

Nemasys®

Advanced Biocontrol for Western Flower Thrips

Nemasys® is a proprietary formulation of the naturally occurring insect-parasitic nematode, *Steinernema feltiae*. These nematodes are released in their infective juvenile stage to search out and enter insect pests. Once inside, the nematodes release symbiotic bacteria that quickly kill targeted insects. Reproduction inside the insect releases new generations of infective juvenile nematodes that disperse in search of further prey.

Nemasys quickly controls larval stages of fungus gnats (*Bradysia* spp.), and the adult and pupal stages of western flower thrips (*Frankliniella occidentalis*). When applied to the soil, Nemasys will provide prolonged protection against pest re-infestation. Nemasys is ideally suited for use in integrated pest management programs as an important tool for resistance management, worker safety and environmental responsibility.



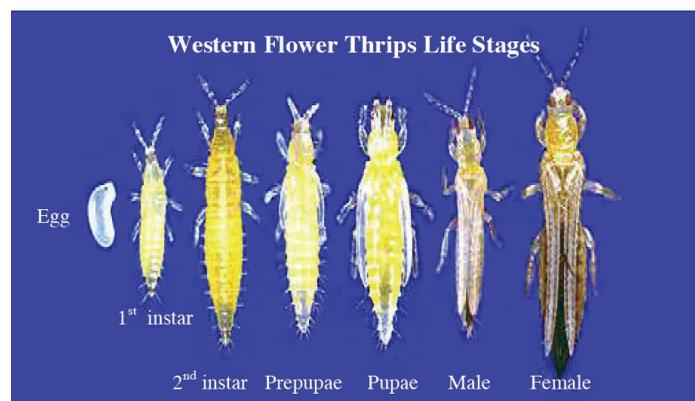
Adult western flower thrips. ¹

Western Flower Thrips Biology and Life Cycle

Adult western flower thrips are tiny (<2 mm), slender insects with fringed wings ranging in color from yellowish to dark brown. Females are slightly larger than males and can lay 130-230 eggs directly into plant tissues such as leaves, bracts, and petals.

Females do not require the presence of a male in order to produce viable eggs. Eggs that hatch usually are biased towards females and will go through two actively feeding larval (nymphal) instars that are followed by nonfeeding prepupal and pupal instars.

Depending on the plant species/variety, growth stage, flowering vs. vegetative, and flower color, larvae may choose to pupate on foliage or in the soil. Under ideal conditions, WFT may take as little as one to two weeks to go from an egg to adult and will have multiple generations per year as long as conditions are warm enough for their reproduction (>50 °F [10 °C]). WFT will not overwinter outside if freezing temperatures are reached.



(Continued)

Western Flower Thrips Damage

Thrips feed on a range of plants including impatiens, fuchsia, chrysanthemum, geraniums, marigolds, daises, petunia among others. Thrips feed by piercing plant cells with their mouthparts and sucking out contents. Damaged plant cells collapse, resulting in deformed plant growth, flower deformations, silvered patches and feces flecking. Thrips feeding in flower buds can cause the flowers to abort.

In addition to direct feeding injury, WFT can vector two tospoviruses: the impatiens necrotic spot virus and the tomato spotted wilt virus. During feeding, larvae inject saliva into plant cells before the contents are withdrawn. Transmission of tospoviruses to unaffected plants occurs as the larvae and adults feed. Only larvae can acquire the virus, but the virus can be passed onto the adult that continues to spread the virus. Adult thrips do not pass the virus to eggs.

Monitoring greenhouse areas for WFT infestations is important, because early detection is key to maximize control of the pest. Indicator plants (petunia, fava bean) and blue sticky cards (one card/1000 ft²[100 m²]) are the best methods to monitor pest populations. Indicator plants also can be used to determine if WFT are infected with tospoviruses. Remove flowers and place a non-sticky card above the indicator plants. Tolerance levels will depend on the crop, stage of growth, and the plants tolerance to WFT damage. Contact your local extension agent for tolerance levels.

Program Details

Begin a Nemasys® program early in a growing cycle by drenching soil at a rate of 50 million/1100 ft² (100 m²). Apply in a sufficient volume of water to thoroughly soak the soil or growing media, but not until water leaches from pots, typically 30-50 gallons/1000 ft² (115-190 L/100 m²). Following the initial soil drench application, begin weekly or twice weekly foliar application using a light rate of 50 million/4400 ft² (400 m²) or a heavy rate of 50 million/2200 ft² (200 m²). For foliar applications, apply in a sufficient volume to assure uniform foliar coverage, but do not apply to run-off, typically 2.5 gallons/1000 ft² (10 L/100 m²).

Applications should be made in the early morning or late evening to target thrips when their mobility is generally low and to avoid nematode desiccation. Do not apply in direct sunlight. Use blackout curtains, close vents, and switch off artificial lighting during and for at least 2 hours after application so as to minimize both UV light and heat exposure to the nematodes. Spray adjuvants will promote improved application uniformity and allow nematodes to reach the pest more effectively.

Remove all sprayer filters of 50 mesh or finer and maintain pump pressure below 300 psi to avoid damaging nematodes. Soil or growing media temperatures should be between 50-86 °F (10-30 °C).



Entomopathogenic nematode.

¹ Jack T. Reed, Mississippi State University, Bugwood.org