

17.1 Background

Charcoal rot is caused by the soilborne fungus *Macrophomina phaseolina*.

The fungus has a wide host range, and summer crops such as soybean, sorghum, maize, mungbean and sunflower are particularly susceptible. Charcoal rot of the seed (e.g. for the mungbean sprouting market) can also occur, causing a soft, wet rot of the sprouts during germination.

Macrophomina is widespread, lacks host specificity (more than 500 weed and crop hosts) and when it does lack a host, the microsclerotia produced enable its survival in the soil for many years.

IMPACT

- Significant yield losses in sorghum are mostly associated with lodging when hot, dry conditions have resulted in high disease incidence. International research reports yield losses of 50% during prolonged hot, dry conditions.
- In summer crops incidence and lodging from charcoal rot were highest in central Queensland where up to 30 to 40% total yield losses were associated with lodging, and patches of up to 90% in-field lodging were evident.
- Charcoal rot is the most common disease of soybean in Australia and can cause the premature death of an entire crop.

- In WA during 2014, charcoal rot in lupins was reported to cause premature senescence when crops were exposed to high temperatures and moisture stress during pod set.
- Charcoal rot can also cause significant yield loss in sunflowers, with infections usually occurring in moisture-stressed crops when soil temperatures are above 35°C.
- Infections can impact the marketability of sprouting grade beans.

WHERE DAMAGE IS MORE LIKELY

- Charcoal rot of soybean is widespread in Australia and has been found in all mainland states and territories. Most records are in the eastern farming systems from Victoria to central Queensland.

HOW TO USE RESULTS

- To rank paddocks based on inoculum levels to prioritise sowing varieties with different classifications for resistance to charcoal rot.
- Monitor changes in inoculum during different phases of the cropping sequence.
- Confirm diagnosis in-crop, symptoms can be confused with other stem and root rot diseases such as phytophthora root rot, collar rot, fusarium wilt or stalk rot.

NOTE: To ensure the most accurate results, sampling must include correct stubble specimens. Preliminary research results indicate adding 30 small pieces of stubble (1 cm long split longitudinally) from between crown and first node of previous soybean, sorghum, maize, mungbean and sunflower crops are required.

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