

Whiteflies in greenhouse production are usually controlled with *Encarsia formosa*. Certain circumstances such as high temperatures and presence of tobacco whitefly limit the effectiveness of this beneficial insect. The parasitic wasp *Eretmocerus eremicus* can help to overcome these limitations.

WHITEFLY

Two species of whitefly commonly occur in greenhouses: the greenhouse whitefly (*Trialeurodes vaporariorum*) and the tobacco or silverleaf whitefly (*Bemisia tabaci* or *B. argentifolii*). *Bemisia* whitefly occurs most often in warm climates such as the Mediterranean region and southern United States. *Bemisia* whitefly does not survive cold winters, which explains its low occurrence in northern regions of Europe and North America. Greenhouse whitefly can be found in more regions than *Bemisia*.

An adult whitefly measures about 1 mm and is typically covered with a white waxy powder. The female whitefly deposits its oval shaped eggs of 0.2 mm on the underside of young leaves at the top of the plant. The newly hatched larva is mobile during a few hours until it finds a suitable place on the leaf to settle. In subsequent larval stages and in the pupal stage, it does not move anymore. The four larval stages look very similar, but differ clearly in size. At the end of the pupal stage, an adult whitefly finally emerges from the pupa through a T-shaped exit hole. On tomato, development from egg to adult takes 20 days at 27°C and 38 days at 17°C, but on other host plants this can be quite different. Fertility also depends on temperature and host plant. At 17°C, a female lays 100-150 eggs on tomato, 250-300 eggs on cucumber and 450-600 eggs on eggplant.

Both larvae and adults suck plant juice. Extra plant juice absorbed by whitefly larvae is secreted as honeydew (sugar solution). Honeydew fouls the leaves and the fruits, which then become unmarketable. Often, moulds (*Cladosporium* spp.) grow on the honeydew, which interferes with photosynthesis and respiration of the plant. Moreover, whiteflies (especially *Bemisia* spp.) can transmit several viruses.

ERETMOCERUS: BIOLOGY

Eretmocerus eremicus is, like *Encarsia formosa*, a parasitic wasp for whitefly control. *Eretmocerus* can develop in any larval stage of the whitefly, but it prefers the second and early third stage. *Eretmocerus eremicus* lays its eggs under the whitefly larva. After 3 days, the translucent eggs turn brown. If an egg is laid in the first larval stage, a development rest occurs, *Eretmocerus* larvae will not develop before the whitefly larva has reached the second larval stage. The complete life cycle takes 17 to 20 days, depending on temperature and the larval stage of whitefly.

Two weeks after parasitization, the pupa will turn yellow, not black as is the case for *Encarsia*. In order to leave its host, *Eretmocerus* makes a small round hole in the parasitized whitefly, just as *Encarsia*.

Both males and females are lemon-coloured. The males are only dark yellow on the upperside of the thorax, a part of their underside is brown.

APPLICATIONS

Eretmocerus can be applied to control greenhouse whitefly (*Trialeurodes vaporariorum*) and tobacco whitefly (*Bemisia tabaci*).

Especially in protected cultures, in which high temperatures can occur, *Eretmocerus* can be applied (e.g. eggplant cultures). Very good results can be obtained when applying *Eretmocerus* in ornamental cultures (e.g. gerbera).

ADVANTAGES

Eretmocerus is *Encarsia formosa*'s welcome assistant in whitefly control because of the following advantages:

1. If the whitefly population is big (high insect pressure), *Eretmocerus* will perform more host feeding.
2. At high temperatures, *Eretmocerus eremicus* lives longer than *Encarsia*.
3. *Eretmocerus eremicus* is more resistant to pesticides than *Encarsia formosa* which is interesting for integrated pest management.
4. Both greenhouse whitefly and tobacco whitefly, can be parasitized by *Eretmocerus eremicus*.
5. Parasitized pupae are very easy to recognize due to their yellow colour.

SIDE EFFECTS

As *Eretmocerus* is a fairly new product for whitefly control, less data on pesticide side effects is available compared to *Encarsia formosa*.

Generally, *Eretmocerus* is more resistant to pesticides than *Encarsia formosa* (compared to *Encarsia*, there is a shorter persistence for *Eretmocerus* and it is more compatible with other products).

Biobest is currently carrying out numerous experiments to find out the side effects of pesticides on *Eretmocerus*.

ERETMOCERUS-SYSTEM

Eretmocerus is available on cards of 100 or as loose pupae. The pupae are packed per 5000 units, mixed with sawdust in a tube. With the help of these handy tubes, pupae can be spread very easily in the crop. It is very important to scatter the pupae on a dry surface avoiding direct sunlight. Only if necessary, Eretmocerus-System can be stored for a short time at 6-10°C.

ERETMIX-SYSTEM

This mix of parasitic wasps contains 50 % *Eretmocerus eremicus* and 50 % *Encarsia formosa*. It is delivered on cards of 100 or as loose pupae. The pupae are packed per 10.000 pieces, mixed with a carrier in a tube. Also at this mix it is important to scatter the pupae on a dry soil and avoid direct sunlight. Only if necessary, Eretmix-System can be stored for a short time at 6-10°C. You can find more information about *Encarsia formosa* in the technical sheet of Encarsia-System.

BIOBEST'S TECHNICAL ADVICE

1. Biobest advises to combine *Eretmocerus* with the Encarsia-System.
2. At temperatures above 20°C, it is recommended to introduce curatively about 6 parasitic wasps/m² for several weeks (i.e. enough whiteflies need to be present to introduce *Eretmocerus eremicus*).
3. In some cultures, introduction can be started at first signs of infestation (e.g. eggplant cultures), in other crops (e.g. tomato) start introduction in March. Introduce weekly 1 *Eretmocerus eremicus*/m² until parasitism is sufficient.

ADVANTAGES

- **Good activity at high temperatures;**
- **Longer lifetime;**
- **More resistant to pesticides than *Encarsia formosa*;**
- **Better action on *Bemisia* than *Encarsia formosa*;**
- **Simple introduction method;**
- **Offers a prolonged protection;**
- **Good results on eggplant and gerbera.**