

# Aphelinus-System

**For biological control of bigger aphid species such as potato aphid and glasshouse potato aphid the parasitic wasps *Aphelinus abdominalis* and *Aphidius ervi* are used. The main advantages of *Aphelinus* are that an adult female keeps on parasitizing for several weeks and that it also feeds on aphids.**

## HOSTS

Of the more than 200 aphid species that *Aphelinus abdominalis* parasitizes, the potato aphid and the glasshouse potato aphid are the most common in greenhouses. Below a description of their appearance and life cycle is presented.

### 1. The potato aphid

The potato aphid (*Macrosiphum euphorbiae*) is a 2 - 4 mm tall, elongated aphid with relatively long legs. The antennae are longer than the body. The eyes are conspicuously red. The cauda (tail) is relatively long, and the cornicles are long with a dark tip. The potato aphid is usually green, but sometimes yellowish or pink. The larvae have a dark longitudinal line on the back.

The behaviour is also typical. Moreover the aphid easily lets itself fall.

Although this aphid usually hibernates on roses in North-America, in Europe it usually passes the winter in the greenhouse. The potato aphid has more than 200 host plants such as tomato, eggplant, sweet pepper, chrysanthemum, rose, pelargonium, tobacco and potato. It is often found on stalks or younger parts of a plant, and causes crimped tips that look like virus infestations.

### 2. The glasshouse potato aphid

The glasshouse potato aphid (*Aulacorthum solani*) is a middle-sized, round-oval aphid of 1.8 to 3 mm. Characteristic are the dark bands on the antennae, which are longer than the body. The cauda and cornicles are medium-long. Around the base of the cornicles, dark green patches can be seen. This aphid usually has a glossy yellowish green colour, but this can vary from white-yellowish green to brownish green.

The glasshouse potato aphid has no sexual phase, thus always reproduces viviparously on several host plant species. In the open field potato and several bulb crops are attacked. In the greenhouse the main hosts are sweet pepper, chrysanthemum, tomato, eggplant, lettuce and bean.

## *APHELINUS ABDOMINALIS*

The parasitic wasp *Aphelinus abdominalis* occurs naturally in large areas of Europe and Asia. It is a member of the family of the Aphelinidae, to which the whitefly parasites *Encarsia formosa* and *Eretmocerus californicus* also belong.

An adult *Aphelinus abdominalis* is on average 3 mm long, and has relatively short legs and short antennae. The female has a black thorax and a yellow abdomen. Males are somewhat smaller and have a darker abdomen. Usually, there are as many males as females.

*Aphelinus* does not often fly. When a female is looking for aphids, she walks rapidly on the leaf. When she has found an aphid, she touches it with her antennae, turns around, raises her wing tips and injects her ovipositor into the aphid.

Oviposition takes about 20 to 60 seconds. *Aphelinus* can parasitize any aphid stage, even alates (winged aphids).

The *Aphelinus* larva develops in the aphid. At 20°C (68°F) it pupates after 7 days and transforms the aphid into a black mummy. Eight days later an adult *Aphelinus* leaves the mummy.

Characteristic for *Aphelinus* is the long active oviposition period. The adult female does not immediately begin to lay eggs. On the 3<sup>rd</sup> or 4<sup>th</sup> day after emergence she begins to oviposit. She parasitizes 5 to 10 aphids per day for a period of approximately 8 weeks.

*Aphelinus abdominalis* also feeds on aphids (host feeding). Therefore the female punctures an aphid once or a few times with her ovipositor, turns around and sucks the haemolymph of her prey. She can also feed on aphid species which she does not parasitize. Moreover, *Aphelinus* can also eat honeydew.

*Aphelinus* can distinguish parasitized from non-parasitized aphids (host discrimination). Only very rarely will the female deposit a second egg into an aphid that has already been parasitized.

For optimal performance *Aphelinus* requires enough light and sufficiently high temperatures.

Although some hyperparasites of *Aphelinus* are known to exist, in practice it is not a problem.

## APPLICATION

Although *Aphelinus abdominalis* parasitizes several species of large-sized aphids, it is mainly used for biological control of potato aphid (*Macrosiphum euphorbiae*) and glasshouse potato aphid (*Aulacorthum solani*). *Aphelinus* is applied on several greenhouse crops such as sweet pepper, tomato, eggplant, bean, gerbera, rose, chrysanthemum ...

The parasitic wasps should be introduced in the greenhouse at the first signs of aphids. They are released in and around beginning hot spots at 0.5 - 2/m<sup>2</sup>, depending on the crop and the circumstances.

Remember that *Aphelinus* has a long-lasting but slow activity. For a faster control period, the parasitic wasp *Aphidius ervi* and the gall midge *Aphidoletes aphidimyza* may be more suitable. More advanced infestations are tackled with the ladybird *Adalia bipunctata* or with a chemical treatment with pirimicarb (Pirimor, Rapid, ZZ Aphox ...).

## APHELINUS-SYSTEM

*Aphelinus abdominalis* is supplied per 100 adults in a tube. The wasps are released low in the crop by tapping softly on the opened tube.

*Aphelinus* can be stored for a few days at 8 - 10°C (46.4 - 50°F).

### ADVANTAGES

- **Applicable in many crops;**
- **Longevity;**
- **Host feeding;**
- **No problems with hyperparasites;**
- **Parasitization is easy to recognize (black mummies).**