Historical review on Citrus tristeza virus (CTV) in Palestine

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Historical review on *Citrus tristeza virus* (CTV) in Palestine

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Abstract. Citrus is an important crop in Palestine. Citrus groves are mainly concentrated in the West Bank and Gaza strip. Given the similar conditions of citrus industry across the Middle East area (Jordan and Israel), CTV is thought to have been introduced through infected plants imported from the neighbouring countries or through viruliferous aphids. Recent surveys have demonstrated that today CTV poses a major threat to the Palestinian citrus industry.

Keywords. Citrus – CTV – Palestine – West Bank.

Bref historique du virus de la tristeza des agrumes en Palestine

Résumé. *Les agrumes représentent une culture importante en Palestine. Les verges d'agrumes sont pour la plupart concentrés en Cisjordanie et dans la Bande de Gaza. Vue que l'agrumiculture présente des caractéristiques similaires dans toute la région du Moyen-Orient (Jordanie, Israël), fort probablement, le CTV a été introduit en Palestine à travers l'importation de plants infectés des pays voisins ou à travers des pucerons virulifères. Des enquêtes récentes ont démontré qu'actuellement, le CTV constitue une menace considérable pour l'agrumiculture palestinienne.*

Mots-clés. *Agrumes – CTV – Palestine – Cisjordanie.*

I – Introduction

Despite the small geographical area covered, Palestine is characterised by a great diversity in topography and altitude, as it occurs in the West bank, where the altitude ranges between 1020 meters above sea level in the mountains and 375 meters below sea level, in the Jordan valley. Such a variation makes it possible to cultivate fruit crops.

Fruit trees represent the main production in the West bank (106 thousand hectares). Citrus covers more than 7000 ha in the West bank and Gaza strip. It is widespread in the coastal area in Gaza, Qalqilia, Talkarem and Jericho thanks to the water availability and the suitable climate.

In 2005, the production was evaluated to 758 thousand Metric tons (PCBS 2004/2005) and the most famous varieties grown in the country are 'Shamouti', 'Fransawi', 'Dam Alzeghloul' sweet oranges, Palestinian sweet lime and local cultivar Youssef afandi.

This crop is facing serious problems such as the lack of water resources, marketing constraints, the tree age as well as the bad sanitary status of the plants; the latter is not completely unknown given the similarity with the citrus industry conditions in the neighbouring countries (Jordan, Israel), which have thoroughly been investigated.

II – Citrus tristeza virus

The first record of CTV in Palestine was officially reported by Jarrar *et al.* (2000); the infected trees were found in the Western West Bank at the Israeli border but no infection was assessed in the Eastern zone.

A total of 154 samples belonging to different varieties and species were collected from the Eastern and Western areas of the Palestinian West Bank. These samples were grafted onto sour orange, all the sources were maintained at the CIHEAM-MAIB lab facilities, and analysed by Direct tissue blot immunoassay (DTBIA) (Garnsey *et al.*, 1993).

These samples were also grafted onto Mexican lime and sweet orange and maintained in conditioned greenhouse as reported by Roistacher (1991). Later, observations were made also by electron microscopy on negatively stained grids of virus particles from concentrated partially purified extracts obtained through cortical scrapings of some samples as described by Milne, (1993).

Twenty-two samples out of 154 trees proved to be infected with CTV, and showed a clear-cut reaction on the nitrocellulose membrane. All CTV-infected samples were collected from the Western area of the West bank; sweet orange showed the highest level of infection followed by mandarins and lemons (Fig. 1).

The incidence of CTV infection in sweet orange indicated that 'Valencia' was the most infected variety in the area surveyed, followed by 'Shamouti' and 'W. navel', whereas the local orange ‘Fransawi’ was virtually free from CTV.

Three weeks after grafting, the new flushes of Mexican lime seedlings, inoculated with CTV-infected plants, displayed strong vein clearing and cupping of the leaves; 3 months later, stem pitting was observed in some Mexican limes, and, interestingly, also on sweet orange. In addition, CTV-like particles were observed under the electron microscope.

CTV was identified in the samples from Western West bank bordering Israel and none of the samples surveyed coming from Eastern West bank was found to be CTV positive, thus confirming the presence and distribution of this virus in the western area (Jarrar *et al.*, 2000). It is likely that CTV entered this area through infected plants imported from neighbouring countries or through viruliferous aphids or in both manners. Relatively to the Eastern zone, no data have been recently reported.

It is difficult to clearly determine the presence of CTV decline in the field and as most of the Palestinian citrus industry is on sour orange rootstocks, CTV represents a serious threat.

At present, no legislation has been issued for the mandatory control of citrus tristeza virus and for the certification of citrus propagating material. Accordingly, an immediate mandatory eradication program is needed in view of the proposed establishment of a citrus certification program for Palestine.

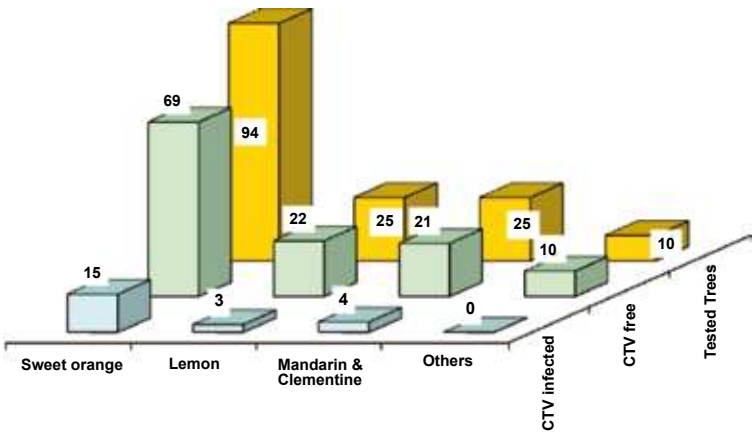

Figure 1. Distribution of CTV infected trees.

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