

## Risk Management of Chickpea Disease

At the recent GRDC Grains Research Update held in Goondiwindi Dr Kevin Moore presented on 'Minimising risk of disease in 2017 chickpea crops'. Given the high incidence of disease in 2016 this is especially important.

The 2016 season saw significant incidences of a range of diseases including (Ascochyta, Phytophthora and Botrytis) and as a result large amounts of inoculum will be available to infect 2017 chickpea crops.

There are a range of strategies which growers can employ to reduce the risk of disease. The more strategies adopted the greater the benefit is likely to be.

### Ascochyta blight (AB) (fungus *Phoma rabiei* previously called *Ascochyta rabiei*)

The Ascochyta inoculum could be present in crop residue, seed or on volunteer plants infected over summer and autumn. Infected chickpea residue would exist in paddocks planted to chickpeas in 2016, but may also have been spread by floods and surface water. The seed may be internally infected by the fungus (a consequence of pod infection) or contaminated externally with infected chickpea residue during harvest and handling.

Growers looking to reduce the occurrence and impact of Ascochyta Blight on their chickpeas for 2017 should employ as many of the following strategies as possible.

- Grow varieties with improved AB resistance as these varieties will have less disease and require fewer fungicide sprays.
- Burn cereal stubble as this can hold the AB inoculum. Infected chickpea residue discharged during the 2016 harvest could have blown onto paddocks that are intended for chickpeas in 2017.
- Remove volunteer chickpea plants, simply using herbicide does not eliminate material infected with Ascochyta. Controlling volunteers early will restrict their size and limit the amount of inoculum they can produce.
- Treat all planting seed with a registered fungicide to control both internally borne Ascochyta and external contamination. Testing all planting seed for disease may also be beneficial.
- Sow later in planting window to reduce the number of infection events.
- Utilise wider rows (66cm or more) to improve airflow through the crop and enable more rapid drying after rainfall. This can delay canopy closure and improve penetration of fungicides later in the season.
- Observations in 2016 suggested that there was less Ascochyta in crops which had been sown with tynes. This is thought to be related to burial and movement of Ascochyta inoculum away from the emerging seedlings.
- Stress and high biomass favour Ascochyta. 2016 chickpea crops double cropped into sorghum or cotton residue were less affected by waterlogging and did not produce the biomass of chickpeas sown into winter cereal or long fallow paddocks.
- Apply fungicide before 1st post emergent rain event. Even though PBA Seamer is rated resistant to Ascochyta, growers are urged to apply a preventative fungicide because:
  - the large amount of inoculum will increase disease pressure,
  - it safeguards against changes in the Ascochyta pathogen that are more aggressive or virulent on PBA Seamer and
  - it insures against contamination of PBA Seamer crops with plants of varieties with lower or no Ascochyta resistance (varietal purity is an issue with chickpeas).

Reference: <https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2017/02/Minimising-risk-of-disease-in-2017-chickpea-crops>

### **Phytophthora root rot (PRR)** (fungus-like Oomycete *Phytophthora medicaginis*)

Phytophthora inoculum will be present in chickpea plants that had PRR in previous seasons (up to 10 years), in other host species such as Lucerne, or in soil and water containing PRR infected material and survival structures (oospores, chlamydospores).

To reduce the risk of Phytophthora root rot in chickpea crops growers should aim to;

- Avoid PRR high risk paddocks with a history of medics or where PRR has occurred in previous chickpea or Lucerne crops; the oospores of *Phytophthora medicaginis* can survive for more than 10 years.
- Avoid paddocks with areas prone to waterlogging or paddocks exposed to water flow from chickpea areas as PRR infected material can be spread through water movement.
- Use Metalaxyl-based seed dressings for 6-8 weeks protection after sowing.
- Grow a variety with the highest level of resistance, particularly in situations where medics, chickpea or Lucerne crops have been grown in the past 5-6 years.

### **Botrytis seedling disease (BSD)** (fungus *Botrytis cinerea*)

BSD is a seed-borne disease that can occur at any temperature and under any conditions. BSD can ONLY occur if pods of chickpea crops from which the seed came were affected by BGM. BSD is readily controlled with the standard chickpea seed treatments.

BSD inoculum can be found in seed from pods infected with *B. cinerea* during a prior BGM outbreak. Alternatively, primary infections of BSD from infected seed can lead to secondary infection of initially healthy seedlings through root contact.

The risk of BSD outbreaks can be reduced by avoiding using infected seeds and by treating all planting seed with a registered seed dressing.

### **Botrytis grey mould, BGM** (fungus *Botrytis cinerea*)

BGM is an air-borne foliar disease active only when temperatures warm up towards spring (ca 15°C). It is more prevalent in the warmer regions of the north, where significant crop losses can occur in wet winters and springs as occurred in 2016.

BGM is controlled with foliar fungicides; seed treatment is ineffective. *Botrytis cinerea* is ubiquitous, has a wide host range (over 138 genera in 70 families) and is a good saprophyte, meaning it can survive, grow and sporulate on just about any dead plant tissue. This means that inoculum of BGM is always present and if conditions favour BGM, it will occur irrespective of what has happened earlier in the season.

To reduce the risk of BGM in 2017 chickpea crops.

- Avoid planting chickpeas next to paddocks where BGM was an issue the previous season.
- Sow in the later part of the planting window as this will reduce biomass production; BGM is favoured by dense canopies.
- Utilise wide rows to improve airflow and allow more rapid drying after rainfall or dew. This will delay canopy closure and improve penetration of late season fungicides.
- In seasons and situations favourable to the disease, a preventative fungicide spray immediately prior to 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 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 chickpea BGM have eradicant activity, so their application will not eradicate established infections. Consequently, timely and thorough application is critical.