Disease

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Emergence of Tobacco Streak Virus

The potential impact of TSV to cotton in Australia has not been established however it is currently thought that TSV is unlikely to cause significant disease or losses in CQ. Disease risk most likely increases with proximity to significant parthenium weed populations.

TSV older volunteer cotton

Background

Tobacco Streak Virus (TSV) was identified in 2006 as the cause of severe dieback in sunflower crops in the Central Highlands in recent years. Additionally in the 2006/07 summer, many mungbean crops were also affected by TSV with impacts on yield ranging from minor to severe. TSV has now been found in several cotton crops within the irrigation area of Emerald.

Symptoms of TSV in cotton

Symptoms included dark purple necrotic, spreading lesions on leaves, sometimes forming numerous diffuse ring spots. On plants with numerous necrotic lesions the upper leaves sometimes also display chlorotic mottle and deformed, down-curled leaves.

Symptoms in young cotton crops are generally mild and consist of single, diffuse necrotic lesions on one leaf of infected plants.

How is TSV transmitted?

TSV is transmitted by infected pollen, which can be spread by wind or carried by insects. Thrips are the only known insect vector and are required for TSV infection to occur. Transmission of TSV to plants relies on the virus from infected pollen to entering plant cells through the feeding injury caused by thrips. TSV can only survive on living plant tissue or pollen. Many species of thrips are potentially capable of transmitting TSV.

Cotton Catchment Communities CRC

Seed transmission of TSV does occur in some hosts and several common broad-leaf weed species are hosts of TSV. Parthenium weed is a widespread and key host of the virus in Central Queensland. There is no risk of Australian cotton seed carrying TSV as seed production crops are not currently grown in CQ by either CSD or Deltapine Australia.

Risk factors

The risk of TSV infection is dependent on;

- the density of infected pollinating weed host plants in the environment (particularly Parthenium)
- the number of thrips feeding on the crop
- the susceptibility of the crop to TSV.

TSV appears to be present and at high incidence in the Parthenium population throughout its range in CQ regardless of its proximity to cultivation. TSV is also highly transmissible in Parthenium seed, so therefore is maintained in the Parthenium population from season to season.

Early research findings and likely impacts

There is currently a CRDC funded project to determine the likely impacts of TSV on cotton in Australia. Preliminary results from glasshouse trials and field surveys suggest that TSV may not cause significant disease or losses in CQ cotton.

Currently within the commercial cotton crops surveyed a low percentage of plants were infected with TSV and expressed mild symptoms only (see Figure 1). Higher levels of infection were only observed in volunteer plants near a Parthenium infestation (see Figure 2).

These observations suggest there is no current crisis for industry. However, growers and consultants are encouraged to maintain farm hygiene and be on the look out for the described symptoms.

TSV young plant single lesion

TSV symptoms

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