

## ***Efficacy and Rearing of Lady Beetles for Controlling Landscape Pests***

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### ***Objectives of the original Project:***

- Develop efficient and economical methods for rearing *Hippodamia*, *Cryptolaemus*, and possibly other coccinellids.
- Document the rate at which commercially available *Hippodamia convergens* disperse when released on aphid and mealybug infested landscape plants.
- Determine whether any of the methods recommended by beetle distributors and pest managers are effective in reducing the dispersal of released *Hippodamia*.
- Compare dispersal rates between commercially-available and our insectary-reared lady beetles to determine whether reared species are less likely to disperse.
- Determine impact of pesticide residues of insecticidal soap, horticultural oil, and organophosphates on coccinellid releases.
- Produce written recommendations for effectively rearing and releasing *Hippodamia* and *Cryptolaemus* for landscape pest control and integrating releases with insecticide applications.

### ***Summary***

We successfully reared a complete generation of *Hippodamia convergens* from adult to adult on a diet of honey bee larvae, pollen and water. However, these beetles lay few eggs or none at all. We were

unable to stimulate ovary development with changes in daylength or photoperiod alone; however, removing beetles from aggregations apparently has some impact. Feeding beetles aphids will eventually stimulate ovary development. Because of the difficulty with laboratory rearing of ladybeetles and the success of our collected-beetle releases, we concentrated on evaluating releases of mountain collected beetles during the second year of the project.

Mark, release/recapture experiments with mountain-collected ladybeetles on potted roses infested with rose aphids (*Macrosiphum rosae*) and potted chrysanthemums infested with melon aphids (*Aphis gossypii*) indicated that most lady beetles leave plants within 1 or 2 days of release. Allowing beetles to fly and feed before releasing them or releasing laboratory reared beetles instead of aggregation-collected ones from cold storage did not reduce dispersal enough to suggested economic viability of such treatments. However, further research is required to confirm these results.

Despite the high level of dispersal, lady beetle releases in all trials against melon aphids or rose aphids significantly reduced aphid numbers compared to controls. A portion of the released lady beetles remained on infested plants apparently feeding on aphids until our final sample 3 days after release. These results suggest that lady beetle releases may be an effective control for aphids on small potted plants. However, it must be emphasized that these trials involved only potted plants and high rates of released lady beetles (approximately 40 beetles per plant). Results on landscape roses, conducted in spring 1994 have not been analyzed.

In studies looking at impact of dried pesticide residues on leaves, soaps and oils had no impact on adult coccinellids one hour after spraying. Pyrenone had little or no effect after one day. Malathion and carbaryl residues continued to kill lady beetles for 2-4 weeks after application, with some differences in susceptibility between *Hippodamia convergens* and *Cryptolaemus montrouzieri*.



A research article reporting on the results of this project has been accepted for publication in California Agriculture. Research is continuing to determine optimum rates and conditions for effective control of aphids with *Hippadamia convergens* releases.

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