

# Propagation Crop Recommendation

By Evergreen Growers Supply LLC

## OVERVIEW:

The best way for growers to protect their crops from pests is to act preventatively. Using beneficial insects during propagation can save growers a lot of money in the long run by stopping pests from establishing populations and becoming a problem.

Research has shown that fresher beneficial insects are healthier and more vigorous. For more effective beneficial insects, growers should avoid cold storage practices. Refrigerating insects for just 24 hours could potentially stunt their abilities to hunt and control prey.

## PRIOR TO PLANTING

Many commercial growers time propagation in the fall and winter. During these colder months, insects are hardened and desperately searching for places to seek refuge. Usually pest numbers are lower during these months, but the existing bugs are the champions of the species. They are usually the most pesticide-resistant and tend to be physiologically built to withstand winter conditions. Areas within your greenhouse where insects can hide must be cleaned and inoculated with biological controls, such as *Stratiolaelaps scimitus*.

Spider mites tend to the “red phase” in September, sensing the decline of sunlight. In this phase, spider mites are more resistant to both chemicals and biological controls, such as *Phytoseiulus persimilis* (“persimilis”). If the house has a history of spider mites, growers should aim to achieve control before the fall begins. Once the spider mites begin overwintering, *Stratiolaelaps* should be applied to the bases of all of the support posts, along the perimeter walls and any other location where the spider mites could work their way into the ground.

After issues with flying pests such as whiteflies, aphids, or thrips, thoroughly cleaning all plant material in the greenhouse is essential. Two weeks prior to setting out new plants, growers should place at least one monitoring plant in their greenhouse to attract the surviving pests. We recommend bush beans. For best results, don't buy plants from a store. Instead, plant the bush beans from seed. ‘Strike’ and ‘Provider’ are the two best

varieties. The beans will attract many pests that were missed in the initial clean up.

Using a handheld vacuum on these monitoring plants daily can actually eliminate the issue after a few days. If the only pest you're dealing with is either greenhouse whiteflies or green peach aphids, these monitoring plants can be shifted to banker plants. They can also be shifted to killing plants by applying a systemic pesticide. Killing plants are recommended if you are dealing with *Bemisia*, foxglove aphids, or thrips.

Shore flies, while not actually a pests by definition, can be true pests for greenhouses. Not only can shore flies move fungus spores from plant to plant, they will also transport mites. Research has shown that phoretic (or in this case “hitchhiking”) behavior in mites is much more widespread than previously believed. Pest mites mobilize by grabbing on to the legs of flying insects. Shore fly populations should be tackled by thoroughly cleaning all of the drains in the greenhouse. Shore flies need standing water to breed. Growers can release *Atheta* directly into freshly cleaned drains to hunt bad bugs like the shore fly. *Atheta* tend to have a big appetite and can have a significant impact. Propagators with flood floors have a significant challenge maintaining drain sanitation.

## GETTING STARTED

Many pests do not go after plants during the early stages of propagation because the levels of humidity are too high for them to survive. The most



[evergreengrowers.com](http://evergreengrowers.com) | [info@evergreengrowers.com](mailto:info@evergreengrowers.com)

503.908.1946  
15875 SE 114th Ave  
Building 1 Suite G  
Clackamas, OR 97015

significant pest during the early stages of plant life is the fungus gnat. Fungus gnats can be a terrible issue because the larvae feed directly on the fine root hairs, reducing growth rates and injuring plants. This can leave your crop exposed to fungal disease.

Adult fungus gnats are capable of transporting fungus of all stages, as well as mites. While the incidence of broad mite is low, it can also cause considerable damage at this stage because they enjoy very high humidity.

Control of fungus gnats is best accomplished by applying *Stratiolaelaps* at the beginning of the process. We can consult about application rates and precise timing according to your pest pressure and budget. An application of nematodes may be needed if the conditions favor fungus gnats more than *Stratiolaelaps*. (For more information about beneficial nematodes, please see the section titled Fungus Gnats.)

## PREVENTION OF COMMON PESTS

### WHITEFLY (Aleyrodidae)

For whitefly prevention, release *Encarsia* at a rate of 0.5 wasps per 10 square feet weekly, alternating release points. Use bush beans for monitoring and trapping plants. If any whiteflies are seen, increase rate to 1 wasp per 10 square feet.

If *Bemisia* or any other type of whitefly is present or anticipated, release *Delphastus* at a rate of 0.1 beetles per 10 square feet, every 2 weeks. *Delphastus* are excellent searchers, finding the whitefly by smell. One release point per 2.5 acres is all that is needed. Despite being reared on greenhouse whitefly, they prefer *Bemisia* and will target them first. *Bemisia* are also harder to locate during scouting, as they tend to “clump” more than greenhouse whitefly.

### APHIDS (Aphidoidea)

Release *Aphidoletes* at a rate of 0.2 midges per 10 square feet weekly. This rate is for two release points of 1,000 each per 2.5 acres. To ensure the *Aphidoletes* disperse and search, avoid releasing them right near the aphids. If foxglove aphids are present, place petunia killing plants throughout.

### SPIDER MITES (Tetranychidae)

As mentioned above, a thorough cleanup is essential before the mites begin hibernating. If spider mites are still present, release 0.1 *Stethorus punctillum* per 10 square feet weekly. These beetles find all species of spider mite by smell and are extremely voracious.

*Amblyseius fallacis* (“fallacis”) can be used to take preventative action against spider mites. Apply fallacis at a rate of 2 mites per square foot. This mite predator evenly establishes itself throughout the crop, preventing spider mites under normal conditions.

Another predatory mite that works best when used preventatively against spider mites is *Neoseiulus californicus* (“californicus”). Growers will see best results when californicus is allowed to build up before the spider mite populations are able to establish themselves. Californicus is tolerant of various temperatures and low humidity, but works best under warm to hot conditions. It tolerates higher temperatures and lower humidity than persimilis.

### THRIPS (Thysanoptera)


Growers can try to prevent thrips infestations by offering a monitoring or trapping plant that thrips prefer to target. While bush beans work generally well as monitoring plants, dwarf sunflowers are excellent for attracting thrips. They are an obvious flower and produce high levels of pollen and nectar.

Thrips are tropical and are very attracted to vanilla. By adding vanilla to your yellow or blue sticky cards, you can attract up to 5 times more thrips. Spritz the vanilla extract (or almond extract) onto a cotton ball and stick it to the sticky card. If thrips are present, release 1,000 *Amblyseius cucumeris* (“cucumeris”) per 10 square feet to the affected site. Also, reintroduce *Stratiolaelaps* at the affected site to ensure that they cannot cycle in the house.

### FUNGUS GNATS (*Bradysia coprophila*)

A continuation or a recurrence of fungus gnats should be controlled by using nematodes, provided that there is still a detectable level of *Stratiolaelaps* present. When applied to the soil, the beneficial nematode *Steinernema feltiae* will provide





prolonged protection against pest re-infestation. Beneficial nematodes (*Steinernema feltiae*) are microscopic worms that attack and kill targeted insects without affecting any other organisms. Within the infected insect, the beneficial nematodes continually reproduce and then spread out for long-term control.

*This document was prepared in part by Applied Bio-nomics Ltd.*



[evergreengrowers.com](http://evergreengrowers.com) | [info@evergreengrowers.com](mailto:info@evergreengrowers.com)

503.908.1946  
15875 SE 114th Ave  
Building 1 Suite G  
Clackamas, OR 97015