Historical review of Citrus tristeza virus (CTV) in Algeria

Larbi D., Ghezli C., Djelouah K.

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 107-110

Historical review of *Citrus tristeza virus* (CTV) in Algeria

Larbi D.[1], Ghezli C.[2], Djelouah K.[3]

[1] University of Skikda, Algeria
[2] Institut Technique de l'Arboriculture Fruitière et de la Vigne (ITAFV) Boufarik, Algeria
[3] CIHEAM - Mediterranean Agronomic Institute, Valenzano (BA), Italy

Abstract. Since the early cases of tristeza disease reported in the Algerian citrus orchards, probably introduced with infected budwood from abroad, the disease has never shown particular problems for the local citriculture. In the past, the disease was monitored only based on symptoms observations. Recently, the use of biological indexing and serological assays have contributed to detecting other CTV infected trees. Management policy and strategies for disease control and quarantine were undertaken in order to avoid the introduction or spread of the disease in citrus orchards.

Keywords. Algeria – Citrus – Satsuma – Tristeza.

Aperçu historique du virus de la tristeza des agrumes en Algérie

Résumé. *Depuis la détection des premiers cas d'infection par la tristeza en Algérie, probablement causés par l'introduction de matériel de multiplication infecté de l'étranger, la maladie n'a pas posé de problèmes majeurs pour l'agrumiculture locale. Par le passé, la tristeza faisait l'objet d'un suivi exclusivement basé sur l'observation des symptômes. Récemment, l'utilisation de l'indexage biologique et des techniques sérologiques a contribué à déceler d'autres arbres infectés par le CTV. Des politiques et des stratégies de gestion et lutte et des mesures de quarantaine ont été adoptée afin d'éviter l'introduction et la diffusion de cette maladie dans les vergers agrumicoles.*

Mots-clés. *Algérie – Agrumes – Satsuma – Tristeza.*

I – Introduction

For centuries, citriculture has been considered as the most important fruit crop sector in Algeria and part of its traditional agriculture. Before the French colonisation (1830), more than 22 000 citrus trees, mainly orange trees, were already grown in the Mitidja area.

Until the end of the 2nd world war, the Algerian citriculture was considered as one of the most important in the Mediterranean basin and showed fluctuations in production, with a positive peak in 1950 (Rebours, 1950).

At that time, mother blocks were already established by the growers and the relative trees were subjected to varietal and sanitary assessment ensuring the trueness-to-type of the selected clones and the absence of virus and virus-like pathogens (Rebours, 1950).

Unfortunately, due to an inadequate reorganization in the 1970s, the cultivated area and the citrus production have considerably decreased over the last twenty-five years from 450,000 tonnes (1974) to less than 250,000 tonnes (2000).

Algeria has always been aware of the problems of virus diseases that damage the citrus orchards, adopting a continuous monitoring of the propagative material of the different nurseries and the use of resistant and tolerant rootstocks (Taleb, 1974).

Currently, citrus orchards cover an area of 45,040 ha, or 0.6% of the agricultural land. This crop is located along the coastal zones mostly concentrated in the Mitidja area (44%). The production is intended for local consumption; the citrus orchards are mostly of the major orange and mandarin varieties, while most plantations are grafted onto sour orange.

The biggest mother block is situated in the Beni Tamou farm Institut Technique d'Arboriculture Fruitiére (ITAF) which was created during the 80s from plant material of the ITAF Boufarik which has a collection of 256 varieties and clones. Regional mother blocks are also available introduced by the French from the INRA Corsican station (ITAF, 2003).

Particular emphasis was given to the sanitary status of the propagated citrus varieties in Algeria; the decline of this crop in Algeria was the result of several constraints including the aging of the orchard, the low turnover rate of plantations, inadequate care of the crop, water stress observed over the past decade and poor health status (Bové, 1995). About the health status, many fungal, bacterial, virus or mycoplasma diseases, which have led to a decline in quality and quantity, were reported.

For over 40 years, the existence of viral diseases was and still is among the factors which have promoted the decline of this crop in Algeria (Bové, 1995).

The first virological control of the mother block was made at the time of its establishment by the *Institut Technique d'Arboriculture Fruitière* (ITAF) in conjunction with the French research center (CIRAD).

II – CTV situation

Since 1948, quick decline probably associated to the CTV has been reported in some commercial groves; particular attention was given to these declining trees.

It seems that all the early cases of tristeza found in the citrus-growing areas of the Mediterranean Basin can be traced back to the introduction of infected budwood from abroad. All countries included Algeria, which have introduced the Meyer lemon variety, have also introduced tristeza (Bové, 1966).

In fact, between 1955 and 1957, a number of Meyer lemon trees in Algeria were carrying *Citrus tristeza virus* (Frezal, 1957). No natural propagation of the disease was observed at that time, except for bud propagation. The eradication of Meyer lemon and the characteristics of the virus strain showed a low risk of spread of this disease.

Moreover, other varieties imported from Australia, South Africa, Japan and the United States of America have also been reported to have introduced tristeza into the Mediterranean countries (Bové, 1967) .

Later, Farraj and Omar (1969) suspected the presence of tristeza disease on 30 trees, which was confirmed later by the Mission COFROR in 1971 (Anonymous, 1971). During a technical visit to Algeria, French researchers found indications that tristeza virus is present in some citrus trees in the Mitidja area. The trees affected were two "Marsh" seedless grapefruits and two Salustiana oranges budded on sour orange, about 22 years old. The "Marsh" seedless grapefruit displayed a foliage of normal green colour, but with an overgrowth of the scion trunk and typical honeycombing below bud union. The "Salustiana" orange trees were stunted with twig dieback, trunk overgrowth above bud union and honey combing in the sour orange trunk (Bové, 1995) .

During a visit to a large state–owned citrus orchard in Massouma, 40 sweet orange trees probably of "Verna Pereta" were found showing dieback, leaf vein yellowing and wilting, while in some trees, honey combing was observed in the trunk. In the same orchard, about 500 m away, another

group of about ten declining trees of Clementine mandarin and Pereta orange, budded on sour orange rootstocks, were observed. All the trees were over 30 years old, some were dying and few were already dead. The cause of the abnormality was not determined, but it was suggested that ELISA should be used to index the trees.

In 1967, Bové, on a mission in Algeria, found tristeza in some trees of the varietal collection (Owari Satsuma, Tangerine) and some clementine trees belonging to the same collection of the experimental station of Boufarik.

The opinion was formulated on the fact that the disease is not spreading, while the Meyer lemon and Satsumas are not conducive to the dissemination of the infection source and are insufficient to allow diffusion with the vector *Aphis gossipii* (Taleb, 1974). During the 1970s on the request of the Algerian government, some visits and studies on the health status of citrus were also conducted by French experts who were familiar with the citrus situation in Algeria. Solutions and some recommendations were provided to better manage the situation; since then the plants have only worsened.

In 1982, the French expert Bové detected two trees showing CTV symptoms in the citrus varietal collection of Boufarik. These trees have been confirmed by biological indexing and destroyed; since then and till 2000, no symptoms of CTV have been observed in the citrus mother blocks and in the citrus orchards (ITAF 2003).

In 2001, ITAF reported again the presence of CTV in 11 mandarin and sweet orange trees belonging to the mother trees maintained on Beni Tamou farm. The positive trees were pulled out, strict and preventive measures were taken by national technical institutions and precautionary measures strengthened in the field (ITAF, 2003; EPPO, 2003).

III – Control

The complete elimination of Meyer lemon, the absence of the main vector *Toxoptera citricidus* and of natural transmission by other aphid species, have probably removed the risk of spreading the disease in Algeria. However, CTV was and still a major problem and a danger to this crop, mainly because surveys for this disease have never been performed in commercial orchards.

In the late 80s, the Centre National de Control et Ceritication (CNCC) and ITAF started to control the mother plants belonging to the multiplication plot; however, during the 90s and given the political situation prevailing in the country, the activities had been limited at all levels.

Since the introduction of *T. citricidus* in Portugal and the appeareance of new outbreak of tristeza in some other Mediterranean countries, Algeria has adopted a new technical guidance of its citrus fruit such as the selection of healthy local varieties, the importation of disease-free varieties and the adoption of new tristeza-tolerant rootstocks: Cleopatra mandarin, *Poncirus trifoliata*.

References

Anonymous 1971. Plan de renovation du verger Agrumicole algerien COFROR. *Ministère de l'Agriculture et de la réforme agraire*. Mission COFROR, IRFA, Paris (France).

Bové J.M. 1966. Citrus virus diseases in the Méditerranean area. *Proceedings of the meeting on phytiatrie and phytopharmacy*. Marseille 1965 (France).

Bové J.M. 1967. Maladies à virus des citrus dans les pays du Bassin Méditerranéen. *Fruits,* 22- (3): 125- 140.

Bové J.M. 1995. Virus and virus-like diseases of citrus in the Near East region. *FAO Rome eds*: 518 pp.

EPPO 2003. EPPO reporting service 2003-072, N°5, *European Plant Protection Organization* EPPO, Paris.

Farrag S.N., Omar M.A. 1969. The present status of citrus virus diseases in Algeria. *Agricult. Research review Dokhi*, Vol 47 n° 5 Sept.

ITAF 2003. Rapport sur le depistage du C*itrus tristeza closterovirus* (CTV) au niveau du parc à bois agrumicole. ITAFV, CNCC, INPV. Ministère de l'Agriculture, Alger 2003, Algérie.

Rebours H. 1950. Les agrumes. *Rapport de l'union des syndicats des producteurs d'agrumes en Algérie.* Alger.

Frezal P. 1957. La presence en Algérie de la tristeza et de la xyloporose des citrus. C.R. *Acad. Agric. France 1957.* Vol 43 N° 6: 353-356.

Taleb A. 1974. L'état sanitaire des agrumes en Algérie. Compte rendu de la réunion scientifique sur la selection sanitaire des agrumes. *Comité Maghrébin des agrumes et primeurs, Commission agro technique.* Alger 1971, Algérie.