

Technical fact sheet

Fusarium wilt (exotic strains)

What is it?

Fusarium wilt is a fungal disease caused by the soil-borne pathogen *Fusarium oxysporum* f. sp. *vasinfectum* (*Fov*). Strains of *Fov* were identified in Australia in 1993, which had evolved locally. Once introduced, this pathogen is almost impossible to eradicate and failure to control build-up of the disease results in fields becoming no longer suitable for cotton production.

If new exotic strains (races) were introduced into Australia from overseas the difficulty of management strategies increases as new resistant varieties would be required. In addition, several races found in other regions of the world are more damaging than those already established in Australia, particularly in association with nematode pests.

Plant resistance to races of *Fusarium* that require the presence of nematodes to be effective has been achieved overseas by incorporating plant resistance to nematodes. However, Australian cotton varieties are bred in the absence of nematode pressure and have little or no resistance to nematodes. The newer Australian varieties with improved resistance to the Australian races of *Fusarium* have not been screened against the US races of *Fusarium*.

What do the symptoms look like?

External plant symptoms include stunted growth, wilted leaves followed by yellowing or browning and eventual death from the top of the plant. Internal symptoms can be seen when the stem is cut lengthways and consist of a continuous brown discolouration of stem tissues. This is most apparent in the lower stem and upper taproot.

Certain strains of the causal fungus only cause symptoms when plants are also infected with the root-knot nematode. In those cases, galls are usually prevalent on lateral roots. Australian strains of *Fusarium* wilt do not require nematodes to cause symptoms.

It is not possible to determine what strain of pathogen is affecting a plant (indigenous or exotic) based on plant symptoms alone, as plants infected with different strains will exhibit similar symptoms. Therefore it is extremely important to have all new outbreaks of *Fusarium* wilt analysed by a pathologist to determine what strain of pathogen is present – VCG 01111, VCG 01112, a new locally evolved strain or an exotic strain.



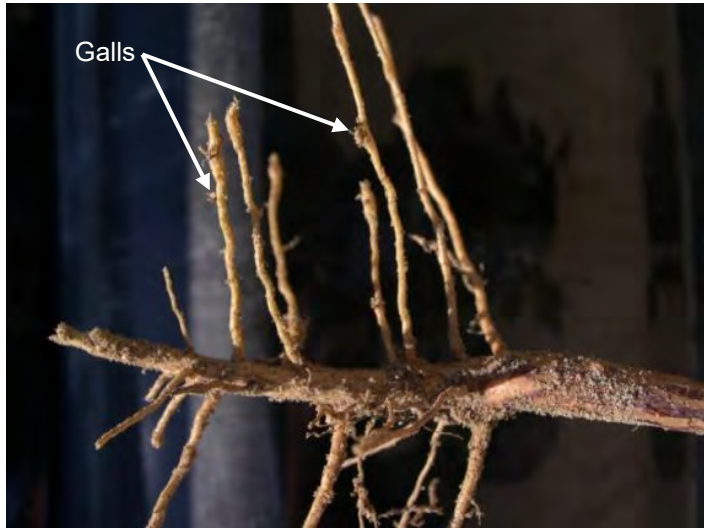
Yellowing of leaves with characteristic necrotic, brown leaf margins developing in young plants



Plants affected at a range of growth stages, with plants killed by *Fusarium* at 3-4 leaf stage evident (right) next to older plants that are either unaffected (far left) or with moderate lower leaf shedding (middle)



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Cotton roots infected with Race 1 *Fov* (USA) and root knot nematode. Galls produced in response to nematodes' feeding can be seen on roots.



Chris Anderson DPI NSW

Cross-section of a cotton stem infected with Race 1 *Fov* (USA) and root-knot nematodes, showing vascular discoloration and galls

What can it be confused with?

Symptoms of Fusarium wilt and Verticillium wilt are similar. Verticillium wilt has dark brown to black streaks through the centre of the stem when cut diagonally. When cut longitudinally, vascular discoloration exhibits flecking of the inner tissues, rather than continuous browning associated with Fusarium wilt infected plants.

How does it spread?

There is no commercially viable way to eradicate this disease from the soil, and it can spread across fields, farms and regions. 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 infected plant material, including seed.

Where is it now?

This disease has been recorded in every cotton-growing region in the world; however, the race spectrum varies. Currently eight races (genotypes) of *Fov* have been described throughout the world.

How can I protect my farm from Fusarium wilt?

Check your farm frequently for the presence of unusual symptoms. Make sure you are familiar with common cotton pests so you can tell if you see something different. Have all new outbreaks of Fusarium wilt analysed by a pathologist to determine what strain of pathogen is present.

If you see anything unusual, call the Exotic Plant Pest Hotline on 1800 084 881.



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