NSW GOVERNMENT | Department of Primary Industries

Managing ascochyta blight in chickpeas in 2021

Key points

- The ascochyta fungus persists on chickpea seed, stubble and volunteers – chickpea is the only host.
- Test all seed for fungal pathogen levels, germination and vigour.
- Treat all planting seed with a registered fungicide, whether you have seen the disease in your district or not.
- If you can see intact chickpea stubble, assume that ascochyta is viable.
- Eliminate volunteer chickpea plants over summer/autumn. Controlling the 'green bridge' is important.
- Avoid planting chickpeas in the same paddock for at least three years or next to last year's chickpea crop.
- Understand your disease risk for each paddock – is it high or low?
- High risk of ascochyta – apply foliar fungicide ahead of the first post emergent rain event.
- Low risk of ascochyta – it is unlikely there will be a cost-benefit of applying a foliar fungicide to 2021 crops until after the disease is detected.
- The new ascochyta fungicides with some salvage activity, do not have better preventative activity than older chemistry.
- Do not rely on salvage fungicide sprays as part of your 2021 ascochyta management plan – aim to apply preventative sprays to crops before rainfall events.
- Monitor the crop 10 to 14 days after each rainfall event.
- In 2021 the chickpea area will be much larger than 2020. Secure your fungicides early.
- CBA Captain(ϕ) released in 2020 has an ascochyta rating of MS, the same as PBA HatTrick(ϕ).

The disease

The ascochyta pathogen survives and spreads in infected chickpea seed, stubble and on volunteers. Under ideal conditions, it can reproduce as fast as five to seven days on very susceptible varieties e.g., Kyabra(Φ). The disease can develop over a wide range of temperatures (5–30 °C) and needs 3–10 hours of leaf wetness to infect, so small showers can be just as effective in disease spread as larger rainfall events. The disease develops quickest when temperatures are 15–25°C and humidity is high. **The longer the leaf wetness and higher the humidity, the more widespread and severe the infection**.

It is not a soil borne pathogen and does not survive long buried or in contact with the soil. The wetter and warmer the soil the shorter the survival, less than one month in a wet summer.

What happened in 2020?

- 138 chickpea crops (92 NSW, 46 QLD) were inspected.
- Ascochyta blight was detected in 13 crops. In some, including one PBA Seamer(Φ) crop near Forbes, it was severe, killing plants in patches up to 1.5 m in diameter. However, in all cases, the disease was managed successfully.
- Ascochyta was not found in any new areas, not surprising given the pathogen is endemic throughout eastern Australian.
- No new pathotypes were found – but the isolate found at Forbes on PBA Seamer(Φ) appears to be more aggressive on PBA Seamer(Φ) than isolates on this variety from previous years.
- Late season rainfall favoured pod infection by *Botrytis cinerea* that affected some seed and led to a quality downgrade for some grain on delivery. A small number of paddocks also had botrytis grey mould (BGM) affecting foliage at the flowering–pod-fill stage.
- Other diseases were uncommon.
- Virus incidence in chickpeas was low, compared to that in faba bean in the northern part of the state. Even those planted next to virus infected faba beans crops had low levels of virus, reflecting the lower attractiveness of chickpeas to the aphid vectors.

Ascochyta leaf lesions: *found in 13 of 138 chickpea crops inspected in 2020.*

Ascochyta pod infection: *found in 2020 crops.*

Life and death: *the difference between varieties in an experiment at Trangie, NSW in 2020.*

Before you sow

Paddock selection

- Avoid planting chickpeas in the same paddock for at least three years.
- Avoid planting chickpeas immediately next to last year's chickpea crop.
- Ensure volunteer chickpea plants are controlled.
- Know your paddock's risk rating.

Variety selection

Chickpea variety ratings for common chickpea diseases in Australia can be found on the GRDC National Variety Trials™ disease ratings website: https://nvt.grdc.com.au/nvt-disease-ratings?crop=17&state=NSW

Seed source

- Be sure you know which variety your seed is. Match the resistance rating of your seed to your district and winter rainfall.
- A recent survey of chickpea seed revealed that nearly one third of seed sampled was not the variety the grower thought it was.

Seed test

Test your seed for both germination and vigour. Pulse Australia minimum standard for germination is 70%.

Free seed testing for germination and pathology is available from NSW DPI.

Send samples to: Chickpea Seed Testing,
Tamworth Agricultural Institute
4 Marsden Park Rd, Calala NSW 2340

Fungicide seed treatment

All planting seed should be treated with a registered fungicide seed treatment, **irrespective of seed age and origin**, to control seed-borne ascochyta (internal and external), seed-borne botrytis seedling disease (BSD) and protect seedlings from soil organisms that can reduce establishment and early vigour under less favourable conditions e.g., cold or wet soils, deep planting.

Research has shown that seed treatment products containing only thiram (e.g., Thiram® 600) are equally effective against Ascochyta as P-Pickel T® (thiram plus thiabendazole). Follow label directions and ensure good coverage of seed.

Seed fungicide treatment: *Effective application of P Pickel T® (left) compared with poor application (right).*

Paddock risk assessment

High risk

Paddock

- Viable inoculum is known to be present. If you can see intact chickpea stubble assume that ascochyta is viable.
- Chickpeas have been grown in the last three years.

Seed

- Seed of unknown pathogen status.
- Seed not properly treated with fungicide.
- Seed has a known low–moderate level of ascochyta infection.

Management

- Grow variety with the highest level of ascochyta resistance suitable for your area.
- Treat all planting seed with a registered fungicide, applied properly to ensure good coverage.
- Apply an ascochyta fungicide before the first post-emergent rain event.
- Monitor the crop 10–14 days after rain.

Low risk

Paddock

- No infected chickpea residue has entered the paddock: via header (which has previously harvested chickpeas), wind or surface water flow.
- Chickpeas not grown for three years.
- Chickpeas not grown in adjacent paddocks in 2020.

Seed

- Seed tested for pathogens with nil detected.
- Seed properly treated with fungicide dressing.

Management

- Treat all planting seed with a registered fungicide, applied properly to ensure good coverage.
- Regularly monitor crop throughout the season, especially 10–14 days after rain
- Apply foliar fungicide if ascochyta detected

Scenario

Low risk chickpea paddock in a high rainfall area.

"I want to grow chickpeas for the first time at Cowra, which has an in-crop rainfall (May–October) of 250 mm and 63 wet days on average. I know there is Asco in the district. What should I do?"

Monitor the crop 10–20 days after the rain starts and if ascochyta is detected, apply a registered fungicide before the next rain event.

Low risk chickpea paddock in a low rainfall area.

"I want to grow chickpeas for the first time at Lake Cargelligo, which has an in-crop rainfall (May–October) of 210 mm and 37 wet days on average. I know there is Asco in the district, what should I do?"

Monitor the crop 10–20 days after rainfall and if ascochyta is detected, apply a registered fungicide before the next rain event. This is the same recommendation as in the previous scenario but is insurance against a wetter than average season and the presence of more aggressive isolates, especially for varieties with lower levels of resistance.

In crop

Begin monitoring as soon as the crop is out of the ground. If ascochyta is detected, apply a registered fungicide as close to the next rainfall event as practical.

Prevention is important during the reproductive stage as the disease on pods causes seed abortion, seed infection and seed defects, and may not be suitable as planting seed for the following season or can be downgraded at delivery.

In-crop fungicides fall into two use patterns, preventive or curative.

Preventative fungicides (active ingredients such as chlorothalonil and mancozeb):

- Preferred products in-crop, being the most reliable and cost effective. They provide excellent protection when applied before rain with good coverage and high-water volumes.
- Chlorothalonil and mancozeb are persistent and rain fast (up to 50 mm rain in 10 minutes).
- Expect several weeks control on plant tissue sprayed with chlorothalonil and mancozeb, but no control on new growth as they have no systemic movement through the plant.
- Refer to fungicide labels for maximum amount of chlorothalonil that can be applied per season.
- Veritas® and Aviator® Xpro® have excellent preventative activity, equivalent to chlorothalonil and are more expensive.

Newly released fungicides (products include Aviator® Xpro® (prothioconazole + bixafen), Azoxystrobin Xtra (azoxystrobin + cyproconazole) and Veritas® (tebuconazole + azoxystrobin).

Points to note:

- These chemicals offer protection via different chemical groups, which is important in an integrated disease management program to prevent resistance.
- Aviator® Xpro® has curative activity as well as residual control.
- Post-infection or salvage applications should not be considered part of a standard management program – only use if a preventative spray is missed.
- These fungicides are more expensive than chlorothalonil with equivalent efficacy as preventive fungicides.
- Veritas®, Azoxystrobin Xtra and Aviator® Xpro® labels state a maximum of two applications of each in any one season.
- Aviator® Xpro® cannot be applied after late flowering. Veritas® can be applied at any growth stage, but has a harvest withholding period (WHP) of four weeks, while Azoxystrobin Xtra has a harvest WHP of seven weeks.
- Expect several weeks control on sprayed plant tissue, but new growth will not be protected as they have little systemic activity.
- Veritas® has activity on BGM (refer to label).

What to do if disease found in the paddock

With all varieties, regardless of resistance rating, crops infected with ascochyta will recover well if dry conditions persist.

If disease is detected and you spray with a curative product, move back to a preventative fungicide regime before the next rainfall event.

Well managed: *Kabuli chickpeas at Canowindra in 2020.*

Changes in the pathogen

The ascochyta fungus is evolving, with more aggressive isolates contributing to an increased susceptibility of all cultivars. This change in aggressiveness has occurred in Victoria, South Australia, New South Wales and Queensland. Slowing the rate of pathogen evolution can be achieved through crop rotation and fungicide use within an integrated management system.

No chickpea variety is immune to ascochyta infection. The varieties with lower disease ratings simply have improved levels of resistance, meaning the disease takes longer to go through a cycle and/or the variety sustains less damage. Changes in the pathogen will continue to occur and cause damage on varieties, even with improved resistance. There is no evidence that these more aggressive isolates are any harder to manage than the older ones and the current management strategy will be just as effective on these "new" isolates as on the "older" ones.

Other diseases

- **Phytophthora root rot** (soil borne) and **Sclerotinia** (seed, soil and air borne). Both can survive in soil for many years (longer during droughts) and still pose a threat to 2021 chickpea crops if conditions are favourable
- **Botrytis seedling disease** (BSD, seed borne). A potentially serious issue in 2021 with 74% of seed tested to date being infected with the Botrytis fungus. Fortunately, proper seed treatment provides 100% control of BSD.
- **Botrytis grey mould** (BGM, air borne). The BGM fungus is ubiquitous, has a very wide host range and is a good saprophyte. If conditions favour BGM i.e., dense canopies, warm humid weather, it will occur.
- **Root lesion nematodes** (RLN), *Pratylenchus thornei*. Research has shown it takes a double break of 40 months free of host plants to reduce numbers to a minimum threshold (2/g soil). Even starting numbers of 10/g soil still need a break of 30 months.
- **Viruses** need a green bridge of chickpeas or other plants for survival or as hosts for virus vectors. Some viruses can be seed borne.

Further information

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