

Reoccurring wilt: Possible new cotton disease

■ By Linda Smith – Qld Department of Agriculture and Fisheries

AT A GLANCE...

Queensland DAF pathologists are currently investigating whether a likely new fungal species is the cause of dying plants reported in Central Queensland, Gwydir and Namoi cotton fields.

OVER the past couple of seasons, a potential new fungal pathogen has presented on multiple farms in the Central Queensland region with reoccurring patches of dying plants. The same potential pathogen under investigation was isolated in NSW from dead plants sampled from the Namoi and Gwydir valleys. Research is underway to confirm whether this likely new fungal species in Central Queensland, the Gwydir and the Namoi is the cause of dying plants in each valley. The distribution across the industry will be assessed in the 2020–21 annual disease surveys.

Known endemic and exotic diseases ruled out

It was first thought that plant death was due to sudden wilt, as the symptoms are very similar to this disease. But this was deemed unlikely for several reasons:

- Wilting and dying plants were observed in the same area over several seasons with the area of affected plants greater each season, whereas sudden wilt does not reoccur in the same location;
- Symptoms were not quite right for sudden wilt as plants had leaf bronzing; and,
- No other factors normally associated with sudden wilt, such as irrigation or rain event followed by bright and hot conditions, was evident.

So sudden wilt, as well as other known endemic diseases have been ruled out. Symptoms also have similarities to the high priority exotic disease Texas Root Rot, but this has been ruled out as the causal pathogen, along with other industry high priority exotic diseases.



Photo 1: Curling of leaves (circled) in the early stages of the disease



Photo 2: Affected plants sporadically wilt and die.

Symptoms

In the early stages of the onset of the condition, leaves of the plant begin to curl (Photo 1).

Plants wilt and quickly succumb to the disease and die (Photo 2).

Leaves and petioles have a bronzed appearance (Photo 3).

The earliest that plants were observed to be affected was at squaring, but plants at varying stages of plant growth were affected (Photo 4).

When the stem was cut horizontally at the base a distinctive red staining of the vascular tissue was evident. Peeling back the bark exposed red streaking in the stem and tap root (Photo 5).

The leaves remain attached after plant death (Photo 6).

The roots may be rotten and easily break off when the plant is pulled from the soil. Fields currently known to have reoccurring wilt, are affected to different degrees. Some fields have only a few plant deaths, while others have sporadic dead plants across large areas of a field. Regardless of the area affected, a similar observation is the sporadic distribution of dead plants amongst healthy plants with no obvious pattern for means of spread.

Distribution, incidence and impact within each valley across the industry

The distribution and incidence across the industry will be assessed in the 2020–21 annual disease surveys, but this will only provide data for selected fields. If you observe plants with symptoms similar to those described, please collect samples and contact your state pathologist for details on where to send them for confirmation of pathogen.

For Queensland contact Linda Smith, Mobile: 0457 547 617, Email: Linda.smith@daf.qld.gov.au

For NSW contact Duy Le, Mobile: 0439 941 542, Email: duy.le@dpi.nsw.gov.au.

It is very important that we also understand the impact this disease has on cotton production. Including information with diagnostic samples such as how many seasons symptoms have been observed, the area impacted, whether the area of diseased plants has increased, and whether any factors such as cultivation, fertilisation etc. is associated with the onset of disease symptoms, will greatly assist in our understanding of this disease.

How to collect plant samples

- Collect multiple samples representing all symptoms and stages of growth affected;
- If possible include a healthy plant or plants, as well as the diseased plant material;
- Collect whole plant samples, including roots;
- Dig them up rather than pull them out, as roots may be rotten and break off;



Photo 3: Leaves and petioles of affected plants have a bronzed appearance.



Photo 4: Varying stages of plant growth are affected.

- Sample can be cut into sections for easier packaging;
- Wrap in dry newspaper or place in paper bag, one plant per bag; and,
- Keep the sample cool and send as soon as possible.

Future work

Once the cause of reoccurring wilt has been confirmed, research will be conducted to understand the basic biology of the pathogen, potential threat to the cotton industry and management.

Funding for this research is provided by CRDC and is greatly appreciated.



Photo 5: Red staining and streaking of vascular tissue in the lower stem and tap root.



Photo 6: Plant death, leaves remain attached.



This QR code is live – give it a go!

Link to video of CottonInfo webinar on reoccurring wilt.
NOTE: Video is 32 minutes long.

