

## Viroids (Genus: Pospiviroid)

### What are they?

The Pospiviroidae are a family of viroids, including the first viroid to be discovered, Potato spindle tuber viroid (PSTVd). Viroids are one of the smallest known pathogens of plants. This factsheet covers PSTVd, Columnea latent viroid (CLVd), Pepper chat fruit viroid (PCFVd), Tomato apical stunt viroid (TASVd), Tomato chlorotic dwarf viroid (TCDVd), Tomato planta macho viroid (TPMVd), and other viroids.

### What are the main hosts?

Pospiviroids have been found in Solanaceae: capsicums, eggplants, tomatoes and potatoes.

### What do they look like?

Symptoms of different Pospiviroids may vary. The symptoms of CLVd and TASVd show as visible difference on the leaves (Fig 1 and 2). The symptoms of CLVd are leaf reddening and necrosis (Fig 1). The fruit of glasshouse-grown capsicums affected by PCFVd are approx. half the normal size (Fig 3). Plant growth is slightly reduced, and young leaves of infected plants are slightly smaller and paler than those of healthy plants (Fig 4). Capsicums display only very mild symptoms in response to PSTVd infection. The only visible symptom is a certain 'waviness' or distortion of the leaf margins near the top of infected plants. PSTVd causes distortion in potatoes which become spindle shaped (Fig 4).

### Why are they important?

Losses are associated with reduced plant vigour and health and reduced crop volume and quality. CLVd, PSTVd and TASVd are priority pests for Biosecurity New Zealand.

### How are they transmitted?

Viroids can be transmitted mechanically, via seed, and by infected plant material such as pollen. For example, TASVd has been shown to be transmitted mechanically and via seed. It has also been confirmed that bumble bees can transmit TASVd from infected plants to healthy plants during pollination. TPMVd has not been shown to be seed transmitted but is transmitted mechanically and by aphids. It is also thought that viroids are present in wild plants or ornamentals (but do not show symptoms) and may transfer to crops.

### Where are they present?

As a group, Pospiviroids have been found in virtually all major regions throughout the world although not all are present in every region. In many cases they are identified as eradicated or as 'a few occurrences'.



**Fig 1.** CLVd symptoms on tomato. Image: Defra Crown Copyright (EPPO)



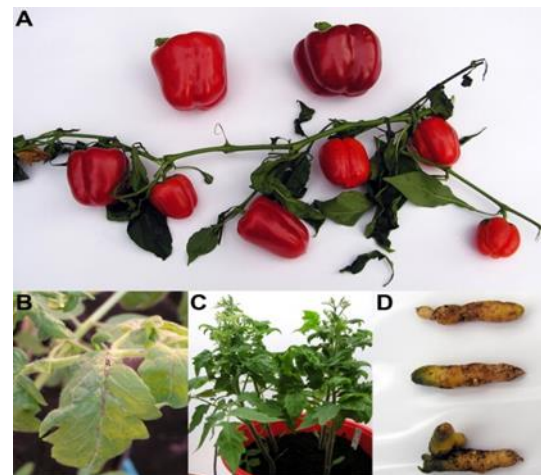
**Fig 2.** TASVd symptoms on tomato. Image: NPPO of the Netherlands (EPPO)

### How can I protect my industry?

Check your production sites frequently for the presence of new diseases and unusual symptoms. Make sure you are familiar with common pests and diseases of your industry so you can recognise something different.



**Fig 3.** A non-infected (left) and two small PCFVd-infected fruits (right). Image: NPPO of the Netherlands (EPPO)



**Fig 4.** PCFVd on capsicum fruit, tomato leaves, potato tubers. Image: Elsevier ©(Verhoeven, 2009)

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