

Tomato chlorotic dwarf viroid in ornamental nurseries

Tomato chlorotic dwarf viroid is a plant pathogen that can infect ornamental plants. Although it doesn't usually cause severe disease, it can be spread rapidly within nurseries and have an impact on biosecurity and market access.

WHAT IS TOMATO CHLOROTIC DWARF VIROID?

Tomato chlorotic dwarf viroid (TCDVd) is a viroid plant pathogen that has been reported to infect a range of *Solanaceous* vegetables and ornamentals. It is a *Pospiviroid* which prefers warmer climates. It multiplies rapidly at temperatures between 25-35°C and more slowly at temperatures lower than this.

While TCDVd does not usually have significant impacts on ornamental nursery production, it can have impacts on biosecurity and market access (e.g., New Zealand require TCDVd testing in tissue culture stock before consignment).

Businesses are advised to monitor their nursery stock for signs of disease and apply strict hygiene measures when handling different host plants.

WHAT DOES IT INFECT?

TCDVd can infect a range of ornamental plants including:

- *Petunia*
- *Petunia hybrida*
- Petchoa (*Petunia x Calibrachoa*)
- Trailing verbena (*Verbena x hybrida*)
- Dwarf periwinkle (*Vinca minor*)
- Lobelia (*Lobelia erinus*)
- Marigolds (*Calendula officinalis*, *Tagetes* spp.)
- Dahlia (*Dahlia* spp.)

It also infects vegetables such as:

- Tomato (*Solanum Lycopersicum*)
- Capsicum (*Capsicum annum*)
- Eggplant (*Solanum melongena*)

WHAT DOES IT LOOK LIKE?

TCDVd does not usually cause symptoms in ornamental plants, although chlorosis (yellowing) of leaves, chlorotic spots, distorted leaves, and stunted growth is sometimes seen (Figs 1 & 2). In general, it can be difficult to detect TCDVd in ornamental nurseries.

TCDVd can cause severe disease and economic loss in tomato, its preferred host. The symptoms that usually occur in tomato plants include chlorosis, stunted growth, distorted leaves, and necrosis (death). The fruit can become split or cracked and be reduced in size.



Figure 1. Petchoa leaves with chlorotic spots



Figure 2. Petchoa leaves with chlorotic spots and distortions (curling)

WHERE IS IT NOW?

TCDVd is present in Victoria, Australia but is not yet known to occur in commercial tomato production areas. It is also currently known to be present in parts of Europe, India, Japan, and the United States.

HOW DOES IT SPREAD?

TCDVd can spread very rapidly within nursery environments.

It transmits via:

- contact between infected and uninfected plants by touching
- people handling infected plants first, and then uninfected plants without applying hygiene measures in between. Even contaminated clothing can transfer the viroid
- tools (e.g., secateurs) and equipment being used on infected and uninfected plants without being sanitised in between
- sowing infected seeds

The viroid can be very persistent on surfaces, so it is important to implement hygiene measures and protocols to minimise the chance of spread and contamination. Insect vectors for TCDVd are not yet known to occur in Australia.

HOW CAN I PROTECT MY NURSERY FROM TCDVd?

There are currently no products available which can prevent or treat TCDVd infection in plants. The only available measure to eradicate the viroid from the immediate premises is to destroy all infected plant material.

To prevent infection:

- use only tested and healthy planting material

To limit spread:

- immediately isolate any suspect plants and limit access by personnel
- always work in “clean” areas before moving into “infected” areas
- sanitise all surfaces, tools, equipment, clothing, and other materials that may have come into contact with infected plants, with 2% Virkon S or 10% bleach (sodium hypochlorite, e.g., White King)
- use disposable gloves when handling suspect plants and change them frequently, particularly when handling different host plants
- change clothes and shoes when leaving “infected” areas. Alternatively, sterilise shoes using foot baths

When disposing of infected plant material:

- deep bury or burn all material. Do not re-use or compost on-site
- use a biosecurity waste disposal service

Additional hygiene measures:

- make equipment and tools room/shed/area specific and do not move them out of the designated spaces
- cover infected plant material and waste with a tarp when transporting them. Sterilise the transport container and tarp with bleach or Virkon S after each trip.
- Ensure that all areas are regularly cleared of plant waste and sterilised.

IMAGE CREDIT

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