## Stem pitting citrus tristeza

## **By Ron Brlansky**

Since the late 1960s, citrus tristeza virus (CTV) has been an increasing problem for the Florida citrus industry. The main problem over this time period has been strains which cause the decline of trees on sour orange rootstock. Sour orange was long the preferred rootstock for citrus in Florida, as well as in many other countries. The introduction of decline strains of CTV has caused the eventual loss of sour orange as a rootstock.

CTV is transmitted via infected budwood as well as by aphid species. In these early tristeza days in Florida, the decline strains were primarily transmitted in infected budwood and by the melon aphid, *Aphis gossypii*. The pattern of tristeza decline followed times when there were high populations of the melon aphid that spread the virus.

Historically, when the brown citrus aphid (*Toxoptera citricida*) is introduced into a citrus area with decline strains of the virus, the incidence of



Symptoms on a grapefruit plant infected with a severe strain of stem pitting CTV. The symptoms are the leaf yellowing, curling, and vein corking.

decline and death of trees on sour orange usually accelerates and the use of sour orange as a rootstock is discontinued. This has happened in Florida since the brown citrus aphid was introduced in 1995. The brown citrus aphid transmits CTV strains six to 25 times more efficiently than the melon aphid.

Strains of tristeza vary in the rate on which they are transmitted by the brown citrus aphid. The next event in many countries after the aphid's establishment has been the appearance of stem pitting forms of tristeza. Hypotheses are that either stem pitting tristeza virus strains are introduced with planting materials or that the brown citrus aphid is able to more easily transmit such strains that may be present within existing field plants. Recently, we have found that the aphid will transmit severe stem pitting strains more often than non-stem pitting strains from a mixture that contains both types.

Since the brown citrus aphid has been in Florida, only a few instances of stem pitting tristeza have been found and reported (personal communications, D.P.I.).

The damage caused by stem pitting tristeza is multifold. It can cause reduced growth and vigor of trees on any rootstock with a roappy appearance of the stems where the phloem tissue with the virus grows irregularly, producing pits in the wood. In addition, tristeza stem pitting can cause a reduction in fruit size and number. In many cases, the reduction in fruit size may make the fruit unmarketable.

The amount of stem pitting and fruit problems usually depends on the strain of the virus. Some strains affect sweet oranges more than grapefruit and vice versa. Some strains affect both equally. Exact figures on the reduction in fruit yield and size due to tristeza stem pitting is not readily available.

Trees with severe tristeza stem pitting are usually removed. CTV exists in most field isolates as a mixture of different virus types. Some work has shown that severe strains may be hidden within the mixtures.



A stem from the grapefruit plant above showing the internal symptoms of stem pitting of the wood.



Severe yellowing, leaf distortion and vein corking in Mexican lime due to a severe strain of CTV from the Dominican Republic. The strain was transmitted by a single brown citrus aphid from infected sweet orange plants. This strain is not in Florida and the photo was taken in quarantine at the USDA, ARS in Frederick, Md.



Severe stem pitting CTV. The photo shows the external symptom of an elongated pit.

Currently, there is no good quick detection method for stem pitting tristeza except biological indexing on susceptible plants. As we learn more about the mixture of tristeza strains and their composition, specific detection means will follow.

## **USE CERTIFIED BUDWOOD**

The use of clean certified budwood is the major control means. Aphid control in the field is not recommended; however, maintaining good aphid control in nurseries with systemic insecticides and keeping trees under screen will enhance the ability to keep CTV out of planting materials.

With the current shortage of citrus nursery trees, it is well advised that planting materials should be purchased from reputable Florida sources so that systemic diseases can be avoided.