, due to poor coverage or insufficient rate or both.

Together with poor germination and vigour, the result was a patchy crop with a low population and secondary infection of healthy seedlings by Botrytis via root contact. Botrytis basal collar rot appeared from September onwards. Patchy stands made weed management challenging and led to a higher risk of viruses.

2011 field trials at Moree, Bellata, Breeza (in collaboration with NGA) and Tamworth, using seed from 2010 crops affected by BGM, showed that Botrytis seedling disease is readily controlled with registered seed treatments, as long as they are applied correctly. However, we do not recommend using Botrytis infected grain as planting material even if treated. The seed will have lower vigour and this will increase the risk of other seedling diseases. Also, sowing rates will need to be increased to account for the reduced vigour, which may make using grower retained seed uneconomical.

DISEASE MANAGEMENT RECOMMENDATIONS FOR 2012 – GRDC NORTHERN REGION

Seedling disease

Seed borne Botrytis, seed borne Ascochyta and several soil borne fungi can cause pre- and post-emergence seedling death. Irrespective of source of seed and year of production all chickpea planting seed should be treated with a registered seed dressing (Table 1). Proper coverage and rate are essential.

Table 1 Chickpea Seed Treatments

Active ingredient	Example Product	Rate	Target disease
thiabendazole 200 g/L+ thiram 360 g/L	P-Pickel T®	200 mL/100 kg seed	Seed-borne Ascochyta and Botrytis, Damping off, Fusarium
thiram 600 g/L	Thiram 600	200 mL/100 kg seed	Damping off, seed-borne Botrytis and Ascochyta.
thiram 800 g/kg	Thiragranz®	125 g/100 kg seed	Seed-borne Botrytis and Ascochyta, Damping off
metalaxyl 350 g/kg	Apron® XL 350 ES	75 mL/100 kg seed	Phytophthora root rot

Ascochyta Blight

The following strategy should reduce losses from Ascochyta in 2012:

- Spray all varieties with less Ascochyta resistance than PBA HatTrick with a registered Ascochyta fungicide prior to the first rain event after crop emergence, three weeks after emergence, or at the 3 branch stage of crop development, whichever occurs first.

- For paddocks that had chickpeas in 2010 (yes 2010), spray all varieties including PBA Boundary(b) and PBA HatTrick, prior to the first rain event after crop emergence, three weeks after emergence, or at the 3 branch stage of crop development, whichever occurs first.

- In paddocks that have not had chickpeas for at least 2 years, PBA Boundary, PBA HatTrick and most Genesis lines should not require their first Ascochyta spray until the disease is detected. Monitor these crops 2-3weeks after each rain event from emergence onwards and spray if Ascochyta is detected in the crop or is found in the district on any variety.

- For all varieties with less Ascochyta resistance than PBA HatTrick and for varieties with Ascochyta resistance as good as or better than PBA HatTrick but where Ascochyta has been detected, apply a second spray before the second post-emergence rain event. In 2011, crops that were sprayed on this schedule had the least Ascochyta and subsequent management was successful.

- Ground application of fungicides is preferred. Select a nozzle such as a DG TwinJet or Turbo TwinJet that will produce no smaller than medium droplets (ASAE) and deliver the equivalent of 80–100 litres water/hectare at the desired speed.

- Where aerial application is the only option (e.g. wet weather delays) ensure the aircraft is set up properly and that contractors have had their spray patterns tested.

Botrytis Grey Mould, BGM

Foliar fungicides – in areas outside Central Queensland, spraying for BGM is not needed in most years. However, in seasons and situations favourable to the disease, a preventative spray of a registered fungicide before canopy closure, followed by another application 2 weeks later will assist in minimising BGM development in most years. If BGM is detected in a district or in an individual crop particularly during flowering or pod fill, a fungicide spray should be applied before the next rain event. None of the fungicides currently registered or under permit for the management of BGM on chickpea have eradicant activity, so their application will not eradicate established infections. Consequently, timely and thorough applications are critical.

Phytophthora root rot

Phytophthora root rot is a soil and water-borne disease that can become established permanently in some paddocks. Damage is greatest in seasons with above average rainfall but only a single saturating rain event is needed for infection. Avoid high-risk paddocks such as those with a history of Phytophthora in chickpea, water logging or pasture legumes, particularly medics and lucerne. If considerations other than Phytophthora warrant sowing in a high-risk paddock, choose PBA HatTrick or Yorker and treat seed with metalaxyl. Metalaxyl can be applied in the same operation as other seed dressings providing all conditions of permits and labels are met. Metalaxyl only provides protection for about 8 weeks; crops can still become infected and die later in the season.

Further information on chickpea disease management can be found at the Pulse Australia website www.pulseaus.com.au and in the NSW DPI 2012 Winter Crop Variety Sowing Guide eg:

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/272945/winter-crop-variety-sowing-guide-2011.pdf

http://www.pulseaus.com.au/pdf/Chickpea%20Ascochyta%20Blight%20Management.pdf

http://www.pulseaus.com.au/pdf/2011%20Chickpea%20Disease%20Management%20Considerations.pdf

http://www.pulseaus.com.au/pdf/Chickpea%20Botrytis%20Grey%20Mould%20Management.pdf

http://www.pulseaus.com.au/pdf/Chickpea%20Integrated%20Disease%20Management.pdf

http://www.pulseaus.com.au/pdf/Chickpea%20Phytophthor%20Root%20Rot%20Management.pdf

http://www.pulseaus.com.au/pdf/Virus%20Contol%20in%20Chickpea.pdf

http://www.pulseaus.com.au/pdf/Pulse%20Seed%20treatments%20&%20Foliar%20Fungicides.pdf

2011 TAMWORTH ASCOCHYTA MANAGEMENT TRIAL, VMP10

VMP11 sought to match Ascochyta management to a variety's Ascochyta rating. The trial was sown into standing cereal stubble on 8 June 2011 using disc openers on 40cm row spacing in plots 4m wide by 10m long. Each plot was separated from its neighbour on all sides by a 2m x 10m buffer of Genesis425® (rated R to Ascochyta). There were four replicates. On 7 Aug, when plants were at the 5-6 leaf stage, the trial was inoculated during a rainfall event with a cocktail of nine isolates of Ascochyta collected from commercial chickpea crops in 2009 and 2010 at a rate of 500,000 spores per mL in 100L/ha water. From inoculation to desiccation (29 Nov), the trial received 346 mm rain in 33 rain days (26 days >1.0mm) compared with the 100 year average for the same period of 313 mm and 44 rain days (34 days >1.0mm).

There were four varieties: Jimbour, PBA HatTrick®, PBA Boundary® and a desi line scheduled for release, CIAC0912. There were three fungicide treatments: a low disease scenario with regular applications of 1.0L/ha chlorothalonil (720g/L active), a high disease scenario with Nil sprays and a VMP treatment with low and off label rates of chlorothalonil. Data for label rate and nil fungicide treatments only, are reported here. The first VMP spray for Jimbour was applied before inoculation. The first VMP spray for the other entries was applied on 27 Sep after two infection events, when the Jimbour was getting its 3rd spray. Conditions were reasonably favourable for Ascochyta and the unprotected (Nil) Jimbour plots were dead by mid October. The results are summarised in Table 2.

Key findings of VMP11 were:

- Under high disease pressure, Ascochyta can be successfully managed on susceptible varieties with registered rates of chlorothalonil
- Well managed Jimbour yielded 2.7t/ha with a GM of $792/ha
- Under high disease pressure, unsprayed HatTrick still gave a profitable yield (GM $478/ha)
- The new variety, PBA Boundary, performed exceptionally well, yielding over 2t/ha without any foliar fungicide
- The next desi line to be released, CICA0912, performed even better with no significant difference in yield between six sprays of chlorothalonil fungicide (2540 kg/ha) and no sprays (2416 kg/ha)

Table 2. Number and rate/ha of chlorothalonil sprays, cost of spraying, grain yield, and gross margin for four desi chickpea varieties in the Tamworth VMP11 trial. (GMs also take into account other production costs estimated at $300/ha; chickpea price $450/t)

Variety and treatment	No. Sprays	Cost $/ha	Yield kg/ha	GM $/ha
Jimbour 1.0L	6	126	2707	792
PBA HatTrick 1.0L	6	126	2767	819

PBA Boundary1.0L	6	126	2691	785
CICA912 1.0L	6	126	2540	717
Jimbour Nil	0	0	0	–300
PBA HatTrick Nil	0	0	1728	478
PBA Boundary Nil	0	0	2114	651
CICA912 Nil	0	0	2416	787

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