

Canopy management of macadamia trees and understory plant diversification to reduce macadamia felted coccid (*Eriococcus ironsidei*) populations

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Preliminary observations suggest that macadamia tree canopy density plays an important role in *E. ironsidei* colonization and subsequent build-up of high population density. Combining canopy thinning and increasing nectar and pollen plant sources for beneficial insects in the understory may result in improved *E. ironsidei* suppression. We investigated the role of canopy modification and understory habitat in enhancing natural enemy effectiveness to reduce *E. ironsidei* populations. Plots with pruned trees plus wildflower beds resulted in 40% less *E. ironsidei* than the control plots, and the pruned-only plots had 15% less *E. ironsidei* numbers compared to the control plots. Greater abundance of natural enemies were observed in the modified plots than in the control plots. Predatory beetles were 60 % more abundant in the pruned trees plus wildflower beds than in the control plots, and in the pruned-only plots there were 50% more predatory beetles than in the control plots. *Encarsia lounsburyi*, a parasitic wasp that parasitizes *E. ironsidei*, was 20% more abundant in the pruned-only plots than in the other plots. Yield results showed an increase of up to 28 lbs wet-in-shell/tree in the modified plots compared with the control plots. Our results provide evidence that pruned macadamia trees and understory plant species diversification enhanced natural enemy populations, and may result in increased biological control of *E. ironsidei* in macadamia nut orchards.