

### **Refrigerate on Arrival!**

Ladybugs are an excellent biological control for aphids. A single ladybug can eat up to 5,000 aphids; if you encourage your ladybugs to mate, each ladybug larva will eat about 400 aphids before pupating. While cold, ladybugs are dormant, so they are normally kept refrigerated. When you get your packages of ladybugs home, leave them in the refrigerator until you're ready to release them. Early evening is the best time to release them; this gives them all night to settle in, find water and food, and decide that they've found a good home.

We recommend that you force the ladybugs to stay in your yard when you first release them by temporarily "gluing" their wings shut with a sugar-water solution. Use half water, half sugared (not diet) soda pop, and spray the ladybugs from a clean spray bottle right in their bag as you're releasing them at the base of your aphid-infested plants. After a week or so, this "glue" will wear off and they'll be able to fly freely.

The ladybugs will probably be thirsty from their long hibernation, so make sure they have some moist places nearby to drink at. If it's dry, try misting some water around on your plants before releasing them. Later on, they'll get most of the moisture they need from your aphids and other pests.

Ladybugs will usually stick around while there are large pest populations to eat, during which time they'll mate and lay eggs. After the pests are not so readily available, they may fly away, but their eggs will hatch out and provide subsequent control.

Suggested release rates for ladybugs vary widely--from 1 gallon (72,000 bugs) for 10 acres, up to 3 gallons per acre. For home use, 1000 is usually more than ample for one application in a small greenhouse or garden. You can store them in the refrigerator and make weekly releases as needed. They will appear dead while refrigerated but will become active again as they warm up. Make sure your refrigerator is between 35° and 45° F. Too cold, and your ladybugs will freeze; too warm, and they'll start waking up. Ladybugs will normally survive 1-3 months of refrigeration. In early spring (through May), ladybugs last the least time, while mid-summer ones actually seem to benefit from some refrigeration. This is related to their life cycle; spring ladybugs have already been hibernating and living off their food stores, while mid-summer ones are young adults, and the refrigeration simulates winter for them. Obviously, some mortality can be expected the longer you store them.

Be careful to avoid using pesticides in your garden or greenhouse. Botanical pesticides like rotenone can be used up to a week before releasing the ladybugs; synthetic ones should be avoided for at least a month. And, of course, do not spray your garden after releasing the ladybugs. The only exception is soapy sprays, like Safer's -- these do not seem to bother the ladybugs. Make sure, however, that your soap spray has no additional pesticide ingredients.

If you are using your ladybugs indoors or in a greenhouse, you may want to screen off any openings before releasing them.

For ladybugs to mature and lay eggs, they need nectar and pollen sources as well as insects. In the wild, this is supplied by a wide range of flowering plants. Plants whose nectar and pollen is attractive to ladybugs include certain legumes (clover, alfalfa, peas, beans), aster family plants (such as sunflowers, zinnias, cosmos, coreopsis, and yarrow), and umbellifers (including dill, fennel, cilantro, and Queen Anne's lace).

If there are few nectar sources flowering in your yard, you may want to supply an artificial food source. (This is not required for current insect control, only to encourage the ladybugs to produce a new generation in your garden.) Mix a little honey with a small amount of water and a little bee pollen or brewer's yeast. Streak tiny amounts of this mixture on small pieces of waxed paper and hang the waxed paper around your plants. Replace every 5-6 days, or more often if they show signs of getting moldy. Refrigerate the unused food.

If your ladybugs do lay eggs, the eggs will look like a cluster of tiny orange footballs laid on edge. After hatching, the ladybug larvae look like little black "alligators" with orange (or white) spots. They are fast-moving and fast-growing, stuffing themselves on your aphids until they get about ½" long (in about 2-3 weeks). Then they pupate, usually at the top of a leaf, until ready to emerge as an adult ladybug.

Some people believe that ladybugs bring good luck. We hope they bring you good luck too!