The CIHEAM-Mediterranean Research Network on Certification of Citrus (MNCC): the regional programme for the control of Citrus tristeza virus and its major vector Toxoptera citricidus in the Mediterranean

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Introductory session

The CIHEAM-Mediterranean Research Network on Certification of Citrus (MNCC): the regional programme for the control of *Citrus tristeza virus* and its major vector *Toxoptera citricidus* in the Mediterranean

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Citrus tristeza virus (CTV) is present in most of the Mediterranean countries, usually inducing the 'quick decline' of all citrus spp. when grafted onto the sour orange rootstock, which is highly susceptible. Other exotic virus strains, CTV-stem pitting (CTV-SP) and CTV-seedling yellows (CTV-SY), are apparently not spread yet in the region. Apart from the use of CTV-infected material, this virus is transmitted in the Mediterranean by different aphid species, mainly by *Aphis gossypii*. In 2002 and 2003, *T. citricidus,* the most efficient virus vector, known as the brown citrus aphid (BrCA), was reported in Northern of Spain and Portugal, respectively. It was the first finding of BrCA in a Mediterranean country, which was officially reported in 2005.

The presence in Northern Portugal and Spain of *T. citricidus* represents a serious threat to the Mediterranean citrus industry since the virus inoculum is widely distributed in the whole region and the susceptible sour orange is the predominant rootstock. *T. citricidus* can tremendously enhance virus dissemination up to 100%, selecting the severe exotic virus strains (CTV-SP and CTV-SY), which have apparently a very limited presence in the region. These strains can not be controlled by the use of tolerant/resistant rootstocks (trifoliate orange and its hybrids), which are effective with the CTV-quick decline strain (CTV-QD).

Considering the socio-economic and environmental importance of citrus in the Mediterranean region, preventive measures should soon be applied (strict quarantine measures, virus and vector monitoring, elimination of infected plants, certification of propagating material), while the elimination of the severe virus strains and, eventually, the pre-immunization of nursery plants should be considered in case of failure. To this aim all Mediterranean countries must make efforts in spreading information and raising awareness on CTV and its main vector for a rapid and urgent application of all possible control measures. It is important to outline that the use of 'healthy' certified citrus propagating material is surely the first action for preventive or delaying virus/vector entrance and dissemination.

I – CIHEAM initiative

This situation prompted CIHEAM/Mediterranean Agronomic Institute of Bari to urgently promote a harmonized common action for the control of the virus and BrCA in the whole region in the framework of the activities of the Mediterranean Research Network on Certification of Citrus (MNCC). The research network was established in 1995 aimed at:

– raising awareness on the sanitary problems affecting citrus for preventing dissemination of harmful pathogens across the Mediterranean area;

– setting up, standardization, validation of technical protocols for pest monitoring and sanitary controls in certification before their application on a large scale in a specific country;

– updating information on the sanitary status of citrus trees in the Mediterranean countries;

– characterizing new citrus pathogens of Mediterranean importance;

– promoting the use of healthy citrus propagating material as an essential preventive measure for pathogen and pest control;

– disseminating information on EU regulations for achieving quality requirements through the certification programmes;

– supporting harmonized legislative instruments for the application of phytosanitary rules.

II – MNCC thematic workshops

The network promoted 3 thematic workshops on '*Citrus tristeza virus* and *Toxoptera citricidus*: development of management and control strategies in the Mediterranean region', which were organized with the collaboration of the Plant Protection institutions of the hosting country and FAO.

Apart from the representatives from CIHEAM and other international organizations (FAO, EPPO, GTZ), participants mostly from Phytosanitary or Plant Protection Services, scientific institutions of 22 countries mainly of the Mediterranean region attended the workshops; moreover, experts from the Mediterranean region and from USA highly contributed giving their technical support (Fig. 1,2).

The first thematic workshop was organized at Faro, Portugal (7-8 April, 2005), the country where BrCA was firstly reported and where control actions had to be urgently taken. In this workshop, a previous MNCC project proposal for the control of CTV in the Mediterranean region was revised on the basis of a new scenario given by the entrance of *T. citricidus* in the area.

After the workshop, a technical trip to Northern Portugal was organized for a small group of experts to visit the sites infested by BrCA. The area is too cold for commercial citrus growing; however, it is characterized by the abundance of backyard citrus in many of the houses in the cities and countryside.

Following Faro recommendations, a second MNCC thematic workshop was organized in the same year in Cairo, Egypt (22-23 September, 2005). A regional programme proposal was presented based on the most recent developed technical protocols for virus and vector monitoring and aimed at providing Mediterranean countries with harmonized regulations and procedures to be shortly adopted. This workshop was also devoted to spread information and raise awareness on these topics in Egypt as well as in the Near Eastern citrus-growing countries.

In the last thematic workshop in Adana, Turkey (8-10 June, 2006) the MNCC proposal of the regional programme for the mandatory control in the Mediterranean Region of *CTV* and its major vector *T. citricidus,* was finalized by MNCC representatives of 11 Mediterranean countries in addition to Sudan, under the coordination of CIHEAM/Mediterranean Agronomic Institute of Bari.

III – MNCC proposal of the regional programme for the mandatory control of *Citrus tristeza virus* and its major vector *Toxoptera citricidus* in the Mediterranean Region

The regional proposal developed and endorsed by MNCC country representatives will be presented to their governments in order to submit it to different donors as a priority issue for the Region. The proposal is structured as follows.

- an introductory part on the (i) importance of citriculture in the Mediterranean by the agricultural, economic, social and environmental point of view; (ii) severe citrus deterioration caused by CTV; (iii) the state of the art on CTV and its vectors; and (iv) the risk of a disaster by the dissemination of *T. citricidus* in the area;
- a justification that CTV is present as isolated foci or outbreaks in all Mediterranean citrus-growing countries and *T. citricidus* is now present in Portugal and Spain, thus seriously threatening the whole area;
- the objectives which are to provide the region with harmonized tools (useful information, technical protocols and regulations) for controlling CTV and preventing the introduction and dissemination of *T. citricidus*; the project will involve the national, regional and international organizations and institutions;
- the beneficiaries who are represented by all citrus stakeholders, primarily citrus farmers, nurserymen and Ministerial Plant Protection and Quarantine Services;
- the coordination of CIHEAM jointly with MNCC partners and with the collaboration of other organizations and donors;
- the facilities and equipments necessary to the implementation of the programme;
- the workplan which is focusing on the (i)enhancement of harmonized phytosanitary control measures and regulations (quarantine and certification); (ii)CTV monitoring and characterization; (iii)elimination of CTV-infected plants; (iv)monitoring aphid population and implementing efficient control measures; (v)raising awareness; (vi)strengthening of harmonized research and know-how; (vii)technology transfer and information exchange;
- the expected results.

In the meantime, posters and brochures in Arabic were also produced as information sheets for the identification of tristeza disease and its vectors. This material includes photos on the disease and on the vectors as well as on the control strategies based on virus and vector monitoring, elimination of virus foci and the mandatory use of certified propagating material mainly on tolerant rootstocks. The material produced has been widely distributed in different Mediterranean countries to support the extension programme. In Greece, Malta and Turkey these booklets and posters were also translated in the local language.

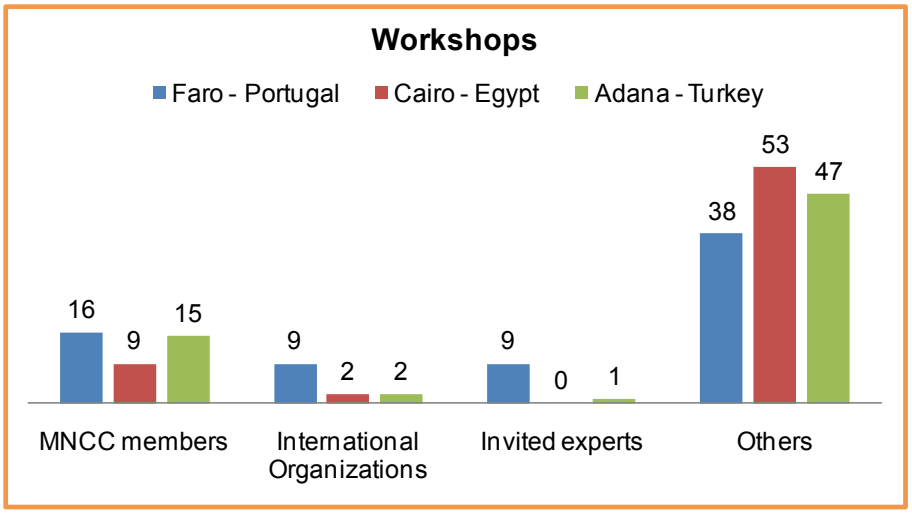

Figure 1. Participants to MNCC workshops.

Figure 2. Represented countries at the MNCC workshops.