

Water trap best for c

How can the harmful *Duponchelia* insect best be trapped for optimum detection? A water trap was found to be most effective in a field test. Also, this trap requires little maintenance.

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The composition of the sex pheromone of *Duponchelia* was identified just over a year ago and now growers are using pheromone traps on a large scale for a timely detection of this difficult pest insect. The caterpillars of this moth cause damage in all sorts of fruit including sweet pepper, cucumber, tomato and melon.

The insect originates in the Mediterranean region and the Canary Islands, but it is also found in parts of Africa, Asia Minor and North Western. In the spring of 2005 the pest was reported in Canada.

In the first tests in 2006, the Wageningen research institute Plant Research International in the Netherlands used the *Duponchelia* pheromone in the most common trap types, the Delta trap and the Funnel trap. In these tests, catches in Funnel traps were much smaller than those in Delta traps.

Duponchelia prefers to land on a flat surface such as the



The water trap has a higher efficacy than the Delta trap and is most suitable for monitoring and mass-trapping of *Duponchelia fovealis*.

sticky insert in a Delta trap. The smooth surface of the water reservoir of a water trap is larger than that of a Delta trap and it has a much higher trapping capacity. During the last two years we have therefore compared these two trap types with each other, as well as with light traps, in the greenhouses of a begonia cutting grower.

During eight weeks (August-September 2007) a total number of 46 male moths were trapped in five Delta traps against 316 male moths in five water traps. The average number of male moths trapped in water traps was therefore over six times higher than in Delta traps. A total number of 263 moths, male as well as female, were trapped in the light traps.

The test showed that water traps are most suitable to attract males of *Duponchelia*. This makes the water trap the best trap for optimum detection and capturing of this harmful insect. Another advantage is the little maintenance required by this trap.

Early detection

The hidden behavioural pattern of *Duponchelia* and the high chance of the insect flying into the greenhouse during aeration are reasons why early detection of the adult insect – the moth – is extremely important to be able to decide the correct timing of control operations against the next generation of caterpillars.

Pheromone traps give a good indication of the flight



The Delta trap with glueboard is suitable to monitor *Duponchelia fovealis*.

Catching Duponchelia



The funnel trap is least capable of catching *Duponchelia fovealis* moths.



The moth stage of the *Duponchelia*.



The *Duponchelia* caterpillar causes damage in all kinds of crops.

behaviour of the male butterflies. They also enable proper monitoring of the effect of biological and chemical control measures. This helps growers to avoid control operations being too early or too late, or to continue control too long.

Pheromone traps can also be used for control by means of mass trapping of male insects. But in many countries, like the Netherlands, mass trapping is not allowed as these control methods need registration. When using for control, the number of traps should be increased - as more than 90% of the male moths should be captured to reduce the next generation.

Use of pheromones

Females of most butterfly species excrete a sex pheromone. These pheromones can attract male butterflies of the same species over large distances. Because the composition of the sex pheromone is different for each caterpillar species, a pheromone trap is a fairly simple instrument to establish the caterpillar species that are present in the greenhouse. The composition of the phe-

romone of hundreds of caterpillars has meanwhile been determined and these pheromones are now reproduced in the laboratory. About 1 mg pheromone in a dispenser is capable to lure male moths into a trap for four to eight weeks. ■

THREE TYPES OF TRAPS

The luring capacity of a pheromone trap for a specific insect species is largely determined by the composition and purity of the pheromone in the dispenser. It has also been found that for many species the trap type is an important factor as well for achieving an optimum result. There are three types of pheromone traps with different modes of action:

- The Delta trap with a loose sticky insert is the best known trap type. A disadvantage of the Delta trap is the fact that the sticky insert is fairly rapidly saturated by caught insects and dust and must therefore be replaced regularly.
- In the Funnel trap (also called catch pot or Unitrap) insects fall into a funnel ending in a pot from which they cannot escape. The trapping capacity of a Funnel trap is much higher than that of the Delta trap because the trap keeps functioning until the pot is full.
- The third type of trap is the water trap, consisting of a water reservoir covered by a roof. This reservoir is filled with water with some added soap, causing insects to directly sink. Just as the Funnel trap, water traps have a high trapping capacity. Water traps are successfully being used for mass trapping moths in vegetable crops in South America and Asia.

Insects of different species fly and land in different ways. The fact that the type of trap used may play an important role has been shown for many insect species - of which flights have been monitored for years by means of pheromone traps.