

Tristeza disease and its vectors in Israel: past and current status

Soroker V., Sadovsky A., Drishpon Y., Wise M.

in

D'Onghia A.M. (ed.), Djelouah K. (ed.), Roistacher C.N. (ed.).
Citrus tristeza virus and Toxoptera citricidus: a serious threat to the Mediterranean citrus industry

Bari : CIHEAM

Options Méditerranéennes : Série B. Etudes et Recherches; n. 65

2009

pages 129-130

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=801403>

To cite this article / Pour citer cet article

Soroker V., Sadovsky A., Drishpon Y., Wise M. **Tristeza disease and its vectors in Israel: past and current status**. In : D'Onghia A.M. (ed.), Djelouah K. (ed.), Roistacher C.N. (ed.). *Citrus tristeza virus and Toxoptera citricidus: a serious threat to the Mediterranean citrus industry*. Bari : CIHEAM, 2009. p. 129-130 (Options Méditerranéennes : Série B. Etudes et Recherches; n. 65)



<http://www.ciheam.org/>
<http://om.ciheam.org/>

Tristeza disease and its vectors in Israel: past and current status

Soroker V.¹, Sadovsky A.², Drishpon Y.³, Wise M.⁴

¹ Department of Entomology, Agricultural Research Organization, The Volcani Center, Israel

² Citriculture, Extension Services. Ministry of Agriculture, Israel

³ Department of Entomology, Agricultural Plant Protection, Extension Services. Ministry of Agriculture

⁴ Plant Protection and Inspection Services, Ministry of Agriculture, Israel

Abstract. The historical review of Citrus tristeza findings in Israel is reported since 1956, showing the first outbreaks in 1970 by *Aphis gossypii*. After the failure of the virus eradication programme, tolerant rootstocks were used for the disease control. Nowadays very few declining trees are reported and, apparently, *Toxoptera citricidus* is not present yet. A national regulation provides preventive measures (primarily the use of CTV-free propagating materials) for the control of citrus tristeza.

Keywords. *Aphis gossypii* – Citrus – CTV – Israel – *Toxoptera citricidus*.

La Tristeza et ses vecteurs en Israël: passé et état actuel

Résumé. Une illustration des données historiques de la tristeza des agrumes en Israël à partir de 1956 est rapporté, ceci en décrivant les premiers foyers qui ont été signalés en 1970 et qui étaient associés à la présence de l'*Aphis gossypii*. Après l'échec du programme d'éradication du virus, des porte-greffes tolérants ont été utilisés pour lutter contre cette maladie. A l'heure actuelle, on ne signale que quelques arbres en dépérissement et, apparemment, le *Toxoptera citricidus* n'est pas encore présent. La réglementation nationale prévoit des mesures préventives (en premier lieu, l'utilisation du matériel de multiplication indemne de CTV) pour combattre la tristeza des agrumes.

Mots-clés. *Aphis gossypii* – Agrumes – CTV – Israël – *Toxoptera citricidus*.

I – Introduction

Currently, citrus cultivation in Israel is spreading over about 17,500 ha and some additional 2000 ha are planted annually in the country. A wide variety of sweet oranges, grapefruits and lemons, as well as a variety of more exotic citrus fruit are being cultivated; Israel's major citrus product by volume is the traditional Shamouti orange.

II – Historical review of CTV and its vectors in Israel

1956. Tristeza disease, caused by citrus tristeza virus (CTV), was first detected in Israel in 1956 in Meyer lemon and later in some other varieties. The infected trees were eradicated.

1970. *Aphis spiraeicola* was introduced into Israel in the late 1960s. Natural spread of CTV was noted in 1970. An eradication project was set up.

1963 - 1978. An aphid extensive survey in citrus groves of Israel was conducted with the main task to detect the major CTV vector *Toxoptera citricidus*. This aphid was not found (Swirski and Amitai, 1999). Other aphids found to be potential vectors were *A. spiraeicola*, *A. gossypii* and *T. aurantii*. *A. gossypii* was imputed to transmit some strains of CTV in Israel (Racah *et al.*, 1976).

1986 - 1987. A CTV survey conducted in these years indicated that the eradication project conducted for a period of 16 years had been only partially effective. CTV infestation in the main orange-growing areas, in the coastal plain of the country was found high and widely spread and could no longer be contained by eradication (Lobenstein, 1993). The management efforts were directed to reduce tristeza-induced damages by uprooting the infested trees and by grafting scions onto rootstocks tolerant to CTV. The approach of CTV tolerant rootstocks did not prove valid, since the resistant rootstocks suffered from low water quality, were susceptible to other diseases and some produced lower yield and fruit quality.

Present status. The occurrence of CTV varies considerably. In the Coastal Plain, most of the infected trees that are 7 years old or older are symptomless and only a few cases of rapid decline were reported. In the south and northern parts of the country outbreaks of CTV are not common. No systematic surveys on CTV spread were conducted in the last decade. Moreover, the Israeli growers are well aware of the problem and suspicious plant material is brought for diagnosis at the laboratories of Plant Protection and Inspection Services (PPIS).

A. spiraecola that was introduced into Israel in the late 1960s is not considered an efficient vector, but its population may reach high rates which in turn accelerate CTV spread. *T. aurantii* failed to transmit CTV in Israel.

In the last years no vector survey has been conducted; however, since it was not recovered in the routine orchard inspection and monitoring by the extension service and PPIS, we assume that *T. citricidus* is not present in Israel.

Management of tristeza today is largely based on preventive measures, quarantine control which includes heat treatment and shoot-tip-grafting, production of tristeza-free propagation material at all production stages and on-site inspection. The official regulations of PPIS for the prevention of CTV spread include:

- i. maintenance of all propagation material under insect-proof screenhouse;
- ii. germplasm stock tested for CTV one by one twice a year by ELISA following ISO17025 protocol, using CTV reagents from BIOREBA, Switzerland, once every four years the infestation is verified through bioassay-indicators using Key lime.
- iii. foundation stocks tested for CTV once a year at random or by suspect.
- iiii. sampling in the nursery once a year before marketing; the sample size depends on the frequency of CTV past events. The infected plants (currently about 1 in 1000) are immediately eradicated. Only certified CTV-free plants are allowed to be planted.

References

- Loebenstein G., 1993.** Viral, viroid and spiroplasma diseases of citrus. In: Plant Virology. Principles and Application. (Hebrew). Dept of Scientific Publications, *Agricultural Research Organization, The Volcani Center*: 194-205.
- Racah B., Loebenstein G., Bar-Joseph M., 1976.** Transmission of *Citrus tristeza virus* by the melon aphid, *Phytopathology* 66: 1102-1104.
- Swirski E., Amitai S., 1999.** Annotated list of aphids (Aphidoidea) in Israel. *Israeli Journal of Entomology* 33: 1-120.