

## PESTICIDE-FREE PRODUCTION OF GREENHOUSE VEGETABLE CROPS USING BENEFICIAL INSECTS AND BANKER PLANTS

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Greenhouse production of vegetable crops in the USA and throughout much of the world has relied heavily on chemical insecticides to control arthropod pests in the past. Due to the constant application of certain insecticides under protected agriculture conditions, it is feared that insect resistance has occurred, especially with *Bemisi tabaci* (Gennadius) (Hemiptera: Aleyrodidae) biotype 'Q'. Consumer food safety concerns over chemical residues have furthered the advancement of alternative pest control measures. Arthropod pests are controlled solely with IPM and beneficial insects, including the banker plant inoculation method at the University of Florida Protected Agriculture Greenhouse Project (UFPAP), USA. Most common pests in vegetable crops produced in Florida include: two-spotted spider mites (TSSM), thrips, aphids, broadmites, and whitefly. Beneficial insects include: parasitic wasps for aphids and whitefly, predatory mites for TSSM and broadmites, and generalist predators such as *Orius* sp. (Hemiptera: Anthocoridae) for control of many pests including thrips. The use of banker plants in recent years has led to new research where the parasitic wasp *Encarsia sophia* (Girault & Dodd) (Hymenoptera: Aphelinidae) is reared on hosting papaya whitefly, *Trialeurodes variabilis* (Quaintance) (Hemiptera: Aleyrodidae), providing control over *B. tabaci* in greenhouse tomato, pepper and melon. A current overview of successful IPM methodology used in the UFPAP greenhouse is an important part of teaching growers on how to use the system. Using IPM techniques, including banker plants, will reduce costs to the grower for purchasing un-needed beneficials, increase potential for new industry to raise banker plants, reduce and potentially eliminate chemical applications increasing worker safety, avoid re-entry delays and ultimately produce a pesticide-free commodity.

### EFFECTS OF MODERN INSECTICIDES IN THE VERY SENSITIVE PARASITOID *PSYTTALIA CONCOLOR* (SZÉP.) (BRACONIDAE) AND THREE SELECTED NATURAL ENEMIES OF IMPORTANCE IN HORTICULTURAL CROPS: THE PARASITOID *APHIDIUS ERVI* (HALIDAY) (APHIDIIDAE) AND *ERETMOCERUS MUNDUS* (MERCET) (APHELINIDAE) AND THE PREDATOR *CHRYSOPERLA CARNEA* (STEPHENS) (CHRYSOPIDAE)

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