

After some much needed rain last week, the associated front also brought a cool change which saw temperatures plummet. The CSD Extension & Development (E&D) team are expecting physical symptoms of Verticillium wilt to become obvious in cotton fields a week to 10 days post the change.

### THE DEFOOLIATING STRAIN

Much has been said about the impact of the defoliating strain of Verticillium wilt on cotton crops in Australia. Initially, all the strains of Verticillium wilt within Australia were thought to be a mild strain compared to isolates from other areas of the world. However, due to identification technology not being available until recently, a defoliating strain has been identified within the isolates taken from Australian field samples.

The initial sample of the defoliating strain was collected in 1984 from the Gwydir Valley, and because of this, although creating issues in crops; it cannot be classified as a new disease. More likely the inoculum levels have been building up in fields gradually over the years and when conditions are aligned things can turn very quickly.

It is important to note that identification of strains of Verticillium as defoliating and non-defoliating is a classification and does not necessarily indicate the severity of the particular isolate present. Both types have the ability to cause severe symptoms including crop defoliation.

Regardless of the strain, the management principles for this disease remain the same. Identification of Verticillium wilt opposed to Fusarium wilt has become more difficult and cannot be easily determined in the field.

### THE INFLUENCE OF TEMPERATURE ON RESISTANCE

Cotton varieties that are less susceptible to Verticillium wilt are the cornerstone for management of this disease. The level of resistance is communicated through the V. rank which is assigned to each variety.

Temperature highly influences the incidence and severity of Verticillium wilt. Resistance to Verticillium wilt is temperature sensitive; therefore, a variety which has a high V. rank will see the resistance to the disease at 25-27°C diminish in cooler temperatures, becoming susceptible at average temperatures of 20-22°C.

Over the first week of February, the average dropped below 25°C in many cotton growing districts. The milder temperature regimes, (below what we have come to expect) as well as rainfall and associated cloud cover, have provided conditions ideal for Verticillium wilt. Thus, regardless of the Verticillium wilt resistance rankings shown in Table 1, the ability of the plant to combat the infection by the pathogen is diminished.

**Table 1:** The disease rankings for popular Australian cotton varieties.

	V. Ranks	F. Ranks
Sicot 714B3F	112(12)	128(8)
Sicot 707B3F	111(13)	116(2)
Sicot 71BRF	107(6)	120(30)
Sicot 748B3F	103(15)	132(6)
Sicot 746B3F	102(15)	135(6)
Sicot 711RRF	102(5)	99(4)
Sicot 74BRF	101(6)	127(24)
Sicot 754B3F	94(12)	152(6)
Sicot 812RRF	94(4)	113(4)
Sicot 75RRF	88(5)	121(4)
Sicot 730	88(3)	109(10)

### SYMPTOMS OF THE DISEASE

Verticillium wilt is characterised by:

- Leaf mottling, yellowing between the leaf veins and around the leaf margins.
- Vascular discolouration or browning, extending throughout the stem and into the petioles.
- Root system appears otherwise healthy.
- Plants may be stunted, and defoliation may occur.

### IT IS EASY TO CONFUSE VERTICILLIUM WILT WITH FUSARIUM WILT

This season weather conditions have also favoured Fusarium wilt. Without further pathology tests it is very easy to confuse the symptoms of Verticillium and Fusarium wilts, as many of the symptoms are similar. The best way to assess the infected plants is to cut the stem length ways from root to tip.

- Fusarium wilt will reveal a continuous brown discolouration.
- Verticillium wilt appears as flecks along the stem (not continuous).

For confirmation, samples should be referred to a plant pathologist. Please contact your local CottonInfo REO to determine the appropriate pathologist and address for submitting sample. A diagnostic form can be downloaded [HERE](#).



**Figure 1:** Verticillium wilt (left) - Fusarium wilt (right).

### MISDIAGNOSIS WITH PREMATURE SENESCENCE

In recent years, we have seen an increased prevalence of premature senescence, particularly in varieties such as Sicot 714B3F and Sicot 707B3F. Premature senescence is primarily a disorder of potassium deficiency caused by an imbalance in the sink and source relationship. The crop has a high boll load and is unable to meet the demands, so it reallocates potassium from the leaves.



**Figure 2:** Verticillium wilt (left) and premature senescence (right).

### CONTROL STRATEGIES FOR VERTICILLIUM WILT

- Use resistant varieties consistently - V. ranks above 100 (the higher the better).
- Provide a balanced crop nutritional program, especially nitrogen and potassium.
- Minimise periods of waterlogging through specific irrigation management.
- Manage the crop for earliness and avoid late season irrigations.
- Incorporate crop residues as soon as possible after harvest.
- Rotate with non-host crops such as sorghum and cereals.
- Control alternate weed hosts such as Noogoora and Bathurst burr, thornapple, bladder ketmia, burr medic, pigweed, turnip weed.
- Conduct a disease survey of your own after harvest to understand and monitor disease incidence.

### COMPILED BY THE CSD EXTENSION & DEVELOPMENT TEAM, FOR MORE INFORMATION CONTACT

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