

FUSARIUM WILT IN MUNGBEAN FACT SHEET

Minimising the risk of Fusarium wilt in the northern region

Photo: Lisa Kelly, DAF Queensland



Large patch of plants infected with Fusarium wilt. Affected plants yellow and wilt.

KEY POINTS

- Fusarium wilt is becoming an increasing threat to mungbean growers in Australia
- The disease can cause significant reductions in grain yields during favourable seasons and is almost impossible to eradicate from infected fields
- Disease prevention is the best management strategy. Growers should practise good farm hygiene, avoid planting into previously infected paddocks, choose varieties with higher levels of tolerance, and minimise crop stress

Introduction

Fusarium wilt in mungbean is caused by fungi within the *Fusarium oxysporum* and *F. solani* species complexes and has become a substantial issue to many mungbean growers in Australia. It can cause significant reductions in grain yields during favourable seasons and is almost impossible to eradicate once it is in a paddock.

Symptoms

Plants may be infected at any stage of growth; however, symptoms are more frequently seen on maturing plants after flowering. The first external symptoms to become obvious include yellowing and wilting of lower leaves. These symptoms progress to wilting and yellowing of the entire plant. Plants infected early often die; surviving plants may remain stunted. Internal symptoms can be assessed by cutting open the lower stem. Discolouration of the vascular tissues, both above and below the soil line, is a diagnostic symptom of Fusarium wilt. A root rot is often present in infected plants.

Survival and spread

The pathogens that cause Fusarium wilt produce resistant spore structures (chlamydo-spores) that can survive in soils for many years. The movement of infected soil and crop debris through machinery, vehicles, footwear and irrigation or floodwater can quickly spread the pathogens to new paddocks. Once introduced to a paddock, the pathogens that cause Fusarium wilt are almost impossible to eradicate. The pathogens are specific to mungbean but can survive in the absence of a mungbean crop as saprophytes on decaying residues in the soil or as endophytes in the roots of other asymptomatic hosts.

Glasshouse studies have demonstrated that these pathogens can survive as endophytes in the roots of chickpea, soybean, cotton, sorghum and barley without causing any disease. It is likely that these pathogens would also survive on other hosts.

Economic impact

Fusarium wilt has become a significant issue over the last decade for many mungbean growers, particularly those across southern Queensland. It is estimated that the disease caused losses of approximately \$4.8 million in the 2020-21 season. There are no fungicide options available to manage the disease. Successive plantings of mungbean will increase the population of Fusarium in the soil. If this build-up of fungal inoculum is not adequately managed, the potential losses due to the disease may make mungbean production unviable in affected paddocks.

Photo: Lisa Kelly, DAF Queensland



Early infection of Fusarium wilt in mungbean seedlings causes leaf yellowing and browning followed by wilting and often death.

Photo: Lisa Kelly, DAF Queensland



Wilting and death of lower leaves in plants infected with Fusarium wilt.

Variety choice

All commercial mungbean varieties are susceptible to Fusarium wilt, but some appear to be more severely affected than others. Recent field experiments in 2022 indicate that of the mungbean (*Vigna radiata*) varieties, Opal-AU[®] offers the best source of tolerance to the Fusarium wilt pathogens. Jade-AU[®] and Crystal[®] are both highly susceptible. The black gram (*Vigna mungo*) cv. Onyx-AU[®] has improved tolerance over Opal-AU[®].

Management

There are some steps that can be taken to minimise the risk of developing or spreading Fusarium wilt.

- Avoid planting mungbean into paddocks with a history of Fusarium wilt.
- Practise good farm hygiene and use the 'Come Clean Go Clean' strategy to minimise the spread of disease.
- Sow varieties with improved tolerance.
- Manage the crop to avoid stresses such as root damage and waterlogging. Preliminary studies have indicated that the severity of Fusarium wilt may be greater if the root lesion nematode, *Pratylenchus thornei*, is also present.
- Inspect the crop regularly for disease symptoms. Minimise or avoid movement through affected areas of the paddock. Traffic affected areas last when carrying out farm operations and wash down between paddocks.
- Avoid planting mungbean in the same paddock for at least three years.
- Effectively manage volunteer mungbean and weeds that may host the disease.

Photo: Lisa Kelly, DAF Queensland



Brown discoloration of the vascular tissues in a plant with Fusarium wilt.

Photo: Lisa Kelly, DAF Queensland



Plants with Fusarium wilt often have root rot symptoms.



Photo: Lisa Kelly, DAF Queensland

Early infection of Fusarium wilt in mungbean seedlings causes leaf yellowing and browning followed by wilting and often death.

FREQUENTLY ASKED QUESTIONS

What are the key risk factors for Fusarium wilt?

The key risk factors are:

- sowing of susceptible varieties;
- poor farm hygiene;
- crop stress – for example, water stress, nematodes, compaction, climate extremes; and
- successive plantings of mungbean.

Can Fusarium wilt be confused with other crop problems?

Fusarium wilt symptoms may be confused with other diseases, such as tobacco streak virus. Symptoms may also be confused with nutrient deficiencies, waterlogging or other stresses that can cause poor root growth. Discolouration of the vascular tissues, both above and below the soil line, is a diagnostic symptom of Fusarium wilt. Contact an agronomist or plant pathologist for help with diagnosis.

Where can I send plant samples for diagnosis?

Plant samples can be submitted for disease diagnosis to Lisa Kelly at the Queensland Department of Agriculture and Fisheries at 203 Tor Street, Toowoomba, QLD 4350. Please ring or email before submitting samples.

USEFUL RESOURCES

Mungbean Fusarium wilt article on **The Beatsheet**:

thebeatsheet.com.au/have-you-seen-this-mungbean-disease-recently

Fusarium wilt images: thebeatsheet.com.au/disease/image-by-disease/fusarium

Fusarium wilt GRDC video: youtube.com/watch?v=4Dv0d1yQE4M

Mungbean Disease Ute Guide: grdc.com.au

DAF Queensland grains diagnostic services: lisa.kelly@daf.qld.gov.au

GRDC CODE

DAQ1806-003RTX

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