# ALTERNATIVES

# LACEWINGS, NATURE'S LITTLE HELPERS

BY REBECCA WILLIAMS

True to their name, lacewings have two pairs of wings "laced" with intricate veins. Though they look fragile and gentle, lacewings are avid predators. Known in their larval stage as "aphid lions," lacewings prey on many unwanted common yard and garden insects. 3.4 This article focuses on the green lacewing, *Chrysoperla carnea*.

# Lacewings are Beneficials

Beneficial insects are helpful to humans in many ways. They act as pollinators, and are natural enemies of insects and

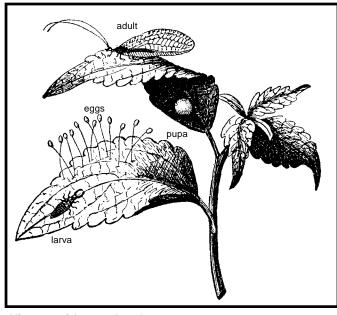
mites we think of as pests.<sup>5</sup> Development of pesticide resistance, pesticide-induced pest outbreaks, damage to nontarget organisms and negative effects on human health and the environment add to the increasing popularity of beneficial insects.<sup>6</sup>

# Biology

Understanding lacewing biology will help you attract and maintain healthy populations of these beneficial insects.

Lacewings pass through four developmental stages: egg, larva, pupa and adult. It takes a month or two for them to mature from egg to adult lacewing. The egg stage is several days to a week or two long, the larval stage about 14 to 28 days, and the pupal stage about two weeks to a month. <sup>7.8</sup> Fully mature adults live from

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Life stages of the green lacewing.

20 to 40 days.8

Lacewings lay their eggs on plant leaves and stems.<sup>5</sup> Green lacewing eggs are laid individually, supported by long filaments.<sup>7</sup> The eggs are pale green, turning gray before they hatch.<sup>9</sup>

Lacewing eggs hatch into flat, grayish brown alligator-shaped larvae. All larvae have a pair of tusks on the front of their heads. They use these tusks to pierce their prey, inject digestive enzymes and suck out body fluids. <sup>10,11</sup> Lacewings are highly predacious and cannibalistic as larvae. <sup>11,12</sup> They will eat the eggs and larvae of the Colorado potato beetle, most caterpillars, corn borers, spider mites, scales, psylla, mealybugs, whiteflies, thrips, leafhoppers, aphids and other soft bodied prey. <sup>10</sup> A single larva can consume up to 250 leafhopper nymphs, 300 to 400 aphids, 11,200 spider mites, 3,780 scales or 6,500 scale eggs. <sup>10</sup>

After 14 to 21 days of feeding, the larva weaves itself a silken cocoon. The cocoon is white and pearl-like. Lacewings pupate for up to two weeks in this

cocoon, depending on the temperature. 11

Lacewings then emerge as adults. Green lacewing adults are green or yellow-green, approximately 1/2-3/4" long with golden eyes and two pairs of intricately veined, translucent wings. 5 As adults, most lacewings feed solely on nectar, pollen and honeydew, while some are predatory. 7,8,13

# Habitat

Different lacewing species prefer different habitats. Some are more adapted to trees and shrubs, while others do better searching low, dense vegetation.<sup>13</sup>

Lacewings do well in an environment where the humidity is 30 percent or higher and the temperature is between 70 and 90 degrees. Like most beneficial insects, lacewings need food, shelter and water and enjoy a diversity of plant species. <sup>14</sup> Plants with very hairy or waxy leaves may inhibit lacewing larvae's ability to search for pest effectively. <sup>13</sup> Cover crops and low vegetation provide lacewings with overwintering sites. <sup>10</sup>

# How to Release Lacewings

Experiments in vineyards suggest that the best way to insure success with lacewings is to release them before pest populations peak. Very low pest populations as well as high populations are difficult for lacewings to control. <sup>15,16</sup> Monitor pests to know when to begin your release. <sup>9</sup> After release, continue to monitor both pest and lacewing populations. <sup>9</sup>

You can purchase lacewings as eggs, larvae or adults. Eggs are shipped in an inert medium such as rice hulls. <sup>10</sup> Larvae are shipped in individual compartments

to keep them from eating each other. Adults are shipped in a tube with netting on the ends.

Eggs are the most economical, but do not begin feeding immediately. Larvae have been the most effective in reducing pest populations in vineyard experiments. <sup>15</sup> Adults are nomadic and disperse well into trees and orchards. <sup>14</sup>

Keep purchased eggs between 80 and 90 degrees. This can be done by placing them in a cooler with a hot water bottle. Chilling lacewing eggs reduces the hatch rate. Once eggs begin hatching, sprinkle them near your pest infestation. It is a good idea to mist foliage with water before your release, 10 as lacewings thrive in high humidity. 6

Lacewing larvae can be gently tapped out of their packaging onto plants or placed individually on plants with a paint brush. If their shipping containers are opened and placed in the interior of the target plants, larvae will crawl from the packaging onto the plant.<sup>6</sup>

Several experiments indicate that effective control requires releasing relatively large numbers of larvae. Researchers have used up to between one and sixteen lacewing per plant. <sup>15-18</sup> You may need to do a follow-up release one or two weeks later. Continue to release lacewings until their populations are easily detectable or your pest populations decrease. <sup>2,9</sup>

# Attracting and Keeping Lacewings

Some of the lacewing's favorite flowers include safflower, <sup>19,20</sup> alfalfa, <sup>19</sup> borage, and lupine. <sup>21</sup> Growing these plants may entice lacewings into your yard or help them survive and reproduce.

Wheast is a commercially produced mixture of dried yeast and whey proteins. When mixed with water and sugar, Wheast can be sprayed around the garden to feed adult lacewings.<sup>22</sup>

### Conclusion

The lacewing is a voracious predator of many yard and garden pests and is excellent for pest management. This naturally occurring insect is a "little helper"

# DOES RESEARCH SHOW THAT LACEWINGS ARE EFFECTIVE PEST MANAGEMENT TOOLS?

Experimental studies of lacewing effectiveness, mostly on an agricultural scale, have produced varied results. While most studies show decreases, some dramatic, in the numbers of pests following release of lacewings, 6,17,18,23,24 others show mixed 15,16,25 or negative 6 results.

Research has demonstrated that

lacewings are effective predators for aphids on red peppers, <sup>18</sup> mites on apples, <sup>24</sup> and leafhoppers on grapes. <sup>16</sup>

Some research indicates that lacewings, especially older larvae, prey on other predatory insects as well as the pests they are supposed to control.<sup>26</sup> Careful monitoring is essential.

— Caroline Cox

# for successful biological pest control. \*

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