

**A NEW APPROACH TO EVALUATE  
AUGMENTATIVE BIOLOGICAL CONTROL  
AGENTS**

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**Abstract**

In this study we describe a novel predator immunomarking technique that compliments an existing predator gut content enzyme linked immunosorbent assay (ELISA) for detecting silverleaf whitefly, *Bemisia argentifolii*, prey remains. We marked commercially-purchased lady beetles, *Hippodamia convergens*, with either rabbit immunoglobulin G (IgG) or chicken IgG solution. The beetles marked with rabbit IgG were then released into a cotton field and those marked with chicken IgG were released into an adjacent cantaloupe field. The beetles were then recaptured with a vacuum collector 3, 7, and 14 days after release. We concurrently ran three ELISAs on each individual beetle collected. The first two ELISAs were run using commonly available anti-rabbit or anti-chicken antibodies to detect the presence of the immunomarkers. A third ELISA was run using an anti-whitefly egg specific monoclonal antibody for the presence of whitefly in the gut.

The proportion of augmented beetles containing whitefly prey remains was always higher than the proportion of native beetles containing whitefly prey remains. Additionally, the proportion of beetles preying on whitefly eggs was about the same whether they were foraging in cotton, where whitefly egg densities were very low, or foraging in melon, where whitefly egg densities were very high.

The whitefly egg-specific MAb was an excellent tool for evaluating predator feeding behavior of native and augmented predator populations and the novel immunomarking technique was very useful for studying both the intercrop movement of a predaceous natural enemy and differentiating between native and released predator populations. The combination of these techniques facilitated quality control monitoring of commercially purchased predators for augmentative biological control.