

Insidious Flower Bug

Biological Control Agent of Greenhouse Insect and Mite Pests

The insidious flower bug, *Orius insidiosus*, is a predatory biological control agent that can be released into greenhouse production systems to manage populations of greenhouse insect and mite pests, such as aphids, spider mites, thrips, and whiteflies. This publication discusses topics associated with the insidious flower bug, including biology, feeding behavior, commercial availability, and use in greenhouses.

Biology

Insidious flower bug adults are approximately $\frac{1}{8}$ of an inch (3.0 millimeters) long, black, and flattened with wings patterned black and white (Figure 1). Males are generally smaller than females. The female lays two to three eggs per day inside plant stems, leaves, and leaf petioles; laying up to 130 eggs during her lifespan. The nutritional quality of plants can influence the number of eggs laid by females.

Nymphs emerge (eclose) from eggs in four to five days. Emerging young nymphs are initially light brown, turning dark brown as they become older (Figure 2a). All nymphs have bright red compound eyes. There are five nymphal instars (stages between each molt). Nymphs become adults in 15 to 20 days, with adults living up to 28 days. Optimal temperatures for development are between 60 and 85 degrees Fahrenheit (15 and 26 degrees Celsius). The life cycle (egg to adult) can be completed in about 15 days at 77 degrees Fahrenheit (25 degrees Celsius).



Figure 1. Insidious flower bug, *Orius insidiosus* bug, adults (Photo: Raymond Cloyd).

Feeding Behavior

The insidious flower bug feeds on a wide range of insect and mite pests found in greenhouse production systems, including aphids, spider mites, thrips, and whiteflies. The insidious flower bug can manage populations of the twospotted spider mite, *Tetranychus urticae*, and the western flower thrips, *Frankliniella occidentalis*, when present at the same time, but prefers to feed on western flower thrips.

Insidious flower bug nymphs and adults feed on western flower thrips larvae and adults (Figure 2b) located on plant leaves and/or in flowers. Insidious flower bug nymphs and adults can consume more than 20 western flower thrips per day, although they tend to feed on larvae more so than adults when both life stages are present. Insidious flower bug adults feed on plant fluids and pollen in the absence of prey.

The insidious flower bug can provide effective management of western flower thrips populations in ornamental and vegetable greenhouse production systems when introduced alone or with other biological control agents such as predatory mites. An advantage of releasing the insidious flower bug instead of the predatory mites, *Neoseiulus cucumeris* and *Amblyseius swirskii*, is the insidious flower bug nymphs and adults feed on the larvae and adult life stages of the western flower thrips, while the predatory mites only feed on the first instar larvae of the western flower thrips.



Figure 2a. Fifth instar nymph of insidious flower bug, *Orius insidiosus*. **Figure 2b:** Insidious flower bug, *Orius insidiosus*, fifth instar nymph feeding on western flower thrips, *Frankliniella occidentalis*, adult (Photos: Nathan Herrick).

Improving Effectiveness

The use of banker plants may improve the effectiveness of the insidious flower bug in managing western flower thrips populations in greenhouse production systems. Banker plants are noncrop plants that provide an alternate food source (prey), as well as nectar, when in flower. Certain cultivars of ornamental pepper, *Capsicum annuum*, including 'Black Pearl' or 'Purple Flash', are recommended for use as banker plants because adult western flower thrips feeding within the flowers attract insidious flower bugs, which promotes the establishment of insidious flower bugs within a crop. Insidious flower bugs have a higher population growth on 'Purple Flash' than on 'Black Pearl', so 'Purple Flash' may be a better banker plant.

Effect of Plants on Insidious Flower Bug

Certain plants may negatively affect the ability of the insidious flower bug to effectively manage insect pest populations. For example, insidious flower bug will not establish on tomato, *Solanum lycopersicum*, plants resulting in minimal management of western flower thrips populations. The glandular hairs (trichomes) on the leaves and stems of tomato plants can entrap insidious flower bugs (Figure 3), interfering with their ability to locate and prey on western flower thrips larvae or adults.



Figure 3. Insidious flower bug adult entrapped by glandular trichomes (Photo: Raymond Cloyd).

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Commercial Availability and Use in Greenhouses

The insidious flower bug can be purchased from biological control suppliers and distributors. Adults are shipped in containers with either buckwheat hulls or vermiculite as carrier material.

Release insidious flower bug adults evenly throughout the greenhouse, distributing them on plant leaves (Figure 4) and open flowers. Release insidious flower bugs in the early morning or late afternoon. A supplemental food source, such as the dead eggs of the Mediterranean flour moth, *Ephestia kuehniella*, may retain insidious flower bug adults on the crop; thus enhancing their ability to manage western flower thrips populations. Refer to biological control supplier or distributor catalogs for information on release rates of the insidious flower bug.

Short (less than 12 hours) or long (greater than 12 hours) day lengths or photoperiods do not affect the ability of insidious flower bugs to feed on insect and mite pests. Therefore, insidious flower bug can be released anytime during the growing season (fall, winter, spring, or summer) to manage western flower thrips populations on greenhouse-grown crops.



Figure 4. Buckwheat hulls or vermiculite are the inert carrier materials when releasing insidious flower bug, *Orius insidiosus*, adults onto plants (Photo: Raymond Cloyd).

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