



Integrated Disease Management for: Seedling diseases

The pathogens:

Rhizoctonia solani, *Pythium* spp. and *Fusarium* spp. Seedling diseases may be caused by numerous pathogens acting alone or in combination that commonly cause 'damping off' (death of seedlings) and reduced plant stands. The main pathogens attacking cotton seedlings are *Rhizoctonia solani*, *Pythium ultimum*, and *Fusarium* spp. (not the *Fusarium* wilt pathogen).

Symptoms

- Pre-emergent seed rots
- Post-emergent damping off (wilting, collapse and death of seedlings)
- Slow early season growth, small cotyledons and reddened hypocotyls
- Lesions on roots

Affected plants may be scattered across the field or concentrated in poorly drained areas. In some situations seedling diseases may be particularly evident in rows where other factors such as fertiliser placement, herbicide application, planting depth etc. have had an effect.

Economic impact

Actual and potential costs associated with seedling diseases include:

- The cost of standard seed treatment fungicides used by all growers
- Replant costs including seed, fuel, labour and in



Seedlings with characteristic brown girdling of stem caused by *Rhizoctonia*.

- some situations, extra water
- Cost of late season insect control which can be expensive
- Yield reductions associated with late replants or delayed maturity

Favoured by

Anything that slows down germination and seedling growth favours infection by pathogens causing seedling disease pathogens. This includes cool and/or wet weather, poorly formed beds, compaction, waterlogging, incorrect planting depth, poor placement of fertiliser (under the plant line), excessive rates of herbicide at planting, movement of herbicide into the root zone (i.e. by rain) and infection by other pathogens.

Dispersal

Seedling disease pathogens are easily dispersed with soil and plant residues by wind or water and by the activities of man. They are present in most soils.

Survival

These fungi can survive indefinitely as saprophytes on plant residues in the soil.

Host range

Seedling disease pathogens have a wide host range and can survive on the residues of many crops and weeds. There is some evidence that seedling diseases may be more severe after incorporation of legume residues.

Control strategy

PLANNING

- Use a variety with good seedling vigour
- Use effective seed treatment fungicides

GROUND PREPARATION

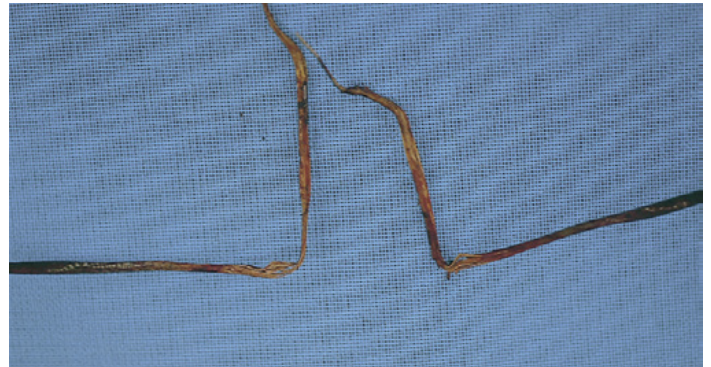
- Plant into well prepared, high, firm beds
- Carefully position fertiliser in the bed – not under the plant line

PRE-PLANTING

- Plant into moisture rather than planting dry and watering-up

AT PLANTING

- Delay planting until temperature and moisture conditions are optimum
- Be careful with the use of herbicides at planting



Characteristic soft rot and stem collapse of cotton seedling caused by *Pythium* sp.

ROTATIONS

- Incorporate rotation crop residues as soon as possible after harvest (especially legume crop residues)

Assessment

Estimate the stand by counting the number of established plants/metre on at least 20 sites across the field. The difference between the estimated stand count at 6-8 weeks after planting and the number of seed/metre sown indicates the level of seedling mortality. Seedling mortality includes the effects of seedling pests such as wireworms and incorporates seed viability.

An alternative method is to estimate stand immediately after emergence and again 6-8 weeks later.

For more information:

- Visit www.cottoninfo.net.au
- Download the *2014-15 Cotton Pest Management Guide* from www.cottoninfo.com.au/publications

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This fact sheet has been adapted for CottonInfo from the former Cotton Catchment Communities CRC publication *Integrated Disease Management*, which was authored by Stephen Allen, David Nehl and Natalie Moore.

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