

BIOCONTROL BEAT

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Insects — A Public Relations Challenge or Asset

Decorative plantscapes in buildings, shopping malls, conservatories and other public spaces represent a unique horticultural environment. The benefits of a biological control approach are that plants live longer and need replacement less often when not weakened by chemicals. Employees are happier and liability risks are reduced. As if this were not enough, there are also valuable public relations benefits from using this new "green" environmentally friendly technology.

In public gardens and conservatories that promote a biological program in their public education it is easy to explain release cards and materials. In offices and restaurants, on the other hand, managers often want to be low-profile even though materials and beneficials are not generally noticeable. Where suitable, an initial release of large numbers of beneficials to colonize the plantscape is followed up with monitoring and a number of smaller releases, as needed, to ensure long-term establishment of natural enemies. Most successful maintenance programs continue year-round with very small preventative releases every two to four weeks. Whether discreet or didactic, visitors appreciate plantscapes managed with fewer chemicals.



About Us & Our Newsletter:

Rincon-Vitova Insectaries, Inc. is the world's oldest free-enterprise insectary. Our mission is to promote the use of natural enemies as an alternative to toxic pesticides. The success of thousands of practitioners is a testimony to our know-how. We have new resources we want to share. To suggest a topic, contribute a technique, subscribe on-line, share this quarterly newsletter with a friend, register at our website rinconvitova.com.

Adapt Beneficial Releases to Site

With knowledge and observation of insect behavior, you can adapt releases to any situation. For example, since *Cryptolaemus*, the Mealybug Destroying Ladybug, is attracted to light and white clothing, releasing at night and wearing dark clothing makes it more likely that they will settle down. Use a small brush to place individuals on infested foliage. A spritz of watered down honey or our Insect Food on foliage should help them feel at home. Predatory mites benefit from a release station to colonize most foliage. Divide mites into small envelopes and staple to inner leaves. Post-it notes folded over small twigs can give beneficials a release platform in the foliage. www.rinconvitova.com/release.htm



Post-it makes release platform for predator mites.



Lift predator beetles, place on prey with narrow brush.



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Controlling Mealybug in Protected Settings

The most common species of mealybug in interiors and ornamental production is citrus mealybug. Other species are long-tailed, obscure, citrophilus, grape and root mealybug. They suck the sap, damaging foliage and produce honeydew, which supports the growth of unsightly mold on leaves, and draws ants. Inspect new growth and look for ants. Even a single larva or a scale tended by just a few ants is a potential hotspot of mealybug all along the ant trail.

Biological Controls

Mealybug Destroyer: The lady beetle *Cryptolaemus montrouzieri* is effective when mealybug numbers are high and conditions are warm and humid and days longer. Several releases may be necessary, particularly during winter. "Crypts" may be drawn to a strong light from a skylight or picture window. In such situations, release after dark so the beetles find food and get settled before the bright sun attracts them to the window. They are less effective on longtailed mealybug (*Pseudococcus longispinus*).



Cryptolaemus larva feeding on citrus mealybug.

Crypt larvae are covered with white waxy hairs and look like mealybug. www.rinconvitova.com/mealybug.htm

Green lacewing: Lacewing larvae eat mealybug of all species, especially long-tailed mealybug that are more widely distributed on plants. Being retiring, they are the predator of



Cryptolaemus adult

choice where you do not want the public to notice Crypts or where there is a bright light attracting Crypts away from foliage. Lacewing search well and waste no time killing their prey. Don't assume that the remains of a lacewing feast are alive! Mealybug exoskeletons are left behind and may need to be blown off of decorative plants. Lacewing eggs glued on cards are hung in foliage, every week or two. At least four steady releases are needed or until monitoring shows no more pests. Green lacewing larvae in paper honeycombs work faster because they are ready to feed on larger prey. Lacewing also eat aphid, whitefly, scale, caterpillars, spider mite and more.

Leptomastix: The tiny wasp *Leptomastix dactylopii* lays her eggs

in citrus mealybug nymphs and adults. She complements *Cryptolaemus* use for citrus mealybug. Correct pest identification is useful. Crypts or lacewing should be released reduce mealybug, followed by *Leptomastix*, for thorough low-density control. They prefer warm sunny humid environments. www.rinconvitova.com/leptomastix.htm

Pathogen: Safe sprays made with the fungus *Beauveria bassiana*, such as Botanigard, Mycotrol, or Naturalis, will reduce the population before release of beneficials.

Root Mealybug: Drench soil with beneficial nematodes such as *Heterorhabditis indica*, a *Beauveria* product (Botanigard), chitin digesting bacteria (RhizoBoost), or an essential oil product (GC3).

Other Measures

- Prune heavily infested branches.
- There are many safe baits to control ants, which protect mealybug from predators.
- Spot-treat with insecticidal soap. Clean houseplants with Dr Bronner's soap mixed with Hot Pepper Wax and rubbing alcohol. Avoid broad-spectrum toxic pesticides.
- Quarantine new plants or severely infested plants when possible. Sometimes moving indoor plants outdoors will eliminate mealybug.

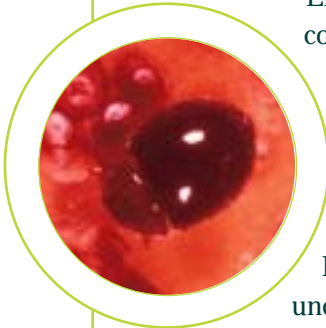
Friend Max Badgley — 1922-2006

Many treasured images of pests, predators and parasites in our archives (including those on this page) are a legacy of former Rincon-Vitova employee, Max Badgley. In the 1960's Max was on the team that developed mass-production systems for green lacewing and fly parasites. It was a pleasure to know and work with him. Photo of Max at UCR in 1969 courtesy of his daughter, Linda Scott, for a time employed with RVI.



SPOTLIGHT

A Reunion of Lindorus With Its Name



Lindorus lophanthæ is a black beetle with an orange colored head and thorax. Brought from Australia in the 1890's to control purple scale in citrus, adults are 2.5 mm long. A few years ago the University suggested we call it Rhyzobius and we went along even though most people in the field call it Lindorus. We recently hosted an entomologist from Australia who said it IS Lindorus. He should know since this ladybug hails from down under. We like calling it Lindorus again! (There is also a Rhyzobius that looks like Lindorus, but is not associated with California citrus red scale where we find our Lindorus.)



Lindorus lays eggs under armored scale covers and the developing larvae eat the scale. They move on to attack many more scale and are active at temperatures as low as 40° F and as high as 100oF. Honeydew from mature soft sticky scale is a barrier but Lindorus will eat the eggs and crawlers of soft as well as hard scale. Ten adult beetles per infested tree form a colony that will hit dense patches of hard scale. They are hard to find except for the distinctive way the scale is ripped apart. Good results have come from release programs for scale in pine trees, cycads, as well as various scale on indoor plants. Scale infestations are often caused by ant interference – see [rinconvitova.com bulletin_pest_ant](http://rinconvitova.com/bulletin_pest_ant).

A Knack for Biology

Professionals using Rincon-Vitova beneficials in public gardens are dedicated naturalists, with a strong desire to apply insect ecology and an enthusiasm for learning. Moody Gardens and Shangri-La were under biological programs when they opened. San Francisco International Airport and Dallas World Aquarium are newcomers while Foxwoods resort, Callaway Gardens' Butterfly Center, and North Carolina Zoological Park have had biological programs with us for many years.

Success starts with getting help to

identify pests. Using Intel Play QX3 child's digital microscope (developed with Mattel and sold for \$80 at www.playdigitalblue.com), digital photos can be emailed to entomologists or collaborators.



BioStart Microbials are Back — Streamlined Formulations with Microbe Food

Rincon-Vitova is pleased to announce that BioStart Rhizoboost and Defensor, shelf stable soil inoculants are in stock at our facility in Ventura.

BioStart Rhizoboost contains naturally occurring, beneficial microorganisms that increase biodiversity in the soil. At one quart/acre through the irrigation system it provides 250 billion viable microorganisms into the root zone. For best results, make four applications 7-10 days apart with food. Rhizoboost bacteria produce natural plant growth hormones (auxins, gibberellins and cytokinins). The mix of *Bacillus licheniformis*, *B. laterosporus*, and *B. chitinosporus* is associated with increased crop yields. The benefit is dramatic in fumigated or depleted soil. *B. chitinosporus* feeds on disease organisms. We see more root mass and fine root hairs and reduced nematode and disease problems.

The companion bacterial inoculant product, Biostart Defensor with *Bacillus subtilis* and *Bacillus cereus* is strongly antagonistic to plant disease. Drench the root zone or spray these bacterial strains to suppress botrytis, powdery mildew and other fungus diseases by their microbial competitiveness.

Apply both inoculants with Microbe Nutrients, an inexpensive mix of molasses, dextrose, yeast and humic acid that dissolves in water to flow through sprayer and irrigation equipment.

PRACTITIONER SPOTLIGHT

Inaba Vegetables Host Beneficials

Inaba Produce Farms has used sustainable practices since the original Inaba brothers came from Japan to Yakima Valley three generations ago. Beneficial releases are part of their current pest management program. One of the biggest challenges on the farm right now is the asparagus aphid—hard to treat in a 40 acre forest of 6 foot tall ferns. Lon Inaba is a good observer of nature on the farm. He comments, "If it had an easy solution more people would be trying to produce it, the challenges to figure out what's going on keep us from getting bored." Innovators like Lon collaborate with researchers to develop organic methods to solve pest problems.



Photo by Robert Hubner/Washington State Magazine

Lon Inaba and mother, Shiz, on a brief break at the packing shed



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HOT LINK: <http://ipm.ucdavis.edu/PCA/pestid.html>

For pest identification with great pictures, the UC-IPM Online Educational Resource "PCA Exam Helper" is in a class by itself. Recommendations for using beneficials are sometimes under-whelming. However, for online help to get to know the pest and potential natural enemies this site is a boost for problem solving with biocontrol. Find the same outstanding quality in UC-IPM's print publications.

HOT PUB: Among Reference Books—An Old Treasure

When we're looking up a pest, the first reach is often to E. O. Essig's *Insects of Western North America*, 1926, "A Manual and Textbook for Students...and a Handbook for... Entomologists and Agriculturists, as well as for Foresters, Farmers, Gardeners, Travelers, and Lovers of Nature." Used copies sell for under \$20. Insect identification resources are often regional. We are interested in where you turn for insect identification.



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