



Integrated Disease Management for: Fusarium wilt

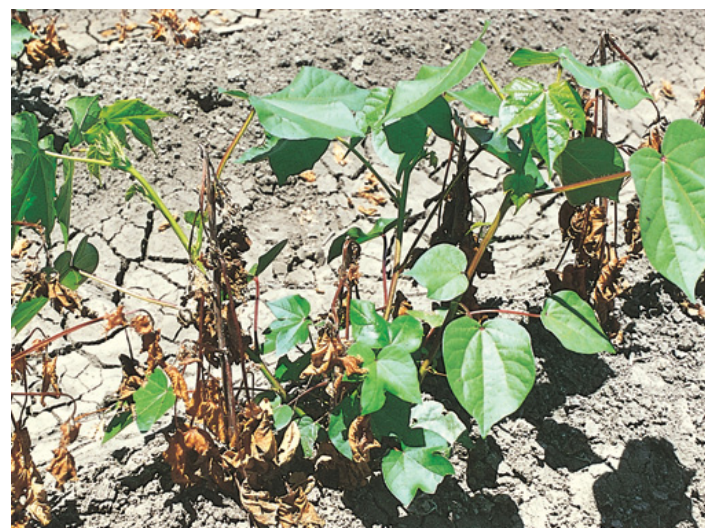
The pathogen

Fusarium wilt, caused by the soil-borne fungal pathogen *Fusarium oxysporum* f. sp. *vasinfectum* (FOV), is almost impossible to eradicate following introduction and can result in fields becoming unsuitable for cotton production. A number of strains are present in Australia; however, if new exotic strains (races) were introduced, new management strategies and resistant varieties would be required. In addition, some exotic races are more damaging, particularly in association with nematode pests.

Symptoms

External symptoms include stunted growth and dull and wilted leaves followed by yellowing or browning of the leaves and eventual death from the top of the plant. Some affected plants may reshoot from the base of the stem. External symptoms can appear in the crop at any stage. Most commonly symptoms become apparent in the seedling phase when plants are beginning to develop true leaves, or after flowering during boll fill. Symptoms can appear as individual plants or as a small patch, often but not always, near the tail drain or low-lying areas of the field.

Internal symptoms can be checked by cutting the stem. An affected plant will reveal continuous brown discolouration of the stem tissues running from the main root up into the stem. The discolouration is



Seedling death.

similar to that of *Verticillium* wilt but usually appears as continuous browning rather than flecking.

Economic impact

Once introduced to a field or farm, the pathogen is almost impossible to eradicate. FOV can persist in the absence of cotton plants by surviving as a saprophyte on decaying residues in the soil and may be quickly dispersed to other fields via the irrigation system and movement of infested soil. Failure to control the build-up of the disease results in fields becoming unsuitable for cotton production.

Favoured by

- Use of susceptible varieties.

- Stresses in the crop – e.g. waterlogging, root damage through cultivation, cool and wet growing conditions.
- Poor farm hygiene on and between farms and between districts.

Survival

There is no commercially viable way to eradicate this pathogen from infested soil. Spores are effectively spread over long distances in infested soil attached to boots, vehicles and farm equipment, and in water (irrigation and overland flows). It can also be transferred in infested plant material, including seed.

Host range

The pathogen is specific to cotton but can also live in the residues of most non-host crops. Bladder ketmia, sesbania pea, dwarf amaranth, bellvine and wild melon are alternative weed hosts that show no external symptoms. These weeds may act as an on farm reservoir for the pathogen and need to be managed in-crop and during fallow periods.

Control strategy

PLANNING

- If your farm is free from this disease, try to keep it this way! Ensure all farm staff and contractors practice good farm hygiene and Come Clean Go Clean.
- Select varieties with a high F rank
- Use BION[®] Plant Activator, a seed treatment that helps protect seeds and emerging plants from Fusarium wilt and Black root rot.

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Vascular discoloration.

PLANTING

- If possible, delay planting until soil temperatures are 16 °C and rising.

IN CROP

- Manage the crop to avoid stresses such as waterlogging, over-fertilisation and root damage.
- Avoid mechanical inter-row cultivations if possible, as this causes root damage and provides an entry point for the pathogen.
- Conduct regular field inspections for early detection and containment of isolated outbreaks.
- Isolate affected areas from irrigation flows and traffic to avoid spreading the pathogen.
- Minimise tail water from affected fields.

AFTER HARVEST

- After harvest, root pull and retain crop residues on the surface for at least month prior to incorporation. Raking and burning the whole field is NOT an option as raking is likely to spread the pathogen (if present).
- The pathogen can survive on non-host crop residues, so residues should be buried or baled as soon as possible after harvest. Avoid green manure crops.

ROTATIONS

- Rotate with non-hosts for up to 3 years. Hosts

such as legumes can potentially increase disease incidence. A summer sorghum/maize-fallow-cotton rotation can increase cotton plant survival, reduce disease incidence and increase yield in the third year compared to continuous cotton.

Assessment

Establish a transect across the field and assess for the presence or absence of disease symptoms in ten plants in every tenth row. The presence of the disease is best determined by checking for the characteristic brown internal discolouration within the lower stem.

Sending plant samples for diagnosis

It is important that all new outbreaks of Fusarium wilt are diagnosed by a pathologist to determine what strain of pathogen is present.

Please PHONE FIRST before sending any samples to confirm the address and to ensure that samples will be processed appropriately on arrival. Avoid sending samples late in the week when they may be delayed over the weekend.

Include information about the sample (see page 126



Foliar chlorosis (yellowing) and necrosis (brown, dead tissue).



Often observed as dead plants at the tail drain.

of the 2014-15 Cotton Pest Management Guide for a form and checklist on sending plant samples for diagnosis).

Send samples to:

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Dutton Park 4102

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.