



Sound Horticulture

Beneficial Insect Release Sheet

Aphidoletes aphidimyza:

When you receive your plastic tray of midge pupae, consider holding them in an office, greenhouse, or other warm, protected area away from moisture and direct sun. With the container remaining closed, observe the hatch rate for a couple days (or more depending on ambient temperatures) until you see that about 50% of midges have hatched. Take your container out to the grow area in a central location and prop the container open wide enough to allow for emergence. Make sure the lid stays propped, and container is protected from overhead watering, while allowing insects to emerge. Make sure the tray does not get too dry, and may need a light misting. Subsequent releases should be made from the original locations.

Amblyseius cucumeris, *A. swirskii* and *Amblyseius andersoni*

A. cucumeris comes in three forms:

- 1) Sachets: contain approximately 1/8 cup of carrier with predators and a food source. The sachets are a slow release, miniature breeding ground and should be hung throughout the greenhouse or growing area with the little cardboard tag. DO NOT cut or tear open. There is a small hole, which they crawl out of.
- 2) 1 liter Bottles: Before application, carefully rotate bottle to distribute mites throughout the vermiculite. Gently shake and disperse over leaves or on growing medium in contact with plant leaves and stem.
- 3) 5 liter Bags (A. cucumeris only): Insects come in grow media and can be shaken across grow media with a small scoop.

Amblyseius fallacis and *P. persimilis*

Amblyseius fallacis come in two forms:

- 1) Vials and bottles with vermiculite or corn grit carrier: disperse evenly with carrier over the leaf material in your grow space. For precision application of *P. persimilis*, take off the lid and allow the mites to crawl to the rim of the bottle. Tap bottle to each leaf or hot spot.

- 3) Bean Leaves in tray: separate leaf foliates and place on growing material throughout the grow space.

Approximate rates are 2+ per square foot, however, rates will vary depending on temperatures, season, pest populations, and crop species.

Aphidius colemani

If you are limited for time, consider releasing the *A. colemani* first as they are very delicate. When you receive your vial or bottle container of *A. colemani*, you will want to estimate what percent have emerged from their mummies. Depending on the hatch rate, you may consider

holding them at room temperature until 50% or more have emerged and have taken flight. It is recommended that sticky cards be removed prior to release. With an open upright container, walk through the grow area and allow the insects to fly out of the container while gently tapping the container if need be. If they are emerge too quickly, simply fasten the lid on the container and periods throughout the walk through. If there is concern that not all have emerged, place the bottle upright in the foliage. Approximate release rates are 5+ per 100 ft. sq., however, rates will vary depending on temperatures, season, pest populations, and crop species.

Chrysoperla rufilabris:

Lacewings come in 5 forms:

- 1) Eggs in bottle with food and filler: Simply disperse evenly with carrier over the leaf material in your grow space.
- 2) Eggs on cards: Each card contains 5000 per card. Divide the larger card into smaller sections and hang throughout you grow as close to the foliage as possible. Protect from watering.
- 3) Larvae in bottle: Immediate release is important because larvae will cannibalize. Simply disperse evenly with carrier over the leaf material in your grow space.
- 4) Larvae in Hexcel: Immediate release is important because larvae will cannibalize. Promptly disperse larvae throughout the greenhouse.
- 5) Adults in tube: Simply walk through grow space and allow the adults to fly out of the cup container.

Encarsia formosa

Encarsia formosa for whitefly control come on cards, with 1000 pupae per card. The cards will need to be torn into sections and distributed throughout the greenhouse or growing area and hung as close to the plant foliage is best.

Approximate release rate is 1-20 parasites per 10 sq. ft. rates will vary depending on temperatures, season, pest populations, and crop species.

Distribute ASAP, however, if there is a delay, store out of direct sun in a cool location. Leave cards for 20 days to ensure full emergence.

Stratiolaelaps scimitis& *Dalotia coriaria*:

“Strat mites” come in two forms:

- 1) Liter bottle
- 2) Bags with scoops.

Product should be applied over soil surface upon receiving. Wait to apply water to soil for at least 2 hours after release. Before release, rotate the tube to distribute the mites throughout the bottle amongst the carrier. Consider releasing onto potential breeding areas that may be harboring soil dwelling pests, such as gravel or soil greenhouse floors, fabric ground covers, weedy areas, benches, etc. Prompt release is preferred for pique quality, but if necessary, containers can be stored at room temperature (50-60 degrees) on their sides out of direct sunlight for one week.

Approximate release rates are 1 liter per 1000 ft sq., however, rates will vary depending on temperatures, season, pest populations, and crop species. Please call us for further info. regarding releases.

Stethorus punctillum

Stethorus beetles should be released the same day they are received. It is helpful to mist the foliage of the plants before releasing. Open the bottle and tap on infested plants focusing on hot spots. If beetles remain on the paper strips inside the bottle, simply remove the strips to disperse the remaining Stethorus around the grow space.



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Applying Sierra Biological Nematodes

General Information:

Sponges should arrive cooled. Refrigerate until use.

General greenhouse rate is 1 mil per 1000 sf.

Nematodes are available in a variety of sizes (1 mil, 6 mil, 24 mil, 48 mil).

Try to order only what you can use in 1-3 weeks time for best results.

You can cut the sponges in pieces, but you will want to make sure that the white colored solution is evenly distributed before doing so. Those are the areas where the bulk of the nematodes were harvested into the sponge.

This is a very live, fresh product and may smell a little like the dead wax worms that the nematodes were reared on, which is not an issue.

How to apply:

High volume, low-pressure sprayers work best. Simple backpack sprayers are not preferred.

You can use a watering can, injector, or conventional spray equipment. Remember that water is your CARRIER and vehicle to get the nematodes to where ***you want them to be!***

Dipping plug trays into solution also is okay. Boom irrigation and watering tunnels can also be made to work, as long as they **do not exceed 200 psi.**

Remove all intake injectors and openings smaller than **.5 mm and all filters less than 50 mesh or finer.**

Do not mix nematodes in a concentrated tank of feed solution. Nematodes can, however, be mixed in a reservoir with a fertilizer solution.

Volume of water used depends on how large your container size is and where the target pest is dwelling in the substrate. Using room temperature water (65-75 degrees F) is best

Keep the stock nematode tank stirred and/or aerated. If you cannot aerate the reservoir of solution, periodically stop and stir the solution so that the nematodes remain suspended in solution.