TECHNICAL SHEET

Majusculus-System

The pirate bug *Orius* seems to be the most voracious beneficial insect against thrips. It is the only predator that also attacks full-grown larvae and adult thrips. Often an *Orius* with a thrips stuck on its rostrum can be seen walking on a leaf.

Thrips

Adult thrips are small, elongated insects with typically long fringed wings. They measure about 1 mm, and have a greyish or yellow to brown colour. The two most common harmful species are the onion thrips (*Thrips tabaci*) and the Western Flower Thrips (*Frankliniella occidentalis*).
The female thrips deposits eggs in the leaf tissue. The eggs hatch within a few days into very mobile nymphs which immediately begin to feed. After the second instar they drop on the ground to pupate. The total development from egg to adult takes from 20 days at 20°C (68°F) to 12 days at 30°C (86°F). At sufficiently high temperatures one female thrips can produce up to 100 offspring.
Thrips damage the crop by withdrawing the plant cell fluids. Empty cells are filled with air, causing a silvery appearance, on which dark spots (excrement) are visible. Moreover, there exist many more symptoms of damage depending on the crop. For instance, thrips on very young cucumber fruits result in deformed fruits. In sweet pepper, they cause cosmetic damage on the fruits close to the calyx. In several ornamentals, flower damage through discoloration or deformation occurs. Only a few individual thrips are enough to cause damage. Moreover, thrips are important vectors of several viruses (e.g. Tomato Spotted Wilt Virus, TSWV).

Biology

For biological thrips control several *Orius* species are available, such as *Orius laevigatus* and *Orius majusculus*. *Orius*, also called the flower bug, is a small bug with a long mobile rostrum (feeding tube) that it can fold under its body. The red eyes are typical. The most commonly used species are brown to black with white patches on the wings. Females are about 3 mm long, while males are slightly smaller.
A female *Orius* lays 1 to 3 eggs per day embedded in the plant tissue of petioles, stalk parts or veins on the underside of the leaf. Out of these colourless to white eggs of 0.4 mm, an *Orius* nymph emerges after about 5 days. The colour of the nymph depends on the species, but the red eyes are always conspicuous. The duration of the five nymphal stages is between 14 and 15 days. Adult longevity is dependent on food supply and temperature, but males do not live as long as females. At 26 °C, with *Frankliniella occidentalis* adults as food, it lives for about 20 days.

Adult *Orius* eat all thrips stages, while younger *Orius* nymphs only eat thrips larvae. Moreover, *Orius* also devours other preys such as aphids, spider mites, whiteflies or moth eggs. They always find their prey by touch, grab it with their front legs, insert their rostrum and drain the prey of its body fluids. They sometimes kill more insects than strictly necessary for their own feeding. Moreover, *Orius* also eat pollen, which enables them to build up a population in pollen bearing crops without the presence of thrips.
Some *Orius* species enter diapause at shorter day lengths, while this does not seem to affect other species or strains.

Applications

Orius is used in a wide range of crops to control thrips. In pollen bearing crops (sweet pepper, gerbera, strawberry, eggplant …) *Orius* can be introduced preventatively as 0,5 - 1 pieces/m² as soon as there is enough flowering. In combination with other thrips beneficials (*Amblyseius cucumeris* and/or *Amblyseius degenerans*) the growing population will protect the crop during the whole cropping season.
In several greenhouse vegetable and ornamental crops, *Orius* can be introduced curatively in and around the hot spots at a rate of 5 - 10 bugs per m².
In cucumber, a crop that does not produce pollen, *Orius majusculus* can be introduced preventatively. This bug also eats other preys and can feed on plant saps. However, because susceptibility to diapause, this species can only be used in summer time.
When using *Orius*, it should be kept in mind that *Orius* is sensitive to several pesticides. For instance, the application of teflubenzuron (Nomolt, Dart) can dramatically affect an *Orius* population.

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Majusculus-System

Biobest offers *Orius majusculus* in 250 ml plastic bottles. Each bottle contains 1.000 adults and nymphs in a vermiculite carrier. *Orius* is distributed in the crop in sufficiently large piles on a leaf. The piles are left untouched for a few days so that the bugs get a chance to mate and spread throughout the crop. Orius can be stored briefly at a temperature of 8-10°C.

ADVANTAGES

- **Applicable in a wide range of crops;**
- **Can be introduced preventatively in pollen bearing crops;**
- **Can be introduced curatively in hot spots;**
- **Often kills more thrips than needed for own feeding;**
- **Also attacks other pest insects;**
- **Can be combined with other thrips predators.**

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