

Biological Control Agents for Western Flower Thrips

Question: I am interested in implementing a biological control program against the Western flower thrips, *Frankliniella occidentalis*, in my greenhouse operation. Can you provide information on the commercially available biological control agents?



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Answer: There is a general interest among greenhouse producers in the U.S. to implement biological control programs designed to reduce problems with Western flower thrips. One of the primary reasons is that certain populations of Western flower thrips in greenhouses have developed resistance to insecticides commonly used to suppress populations.

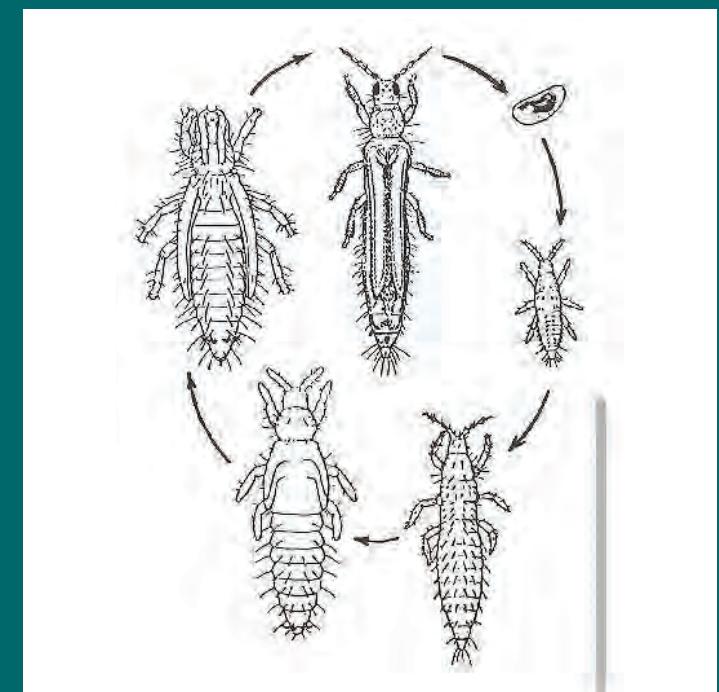
Biological control of Western flower thrips involves an aggressive augmentative program where biological control agents are released preventatively — almost before Western flower thrips are detected with follow-up releases made at weekly intervals based on information obtained from scouting crops. Scouting is critical in determining population trends of Western flower thrips throughout the growing season and helps in timing the release of biological control agents.

There are a number of commercially available biological control agents including: predatory mites, a predatory bug and a predatory rove beetle. Table 1 provides information on the commercially available biological control agents that can be released in greenhouse production systems to regulate Western

flower thrips throughout the growing season and helps in timing the release of biological control agents.



WESTERN FLOWER THrips LIFE CYCLE



Which Life Stages are Susceptible to Biological Control Agents?

- *Neoseiulus (Amblyseius) cucumeris*: 1st Instar Larva
- *Amblyseius swirskii*: 1st (and 2nd) Instar Larvae
- *Orius insidiosus*: 1st, 2nd Instar Larvae, and Adult
- *Stratiolaelaps scimitus ('Hypoaspis miles')*: Pupae
- *Dalotia (Atheta) coriaria*: Pupae

▲ Figure 1. The life cycle of the Western flower thrips (*Frankliniella occidentalis*) and life stages (larvae, pupae, and adult) that are susceptible to commercially available biological control agents.

SCIENTIFIC NAME	PREDATOR TYPE	COMMENTS	
<i>Neoseiulus (Amblyseius) cucumeris</i>	Predatory Mite (Aboveground)	Adults are 1.25 mm long and pale brown to tan-brown in color. Only attacks the first instar larvae. Adults consume one individual per day. Will feed on pollen as an alternative food source in the absence of prey. Females lay up to 35 eggs during their 30-day lifespan. Most active at temperatures between 60 and 86° F.	
<i>Amblyseius swirskii</i>	Predatory Mite (Aboveground)	Feeds on the first instar larvae. Can consume 10 individuals per day. Will feed on pollen as an alternative food source in the absence of prey. Most active at temperatures between 77 and 83° F. Female adults lay two eggs per day. A relative humidity >70% will prevent eggs and larvae from desiccating.	
<i>Statiolaelaps scimitus ('Hypoaspis miles')</i>	Predatory Mite (Belowground)	Adults are brown and inhabit the top 1 inch of the growing medium. Females lay eggs directly in the growing medium. Nymphs and adults feed on the pupal stages (prepupae and pupae).	
<i>Orius insidiosus</i> (Insidious Flower Bug)	Predatory Bug (Aboveground)	Adults are black, 2 to 5 mm in length with distinctly patterned black and white wings. Nymphs and adults feed on the larvae and adult life stages of the Western flower thrips. Can consume about 20 individuals per day. Release two or more adults per plant in greenhouses.	
<i>Dalotia (Atheta) coriaria</i>	Predatory Rove Beetle (Aboveground)	Adults are glossy, dark brown, and 3 to 4 mm long. Adults and larvae reside in the growing medium; feeding on the pupal stages (prepupae and pupae). Adults can fly and will disperse within a greenhouse in search of prey. Apply directly to the surface of the growing medium	

Table 1. Scientific name, predator type, and comments associated with commercially available biological control agents of the Western flower thrips, *Frankliniella occidentalis*.

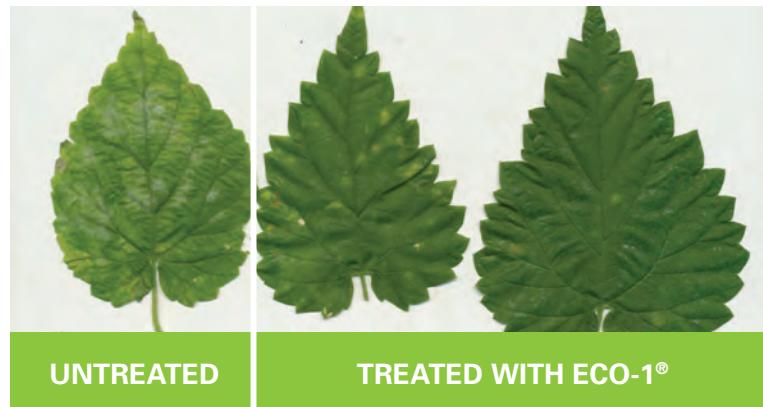


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