

Description

Aphidoletes larvae are voracious native predators of over 60 species of aphids. Larvae are orange, legless maggots up to 1/16th inch long. Adults are small, delicate midges resembling mosquitoes. Adults are difficult to see as they are most active in the evening. They are frequently found hanging (unstuck) from spider webs where mating usually takes place.

Target Pest Aphids



Life Cycle

A complete life cycle takes 24 days at 70°F (21°C). Development rate depends on temperature and availability of prey.

- Sex ratio in populations vary, but there are usually more females.
- Female midges lay their eggs on leaves beside aphids. Each female lays 150-200 eggs during her 1–2 week lifespan. The eggs are shiny orange ovals, less than .3mm long.
- At 70°F eggs hatch in 2-3 days and the tiny larvae crawl along the leaf in search of aphids.
- Larvae feed by biting aphids and paralyzing them with a toxin before sucking out the aphid body fluids. They feed for 7-10 days and can kill up to 50 aphids per day. Where aphid populations are high, larvae kill many more aphids than they can consume.
- To pupate larvae drop to the ground and burrow into the top ½" of soil or organic material to spin a cocoon. Adults emerge in 2-3 weeks.
- In the Fall, if outdoors, the last generation of *Aphidoletes* will over-winter in the soil in cocoons. They are very hardy and survive outside throughout the growing regions of Canada, re-emerging in the Spring as adults to continue aphid control.

Note! *Aphidoletes* respond to cool temperature and shortening day lengths (less than 16 hours) by entering diapause (like a hibernation state). Therefore, in most greenhouses they are only active from March to September unless supplemental lighting is used. It has been found that leaving on one 60-watt bulb all night will prevent diapause in more than half of the larvae within a 20yd diameter circle, if night temperature are above 60°F.

Use in Biological Control

Aphidoletes are used to control aphids indoors in commercial greenhouses, interior platescapes, outdoors in orchards, shade trees, roses, and home gardens. Optimum conditions are 70-77°F (21-25°C) and high relative humidity (over 70%), particularly for the pupal stage, which must not dry out. If aphids are present in outdoor plants in late summer, a release of *Aphidoletes* in early Fall helps reduce the overwintering aphid population, while establishing the predator for early spring aphid control.



Monitoring Tips

Using 10-15 X hand lens, full-grown larvae are relatively easy to see among the aphids because of their characteristic orange color. Younger larvae are much smaller and pale in color, making them very difficult to see.

Product Information

Note! It is critical to keep the vermiculite or sand moist or the *Aphidoletes* will not emerge. Add a small amount of water if the media has dried out. *Aphidoletes* are sent as pupae (cocoons) in moist vermiculite or sand. Adults should begin to emerge within 1 week and all should emerge within 14 days of receipt. If adults do not emerge



add a small amount of water to the media and keep the container closed to raise humidity. The predators may be released in either of two ways:

- Hold closed containers in a warm place at 72-77°F (22-25°C)—warmth speeds up emergence—until many adults are seen flying in the container, then place the opened container near the aphid infestation in a shaded area.
- For use in a heated greenhouse or plantscape area, cut off one corner of the plastic container so that there is a small opening of approximately 1/2-inch. Place the container in the release area out of direct sunlight.

Introduction Rates

Note! Recent research has indicated that in greenhouses low-level weekly releases at rates of .05/ft² will prevent the build-up of most species of aphids. Releasing every two weeks is recommended.

Preventive Rate .05/ft² or 50 for 1,000 ft²
Rate with aphids present .1/ ft² or 100 for 1,000 ft²

Generally, *Aphidoletes* should be released in the spring before the first sign of aphid infestations and again once aphids are detected. Additional releases should be made 2 or 3 times at 7–10 day intervals in the aphid areas to establish the predator.

In Greenhouse Crops

In crops where aphids have been a problem in the past, preventive releases every two weeks at a rate of .05/ft² will help maintain control. For preventive releases, use 2 release points/acre and release in areas where aphids have *not* established. Do not release directly under circulation fans. Once aphids are detected use the following rates in the infested areas:

- Tomato 100 *Aphidoletes*/infested plant, weekly for 3 weeks
- Pepper 100 Aphidoletes/infested plant, weekly or until established
- Cucumber 10 Aphidoletes/plant, weekly in infested areas only until established
- Flower & Ornamentals Release at .1/ft² weekly, or every two weeks, or release 100-1000 *Aphidoletes* in hot spot areas.



Outdoor Use

For outdoor use, keep the *Aphidoletes* in a warm spot 72-77°F (22-25°C) until all have emerged, and then release during the evening on the upwind side of the planting so that the prevailing winds will help to disperse the midges throughout the plot. Use the following rates in the infested areas:

- Gardens 250 *Aphidoletes*/aphid hot spot, weekly for 2 weeks
- Orchards 5-10 *Aphidoletes*/tree, weekly for 3 weeks
- Shade trees 5-10 *Aphidoletes*/tree, weekly for 3 weeks
- Roses 3-5 *Aphidoletes*/plant, weekly for 3 weeks
- For large areas such as apple orchards, use 1,000-4,000 *Aphidoletes*/acre (5,000-10,000/ha), repeated 1-3 times, 1-2 weeks apart, or until established.



For Best Results

Use preventively before aphids appear. This will reduce aphid hot spots from developing into problem areas. When aphids are found, continue to make preventive releases **away** from aphid infested areas so the *Aphidoletes* can find any new infested areas. Make additional weekly *Aphidoletes* releases at rates of 100/plant or 1,000/hot spot until control is achieved.

The larvae need to burrow into damp soil, peat moss, sawdust or other growth media to pupate. In greenhouses with bare plastic or concrete floors, survival will be low unless such organic materials are provided. Adding a very thin layer (1/8 inch) of sand, sawdust, or other organic materials under the leaf zones of plants will improve cycling of *Aphidoletes*.

For control of cotton/melon aphid, which reproduces very quickly, *Aphidoletes* should be used along with *Aphidius* parasitic wasps and lacewing larvae.

It may be necessary to control ants in conservatories and around outdoor trees (use ant bait) because they can protect aphid colonies by removing predator larvae.

Using Chemicals

For effects of specific pesticides on *Aphidoletes*, contact Sound Horticulture for information. Insecticidal soaps are harmful to all stages of *Aphidoletes* but have no residual effect so can be used to reduce the number of aphids in hot spots. Strong sprays of water alone will dislodge aphids from plants and reduce numbers surviving in hot spots.

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