

Current status of the whitefly *Bemisia tabaci* as an introduced pest in Brazil

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INTRODUCTION

Since it was first described, the tobacco whitefly (*Bemisia tabaci*) has become one of the most important agricultural pests in subtropical and tropical areas worldwide. In the last twenty years, probably owing to international trade and accidental human-assisted introduction, this notorious pest has continued to expand its range and, consequently, its status as an agricultural pest has become greatly aggravated (Oliveira *et al.*, 2001).

Tobacco whitefly is highly polyphagous, having been recorded on many herbaceous and annual plants, including crops and weeds. The ease with which this insect changes from host to host and acclimatizes to different regions of the world may have contributed to the wide range of intraspecific variations in its pseudo-pupal characters, leading to 22 synonymies (Mound & Halsey, 1978) and six population groups (De Barro *et al.*, 2004).

In the 1980s, increases in field populations of tobacco whitefly in Hawaii, Puerto Rico and the USA resulted in plant disorders of unknown etiology. In Brazil, mock tomato (*Solanum gilo*) and okra (*Abelmoschus esculentus*) crops heavily infested by the B biotype (which showed evidence of blanching and woody fruits, respectively) became inedible and were rejected by consumers. These symptoms have not been reported previously.

CURRENT STATUS IN BRAZIL

Tobacco whitefly (as the cotton strain or A biotype) was introduced into Brazil in 1928 (Bondar, 1928), where it was considered an occasional pest and a vector of phytoviruses in beans, soybeans and tomato. However, with the introduction of the B biotype in the early 1990s (probably through the international trade of ornamentals), problems with this insect became huge.

The molecular method RAPD-PCR has shown specific DNA profiles for both native and introduced biotypes, and has further shown that spread of the pest was rapid. Tobacco whitefly is now established in 23 out of 26 states, as well as in the Federal District. Further, it has been found infesting a number of previously unreported crops and weeds (Oliveira *et al.*, 2000; Lima *et al.*, 2000; Lima *et al.*, 2002).

Crop production in Brazil has probably been seriously affected by tobacco whitefly. This includes production of beans, cabbage, cotton, melon, okra, tomato and water melon, and several other crops. To date, accumulated losses have exceeded 7 billion US\$. Insecticides have been used weekly to control populations in some areas and on some crops,

New weed hosts have also been colonized, and this has helped to increase whitefly populations. Such weeds include: *Borreria verticillata* (Rubiaceae), *Cleome espinosa* (Cleomaceae), *Herisanthia hemoralis* (Malvaceae), *Senna obtusifolia* (Leguminosae) and *Stachytarpheta sanguinea* (Verbenaceae) (Oliveira *et al.*, 2000); *Diodia teres* (Rubiaceae), *Herissantia crispera* & *Pavonia cancellata* (Malvaceae), *Ipomoea grandiflora* (Convolvulaceae), *Phyllanthus tenellus* (Euphorbiaceae) and *Solanum ambrosiacum* (Solanaceae) (Vasconcelos *et al.*, 1999).

The global distribution of whitefly-transmitted (WFT) geminiviruses is closely related to the pantropical dissemination of their polyphagous whitefly vector complex (Morales & Anderson, 2001). In Brazil, the crops most affected are tomatoes and beans. Although no real economic estimates of losses have been made, the tomato industry (especially in the north-east of the country), has suffered considerably as a result of infestations by the B biotype; in the last 4 years, more than 11,000 jobs have been lost because (amongst other factors) of the WFT geminivirus (Oliveira & Faria, 2000). The area cultivated with common beans is over 9 million ha, with Brazil producing over 50% of the total crop harvested. In these regions, bean golden mosaic virus (BGMV) is now considered the most limiting pathogen of this crop, where over 1 million hectares traditionally planted to beans have been abandoned owing to the presence of WFT geminivirus (Morales & Anderson, 2001).

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