

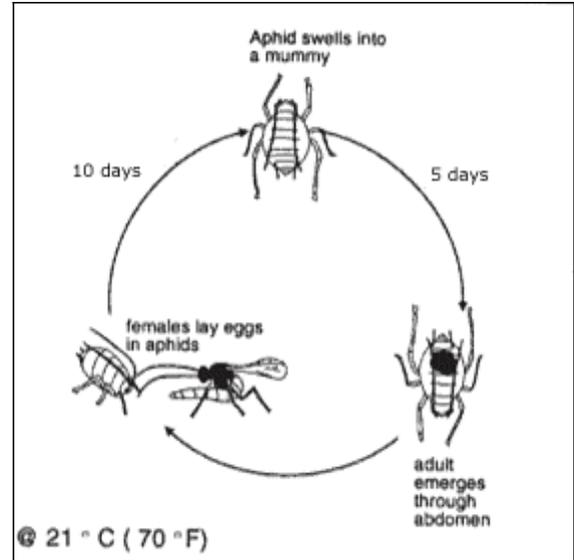
## Aphidius (*Aphidius matricariae*, *A. colemani*, *A. ervi*) Aphid Parasites

### Target pests

***Aphidius matricariae***: Green peach aphid (*Myzus persicae*) & related aphids.

***Aphidius colemani***: Melon aphid (*Aphis gossypii*)

***Aphidius irvi***: Potato aphid (*Macrosiphum euphorbiae*)



### Description

'Aphidius' species are a group of native parasitic wasps, frequently found parasitizing aphids in greenhouses and outdoor crops.

- Adults are tiny, dark coloured, non-stinging wasps, up to 2-3 mm (1/8 inch) long.
- Larvae develop entirely inside host aphids, which eventually become rigid mummies when the larvae pupate.

Aphidius is an outstanding searcher, and can locate new aphid colonies even when aphid populations are low.

### Use in Biological Control

- *Aphidius matricariae* parasitizes about 40 aphid species, including green peach aphid and closely related species (for information on aphids, see Sheet 340).
- Optimum conditions are daytime temperatures of 18-25 °C (64-77 °F) and relative humidity 60-80%.
- Aphidius is not effected by short-day induced diapause, so it can be used year-round.
- Aphidius alone will not provide control when aphid populations are high, but can be used with Aphidoletes and ladybeetles to provide control (see Sheet 240 & 244).
- Effectiveness may be reduced in late summer when Aphidius itself may be attacked by naturally occurring parasitic wasps (called hyperparasites).

### Monitoring Tips

Use a 10-15 X lens to inspect aphid mummies for round holes in the hind end, which indicates the adult parasites have emerged. A ragged emergence hole, in the top (mid-back) of the mummy indicates a hyperparasite has emerged (see diagram).

### Life Cycle

A complete life cycle takes 10 days at 25 °C (77 °F) and 2 weeks at 21 °C (70°F).

- Sex ratio in the population is about equal, although there may be slightly more females than males (50-60% females).

- Each female lays about 100 eggs in aphids but may attack 200 to 300 aphids in the process.
- The larvae develop entirely inside the aphids and do not kill their host until the wasp larva is ready to pupate.
- The larva pupate inside the aphid's body, which become a rigid, leathery, golden-brown mummy.
- Adults emerge from the mummies by cutting an exit hole in the top. The empty mummy remains on the leaf surface. The size of the adult parasite and the number of eggs it can lay, depends on the size of the aphid it came from.

### **Product Information**

Aphidius is shipped either as parasitized aphid mummies (pupae) from which adults will emerge, or as newly emerged adults. The advantage of shipping adults is that they usually arrive pre-mated and the supplier can ensure they are sent without hyperparasites.

Adults should be released immediately by walking along the rows, allowing them to fly out of the container.

If necessary, parasitized aphid mummies may be held at 4-10 °C (39-50 °F) for up to 3 days.

### **Introduction Rates**

Aphidius is most effective when aphid populations are low. Parasites can be introduced at low rates before aphids are detected in greenhouses or when aphids are likely to move onto crops outdoors. When aphids have been detected in a crop, higher release rates should be used over a period of at least 3 weeks.

Because of the time it takes for larvae to develop inside aphid mummies, use at least two releases one week apart to establish overlapping generations of the parasite. Most of the parasitized aphids leave the plant before mummies are formed and it has been found that if 10% of aphids found on leaves are mummies, that the population should soon collapse (Ramakers, 1989).

#### General introduction rates

- Before aphids are detected — 1,000 Aphidius/ha weekly (400/acre)
- After aphids are established — 5,000 Aphidius / ha (2000/acre) 2-3 times, one week apart.

#### Specific crops

- Greenhouse peppers — Before aphids are detected: 1,000 Aphidius/ha (400 Aphidius/acre) weekly. After aphids are established: 5000 Aphidius/ha (2000/acre), 2-3 times or until 10% of aphids on plants are mummies.
- Greenhouse tomatoes — 1 Aphidius/10 plants, weekly for 2 weeks.
- Greenhouse cucumbers — 1 Aphidius/plant, weekly until established.
- Ornamentals and outdoors — 0.1-3 Aphidius/m<sup>2</sup> (10 ft<sup>2</sup>) or 0.1-5 Aphidius/plant, weekly or until control is evident.

**Note:** The yellow sticky traps used for monitoring pest also trap Aphidius. If yellow traps are necessary for monitoring whitefly, do not release Aphidius near the yellow traps and use no more than 1 yellow trap per 100 plants. Aphidius are not attracted to blue sticky

traps, which can be used for monitoring thrips where Aphidius is being released for aphid control.

#### **For Best Results**

- During spring and summer, aphid populations grow too fast to be controlled by the parasite alone therefore it is advisable to introduce additional aphid predators such as *Aphidoletes aphidimyza* (see Sheet 240) and ladybeetles (see Sheet 244).
- In gardens, wash high populations of aphids from plants with a strong water spray before introducing the aphid parasite. Note: Aphidius does not attack many common aphid species, such as potato aphid so if mummies are not present check aphid identification.

#### **Using Pesticides**

*Aphidius matricariae* is likely to be sensitive to the same pesticides as *Encarsia formosa* (see Sheet 180).

Growth regulators used in crop production should not be harmful to Aphidius.

Spreader-stickers are likely to be harmful to Aphidius on contact, but do not have residual effect.

Insecticidal soap and pirimicarb (e.g., Pirliss®) can be used to reduce aphid numbers in hot spots without harming the pupal stage of Aphidius.