New strain of Verticillium wilt
Verticillium wilt of cotton is caused by *Verticillium dahliae*, a soil borne fungus that enters the roots and grows into the vascular system of the plant.

CRDC-funded research by cotton pathologists have identified a new strain of the pathogen in NSW. Linda Smith of DAFF QLD, Karen Kirkby of NSW DPI, Stephen Allen of CSD, Susan Maas of CRDC, along with the CottonInfo and CSD E&D teams have joined forces to bring you this summary.

What new strain do we have?
The new straing is called VCG 2A, whereas the most common strain in Australia is thought to be VCG 4B. At this stage, we don’t know how widespread this new strain is. Both are regarded as non-defoliating types.

Why was it so severe this season?
Favourable weather in November when it was relatively cool meant innoculum levels were able to build. Severe heat in February put the plants under stress which allowed the disease to take hold. Studies under controlled environmental conditions suggest that in general VCG 2A is no more virulent that VCG 4B; however there is considerable range in virulence within each of these VCG’s.

Symptoms:
Vascular discoulouration or browning extending throughout the stem and into petioles. Plants rarely wilt, but may defoliate prematurely at the end of the season. Leaves develop a characteristic yellow mottle at the edges and between the veins. Lower leaves are usually affected first. Dead tissue develops at the leaf edges and may replace the mottled areas. The mottle can be diffuse or angular.
Management considerations:
The NSW DPI pathology team are currently undertaking a large number of trials looking at different aspects of Verticillium management. At this early stage, it is not understood if management options will vary between VCG 2A and 4B, however generally management for Verticillium wilt is the same regardless of VCG.

• **Resistant varieties:** Resistant cotton varieties are the industry’s primary tactic to managing this disease. The level of resistance is communicated through the V-Rank which is assigned to each variety. Varieties that are resistant at 25-27°C are susceptible at 20-22°C.

• **Manage for ‘earliness’:** Verticillium wilt is most severe during extended wet weather and or waterlogging and in late maturing crops. Verticillium wilt is favoured by cooler temperatures. Extending the period of crop growth late in the season increases this risk.

• **Irrigation management:** Throughout the season avoid over-watering waterlogging where possible and avoid late season irrigations that extend maturity. Minimise tailwater to reduce risk of spread.

• **Nutrition management:** Verticillium wilt is also favoured by excessive use of nitrogen which results in late season growth. Potassium is important for natural plant defences and potassium deficiency is associated with more severe symptoms.

• **Non-host crop rotation:** Crop rotation with non-host crops (ie. sorghum and cereal crops) may help reduce Verticillium wilt incidence. It is unlikely that rotation alone will provide satisfactory results. Research suggests that the greatest benefit from rotation would be observed when the rotations are initiated early, before inoculum builds up to high levels in the soil.

• **Control alternative hosts:** Including volunteer and ratoon cotton, sunflowers, soybeans. In addition to alternative crops, the pathogen that causes Verticillium wilt can also infect common weeds found in cotton growing regions such as noogoora and Bathurst burr, saffron thistle, thornapple, caustic weed, bladder ketmia, burr medic, black bindweed, pigweed, devils claw, turnip weed, mintweed, blackberry nightshade and others. Adopt a zero tolerance approach.

• **Incorporate cotton residues soon after harvest:** Aim to ensure that crops destruction occurs soon after picking to reduce the build-up of inoculum. Where Verticillium wilt is present, incorporation of cotton residues soon after harvest is beneficial allowing for the rapid breakdown of plant material.

If you suspect Verticillium please send several pieces of the lower stem of an affected plant (approx 10cm) in cardboard post pak to:
Dr Linda Smith
DAFF QLD - Eco Sciences Precinct
Basement 3 loading dock
off Joe Baker St
Dutton Park QLD 4012

Post on a Monday not Friday, and be sure to include details on when and where samples were collected, variety, symptoms, and distribution of affected plants. Results are confidential unless otherwise directed.

And remember, always...

**Come Clean. Go Clean.**