

2.4 Management of Bemisia-phytovirus risk in protected crop in Mediterranean zone.

The context of this work is a phytosanitary crisis: the introduction/establishment in France of an insect of tropical origin, vector of very harmful phytoviruses for ornamental and horticultural crops associated to favourable geographic situation for bioinvasions. In 2002-2003, population outbreaks of the whitefly *Bemisia tabaci* on tomato in greenhouses of Roussillon and South-East basins associated with some spot of Tomato Yellow Leaf Curl (TYLC) disease have profoundly destabilized the entire production channel of tomato in France (Dalmon et al, 2003¹). In the socio-economic context of Rhône- Méditerranée basin, fresh tomato production (45% of national production) is mostly based on large vegetative cycle with varieties TYLC sensitive. The use of whitefly proof nets was the first prophylactic measure adopted to decrease the introduction frequency of *Bemisia* adults without excluding the others means of control (Fargues et al, 2004²). Because temperatures of June and July generate ideal conditions for introduction, establishment and extension of *Bemisia*-TYLC spots, the increasing occurrences of such hot wave, like observed in 2003, should question in the next future the sustainability of tomato crop productions in greenhouses in the Rhône-Méditerranée basin and principally in the Roussillon.

A chance to tackle the adaptability of vegetable productions facing bioinvasion risks depending on global change. In a context of internationalization of markets, the organoleptic qualities as well as sanitary status of fruits and vegetables, the environmental quality of crops, and the marking of fresh products, are nowadays considered as corner stone for developing such agricultural activities. This postulate is based on the considerations made by the professionals (ONIFLHOR) and incitation by customers around the theme "fresh product = health factor". At European level, policies are going the same way restricting very strongly the use of chemicals. Because of progress during the last 20 years in terms of Biological and Integrated Protection, especially on tomato crop, this objective seemed reachable (Van Lanteren, 2000³). But the introduction of whiteflies infested with viruses has "de facto" generated a phytosanitary crisis questioning all the knowledge by considerably lower the damage thresholds (Fargues et al, 2004).

The combination between this type of phytosanitary crisis and the global change should lead to a sound analysis of the development schemes for the fruit and vegetable channel with final objectives of product quality and marking. The actual crisis gives the opportunity to constitute an interactive scientific community capable 1) to analyse all the technical and organizational aspects facing with the management of major phytosanitary risks due to bioinvasions and 2) to anticipate and overcome global change impacts.

In this case study application all the most recent knowledge of scientific teams involved in the ANR - ADD *Bemisia*Risk project (2007-2009) would be brought together. The aim of the ADD project was the acquisition of a coherent corpus of knowledge integrating biotechnical and socio-economic components on the problematic of emergent risk in the plant production area.

The expected outputs would be

1) To focus on the emerging disease and new bioinvasion problematics on detection, evaluation and risk management at territory level.

¹ Dalmon A., Cailly M., Dufour O., Gros C., Cailly A., Peterschmitt M. 2003. Emergence de virus transmis par aleurodes dans les cultures de tomate en France. *Actes Coll. Intern. Tomate sous abri: protection intégrée, production biologique*, 24-29.

² Fargues J., Bonato O., Albajes. R. 2004. Gestion du risqué *Bemisia* en culture de tomate sous abri: les strategies. *PHM- Revue Horticole*, 461: 28-31.

³ Van Lanteren J.C. 2000. A green without pesticides: fact or fantasy? *Crop Protection*, 19:375-384.

- 2) To open new perspectives in plant epidemiology: a multi-disciplinary approach with integration and interaction instead of a mono-disciplinary approach usually developed.
- 3) To answer about the sustainable development of regional vegetable productions in a context very sensible to global change effects.

