# Conservation of Natural Enemies for Management of *Bemisia tabaci*

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*Bemisia tabaci* (Biotype B) is a key pest of cotton and other field and horticultural crops in the southwestern USA where it causes numerous yield and quality issues through feeding, honeydew deposition and vectoring of viruses. We have shown that natural enemies, particularly native generalist arthropod predators, inflict high levels of mortality on this pest in multiple crops and non-crop hosts and that predation is a key factor in governing the population dynamics of *B. tabaci* in crops such as cotton. Outbreaks of *B. tabaci* in cotton can be easily precipitated by the inappropriate use of broad-spectrum insecticides, further demonstrating the key role of natural enemies in pest population suppression. Over the past 15 years, we have developed and refined an IPM system for *B. tabaci* and other key pests of cotton that has as its center the conservation of natural enemies and maximization of their biological control service. The fundamental components of our integrated control program include a rapid and accurate monitoring program coupled with robust economic thresholds and highly selective insecticides that are used only as needed to supplement biological control. The mechanisms underlying the success of our approach have been elucidated through the construction and analysis of detailed, field-based life table studies. The deployment of selective insecticides, when needed, functions to both supplement control of *B. tabaci* while also preserving biological control function that in concert with other natural control forces provides for long term pest suppression. This “bioresidual” is the key mechanism underlying the success of our IPM program. Our IPM program has been widely adopted and implemented and has contributed to unprecedented reductions in the use of all insecticides for cotton pest management in our region. Since 1996, when the program was introduced, insecticide use has dropped nearly 90% and producers have enjoyed over US$210 million in savings from pest loss and insecticide costs. Over the past several years no insecticides have been applied by about 25% of producers in the region; in 2010, 29% of growers did not spray. Our management system provides a rare, validated example of integrated control, a concept elucidated by Stern and colleagues over 50 years ago [Stern, V.M., Smith, R.F., van den Bosch, R., Hagen, K.S., 1959. The integrated control concept. Hilgardia 29, 81–101], in which biological and chemical control act in concert to effectively and efficiently manage pest populations.

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