



With the summer cropping season nearing completion, growers are hoping for an above average yield of sorghum crop for the 2017/2018 summer growing season in the Northern Region. Crops looked good as of the end of January (Figure 1), but by mid-February tweets were flying and phone calls were being received by USQ's Centre for Crop Health about increasing lodging in crops (Figures 2-3).



Figure 1. Sorghum crop in Bongeen Qld, January 2018. Source: Dante Adorada USQ



Figure 2. Sorghum lodging at Brookstead Qld, 21 February 2018. Source: Dante Adorada USQ.



Figure 3. Sorghum lodging at Condamine, Qld, 16 February 2018. Source: John Sheppard.

The culprit is charcoal rot disease, caused by the fungus *Macrophomina phaseolina*. Splitting sorghum stalks longitudinally will show microsclerotia, the survival structure of the fungus, giving the internal stalk tissue a peppered look (Figure 4). The disease is common during seasons with prolonged hot, dry weather or when other unfavorable environmental conditions stress the plant. It is a major sorghum stalk rotting disease, which can lead to plant lodging.

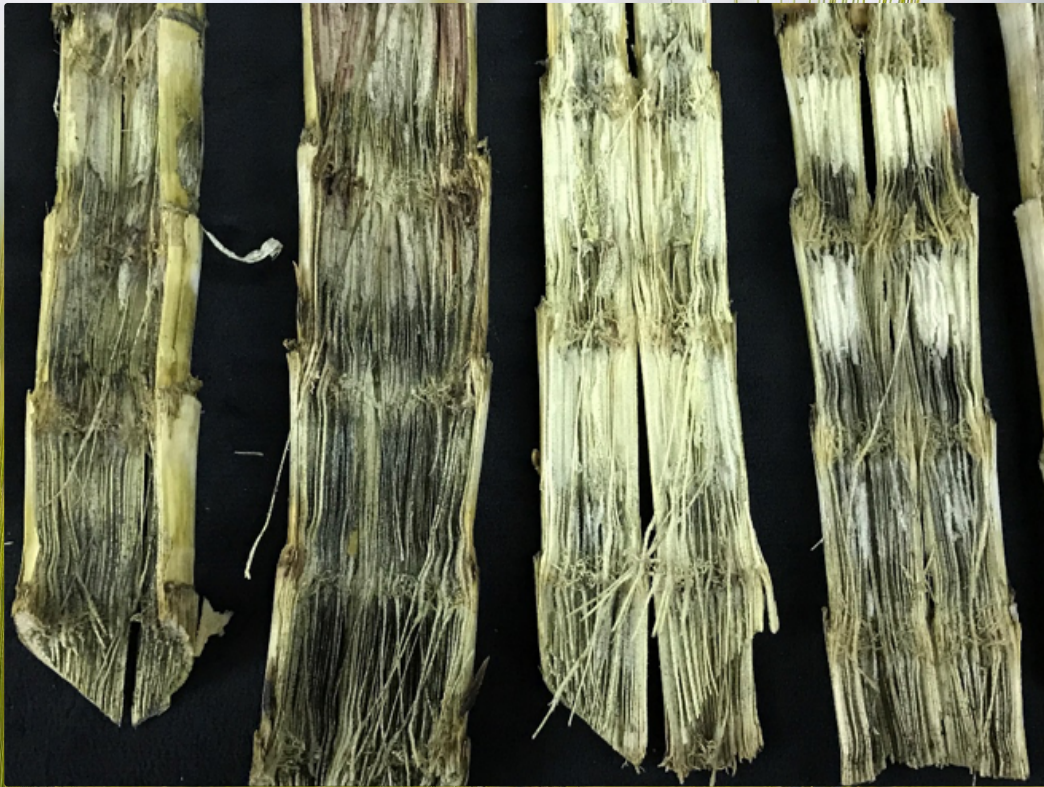


Figure 4. Charcoal rot symptoms. Source: Dante Adorada USQ.

The fungus infects via the roots at any time during the season but symptoms are not normally observed until at, or near harvest when lodging is presented. Predisposing conditions include:

- high plant populations;
- leaf diseases;
- frost or hail damage;
- mechanical damage;
- crop desiccation;
- excess nitrogen fertilization;
- insect feeding, and;
- hot, dry conditions throughout the season.

Unfortunately, little can be done for the current season to correct the problem. Growers and agronomists are encouraged to re-visit guides and resources to understand the disease and options to manage charcoal rot in coming seasons.

Best management practices for managing charcoal rot include:

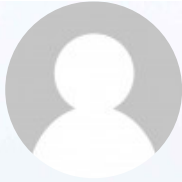
- Managing soil moisture by planting into adequate moisture and observing proper plant population densities and row spacings.
- Using proper fertiliser rates to maintain adequate nutrition, avoid excessive nitrogen or low levels of potassium.
- Planting stay-green hybrids with good scores for charcoal rot, standability, and drought tolerance.
- Using defoliant judiciously as they can act as a stressor and can lead to further infection and harvesting in a timely fashion after a desiccant has been applied.
- *Note that foliar fungicide applications are NOT effective in controlling stalk rot diseases and should not be used.*

The fungus is soilborne and wide-spread throughout Australian paddocks. Surviving up to four years in the soil as microsclerotes, it can infect more than 400 species of plants including all major summer field crops and many weeds. Despite the lack of any formal quantification in Australia, significant yield losses have been associated with lodging, where prevailing hot dry conditions have resulted in widespread high incidences of *M. phaseolina* and subsequent lodging. Losses associated with lodging varies and is dependent on the ability of individual growers to retrieve lodged heads with harvesting equipment available.

Further information on charcoal rot

2017 Mungbean and sorghum disease update – GRDC Jondaryan Updates (<https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2017/07/mungbean-and-sorghum-disease-update>)

Disease control in summer crops and management strategies to minimise financial losses (<https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers>)



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