TECHNICAL SHEET

Insidiosus-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

Orius insidiosus is an excellent predator of thrips. *Orius*, also called the minute flower bug or minute pirate bug, is a true bug with a long mobile rostrum (feeding tube) that can fold under its body. Females are about 3 mm long (1/9 inch), while males are slightly smaller. Female *Orius* lay 1-3 eggs per day embedded in plant tissues (petioles, stalk parts or veins on the leaf underside); eggs are colourless to white. An *Orius* nymph emerges after about five days. A newly emerged nymph is at first colourless, but turns yellow after a few hours. Through the five nymphal stages, it progressively becomes yellowish-orange, then brown and gradually looks more like an adult. All nymphal stages of *Orius* have red eyes. Wing pads start to develop at the 2nd stage but are clearly visible at the 5th stage only. Adults are brown to black with white patches on the wings. Total development time (egg to adult) is about three weeks. Adult *Orius*, which live for 3-4 weeks, eat all thrips stages, while younger *Orius* nymphs only eat thrips larvae. They find their prey by touch, grab it with their front legs, insert their rostrum and drain their prey of its body fluids. *Orius* can also feed on other prey such as aphids, mites or moth eggs. They sometimes kill more insects than strictly necessary for their own feeding. *Orius* also eat pollen, which enables them to live in pollen bearing crops without the presence of thrips. *Orius* can enter into diapause when there are no thrips to feed on, daylength is shorter than 12 hours and temperature is below 15°C (59°F).

Applications

Orius insidiosus can be used in a wide range of crops. Since *Orius* is a long-lived bug, and takes time to reproduce and become established, it is important to introduce *Orius* as early as possible. In pollen bearing crops such as sweet pepper, gerbera, strawberry and eggplant, *Orius* can be introduced preventatively at a rate of 1-2 *Orius* per m² (10 ft²) as soon as there is sufficient flowering. In non-pollen bearing crops, 1-2 *Orius* per m² (10 ft²) should be introduced when thrips are first detected (more introductions might be necessary). Successful control of thrips throughout the whole cropping season can be achieved by using *Orius* in combination with other thrips predators such as *Amblyseius cucumeris* and *Amblyseius degenerans*. In several greenhouse vegetable and ornamental crops, *Orius* can be introduced curatively in and around hot spots at a rate of 5-10 *Orius* per m² (10 ft²). When using *Orius*, keep in mind that it is sensitive to several pesticides.

Insidiosus-System

Biobest offers several *Orius* species in plastic bottles. Each bottle contains 500 or 1.000 adults and nymphs in a practical dispersal 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;**
- **Is a generalist predator (can also feed on aphids, mites or moth eggs);**
- **Can be combined with other thrips predators.**

Miscellaneous

- Introduction rates can be influenced by climate, season, location and crop;
- It is always better to use the Insidiosus-System as soon as possible after receipt. If storage is unavoidable, keep at a minimum of 8°C (46°F) (not lower) for the shortest amount of time possible;
- Always use the Insidiosus-System before the expiry date stated on the label;
- Pesticides (insecticides, nematicides, fungicides, etc.) can have short or long-term negative effects on one or more stages of beneficial organisms. Please, be careful if or when choosing pesticides. Consult Biobest publications or website for the side-effects of pesticides on beneficial organisms;
- For additional information, please consult our website, or contact a Biobest supplier or technical advisor.

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