
GENERAL

Before introducing beneficials, the greenhouse and plants should be free of harmful pesticide residues.

Before the beginning of your cultivation discuss with your advisor a plan of approach for the whole season.

SCOUTING AND MONITORING

Use yellow Bug-Scan[®] sticky traps for (timely) detection of flying insects. Hang during the heating of the greenhouse min. 20 yellow sticky traps per ha to detect the first flying insects.

Also use yellow Bug-Scan[®] sticky traps during the cultivation. Count and register during **minimum the first 10 weeks** of your cultivation the different kinds of flying insects which are captured on the sticky traps.

CONTACT WITH BENEFICIALS AND BUMBLEBEES

Follow carefully the user's instructions; always pay attention to the icons on the packing. If necessary consult the Icon Guide.

Introduce beneficials and bumblebees preferably early in the morning.

If you want to store the beneficials for a short time, you have to reckon with the storage temperature and the use by date which are mentioned on the packing.

CHEMICAL CORRECTIONS

If a chemical correction has been inevitable, use as much as possible selective chemical crop protection products. Try to apply chemical corrections on local spots.

In case of doubt about the side effects of pesticides, contact your advisor or consult the Side Effect Manual which is available on www.biobest.be.

BIOLOGICAL CONTROL OF THRIPS

Amblyseius-Breeding-System (A.B.S.)

(predatory mite - *Amblyseius cucumeris* in breeding sachets)



- Introduce minimum 4.000 sachets/ha (in total minimum 1 million *Amblyseius cucumeris*/ha).
- Starting: it is possible to start at first bloom.
- Warning:

The products Amblyseius-Breeding-System (ABS) and Amblyseius-Slow-Release-System (ASR), which contain the predatory mite *Amblyseius cucumeris* delivered in breeding sachets, also contain Mold mites (*Tyrophagus putrescentiae*) and bran. Under certain circumstances such as a moist greenhouse climate or when using large quantities of breeding sachets, Mold mite population can increase to the point of causing damages in some crops (e.g. cucumbers). When planning to use these products in crops where they have never been used before, we recommend to first perform a small-scale trial or to discuss this with your Biobest advisor or supplier.

Orius-System

(predatory bug - *Orius* spp.)

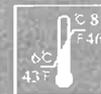


- Preventive: Introduce *Orius* at first bloom.
- Curative: Introduce *Orius* as from the moment that thrips (larvae or adults) are detected in the crop.
- Introduce in 2 introductions minimum 1 *Orius*/m².
- At an increasing thrips infestation: introduce *Orius* in and around the thrips hot spots. (minimum 5 – 10 *Orius*/m²)
- Remark:
 - Per packing maximum 5 – 10 introduction points.
 - *Orius* is useful if the cultivation period is long.

BIOLOGICAL CONTROL OF SPIDER MITE

Phytoseiulus-System

(predatory mite - *Phytoseiulus persimilis*)



- Introduce minimum 6 *Phytoseiulus*/m² as soon as the first spider mites are detected.
- The exact amount of *Phytoseiulus* depends on the severeness of the spider mite infestation. Introduce in and around the spider mite hot spots minimum 20 *Phytoseiulus*/m².
- Remark:
 - Introduce *Phytoseiulus* on the leaf, ± 15-20 cm under the top of the plant.
 - Reckon with the use of sulphur steamers till min. 5 days after introduction.

Californicus-System

(predatory mite - *Amblyseius californicus*)



- Introduce *Amblyseius californicus* preventive on places where spider mites are early expected, minimum 4 *Amblyseius californicus*/m².
- Introduce *Amblyseius californicus* preventive over the whole greenhouse, minimum 2 mites/m².
- Remark: Introduce *Amblyseius californicus* when there is enough bloom in the crop.

Feltiella-System(gall midge - *Feltiella acarisuga*)

- In combination with *Phytoseiulus* at spider mite hot spots.
- Introduce locally 1 pot (250 pupae) during 4 - 6 weeks.
- Remark: The gall midges have an excellent ability to search, but they can become disorientated by frequent use of a sulphur steamer.

BIOLOGICAL CONTROL OF APHID**Aphidius-System**(parasitic wasp - *Aphidius colemani*)

- Preventive: Introduce minimum 0,15 *Aphidius colemani*/m² per week.
- Curative: As soon as aphids are detected: introduce minimum 0,5 *Aphidius colemani*/m² per week, until an equilibrium is reached.
- When there is enough parasitization: introduce minimum 0,15 *Aphidius colemani*/m² per week to maintain the balance.
- Remark:
 - Start with the first introduction, not later than the first bloom.
 - When hyperparasitizing occurs, *Aphidius colemani* can be replaced by *Aphidoletes aphidimyza*.

Aphidoletes-System(gall midge - *Aphidoletes aphidimyza*)

- Preventive: Introduce 0,1 - 0,2 *Aphidoletes*/m²/week.
- Curative: When aphids are detected in the crop, introduce 0,5 – 1 *Aphidoletes*/m²/week.
- Open the bottle and put it under the aphid hot spot, or disperse *Aphidoletes*, in heaps, on a moist substrate.
- Remark: The gall midges have an excellent ability to search, but they can become disorientated by frequent use of a sulphur steamer.

Ervi-M-System(parasitic wasp - *Aphidius ervi*)

- When the first aphids are detected in the crop, introduce 0,1 – 0,25 *Aphidius ervi*/m²/week until an equilibrium is reached.
- Introduce the parasitic wasps at the bottom of the plant, preferably in the neighbourhood of aphid hot spots.

Adalia-System(ladybird - *Adalia bipunctata*)

- Introduce 50 - 100 *Adalia*-larvae/m² in the immediate neighbourhood of aphid hot spots, to support *Aphidius* and *Aphidoletes*.

Banker-System*(Rhopalosiphum padi* - open rearing system for the control of aphids)

- Introduce the first Banker-System together with the first release of beneficials.
- Introduce minimum 3-4 Banker-Systems/ha/week until there are minimum 10 Banker-Systems.
- Release 1 week after the introduction of the first Banker-Systems, 0,1 *Aphidius colemani*/m² until the first parasitized cereal aphids are detected.
- When hyperparasitizing occurs, *Aphidius colemani* can be replaced by *Aphidoletes aphidimyza*.
- Remark: Put the Banker-System in sunlight.

BIOLOGICAL CONTROL OF WHITEFLY

If you observe whiteflies in the crop, let your advisor determine the species. It is of great importance to know which whitefly species are present in the crop.

Encarsia-System*(parasitic wasp - Encarsia formosa)*

- Hang during the heating of the greenhouse minimum 20 yellow sticky traps per ha to observe the first whitefly.
- Curative: After detection of whiteflies, introduce during min. 4 weeks minimum 3 - 4 *Encarsia formosa*/m² until a satisfying number of whiteflies are parasitized (80 - 90 %).
- Remark: *Encarsia formosa* parasitizes preferably the greenhouse whitefly (*Trialeurodes vaporariorum*).

Eretmix-System*(mix of Eretmocerus eremicus & Encarsia formosa)*

- A mix of *Eretmocerus eremicus* + *Encarsia formosa* (50/50) for the control of the greenhouse whitefly (*Trialeurodes vaporariorum*).
- Curative: As from February introduce during 4 weeks minimum 3 - 4 *Eretmocerus eremicus* + *Encarsia formosa*/m² until a sufficient number of whiteflies are parasitized (80 - 90 %).

BIOLOGICAL CONTROL OF LEAFMINER**Dacnusa-Mix-System / Diglyphus-System***(parasitic wasps - 90 % Dacnusa sibirica & 10 % Diglyphus isaea)*

- When the first leafminers are detected, introduce minimum 0,25 *Dacnusa* / *Diglyphus* (90 % - 10 %) m² per week, until an equilibrium is reached.
- When the leafminer infestation increases, introduce 100 % *Diglyphus* at a dose of minimum 0,1 *Diglyphus*/m²/week during minimum 3 weeks or until a sufficient number of leafminers are parasitized.
- Remark: Samples of the leaf should be tested regularly to determine the percentage of parasitized leafminers. To have a satisfying control, the percentage must be 80 - 90 %.

BIOLOGICAL CONTROL OF CATERPILLARS

Attract[®] pheromone lures



- For the detection of the first moths in the greenhouse.
- Hang minimum 2 **Attract[®]** pheromone lures per ha.
 - ⇒ Hang the **Attract[®]** pheromone lures minimum 50 m from each other to prevent a mixture of the pheromones.
 - ⇒ Replace the pheromone capsules regularly (every 4 weeks).