Application Instructions for Fungus Gnat & Western Flower Thrips

NemaShield® Sf *In vivo*

NemaShield® Sf *In vivo* contains the beneficial nematode *Steinernema feltiae.* It is ideally suited for the control of fungus gnat larvae (*Bradysia* spp.) and thrips species that spend a portion of their life cycle in the soil or potting media. To prevent severe infestations, NemaShield Sf *In vivo* should be applied at the first sign of pests or when pest pressure is still low. NemaShield Sf *In vivo* is available in 24, 6 and 1 million nematodes per unit.

Rate for fungus gnat larvae and thrips:	Coverage per 24 million nematode unit:
Light infestation	24,000 ft^2
Heavy infestation	12,000 ft^2

Drench application volume: 30-50 gallons/1,000 ft^2

NemaShield Sf *In vivo* users can expect several differences compared to the original NemaShield:

- Nematodes produced from a live insect host (*in vivo*).
- Shelf life: 1-2 weeks upon receipt.
- Sponge carrier: pure nematode culture (no inerts) can be used in organic production systems.
- Lower application rates compared to original NemaShield:
    - NemaShield Sf *In vivo* nematodes are more host efficient which means they search, recognize, penetrate, and kill insect hosts at lower use rates compared to *in vitro* produced nematodes.

How to extract nematodes from the sponge:

1. Remove sponge from plastic packaging and rinse packaging to remove loose nematodes.
2. Submerge sponge in a 5-gallon bucket with cool clean water.
3. Squeeze sponge 3-4 times while moving the sponge around in the water.
4. Squeeze sponge to remove excess water, discard sponge.
5. Constantly agitate the nematode solution during mixing and application.

Application guidelines:

The following instructions pertain to applications of NemaShield Sf *In vivo* to the potting medium.

- Potting media should be moist when nematodes are applied.
- Add a wetting agent or surfactant if desired to enhance the wetting ability of the spray mix and encourage nematode movement.
- Wet the surface of the soil media evenly with the spray containing nematodes.
- Do not apply in direct sunlight (UV light is highly damaging to nematodes).
- Ensure that the potting media remains moist for 2 weeks after application.
    - Potting media moisture content must be high for nematode movement.
- Apply when soil temperature is 50-86 °F. Optimum temperature is 74 °F.

Re-application Interval:

Treat the entire house or plant inventory as soon as insect pests appear. Re-apply at 5 – 21 day intervals depending on insect population density.

100 Rawson Road, Suite 205, Victor, NY 14564
phone: (800) 877-9443 web: bioworksinc.com

Preparation for use:

- Put the contents of the sponge into a bucket containing at least 1-gallon cool clean water.
- **For Sprayers:** Pour entire contents of bucket into a partly filled spray tank. Add the amount of water required to meet the desired rate recommendation. Maintain constant agitation.
- **For Injectors:** Set the injector ratio to 1:100, maintain constant agitation.
- Use at least 3 gallons water/100 ft^2 of treated area.
- Apply nematode solution within 2 hours after mixing.
- Ensure nematode solution stays cool throughout the application process.
- Wash hands following preparations.

Dip application:

- Mix 1 million nematodes in 2 –3 gallons of water.
- Mix 6 million nematodes in 12-13 gallons of water.
- Dip vegetative or hardwood cuttings prior to planting into rooting substrate. Place unrooted cuttings in a mesh bag, immersion tray with lid, or loose in the tank. Ensure that the cuttings are not packed too tightly to promote maximum surface area coverage. Immerse the cuttings completely, gently moving the tray, bag, or plants around in the solution for at least 5 seconds to allow the solution to completely wet all surfaces. Verify that there are no dry surface areas. After dipping vegetative cuttings, keep them cool and shaded. Avoid exposing dipped cuttings to full sun, high temperature, or other stress.
- Dip trays of plugs, individual pots of liners, or other potted young plants into the suspension and gently move around for at least 5 seconds. Ensure that all surfaces have been wetted. Allow plants to dry before watering.
- For additional dipping guidelines see our Utilizing Dips: Clean Up Incoming Plant Material .

Application considerations:

- Use with a pressure sprayer, injector, hose-end sprayer, irrigation, hand-held backpack sprayer, or watering can.
- DO NOT exceed 300 psi.
- Remove all in-line and nozzle filters (50-mesh or finer), and screens on the intake tube, or replace the tubing without a filter. Remove pump filters.
- Set sprayer at a coarse setting; use spray nozzle openings of at least 0.5 mm (35-mesh).
- Maintain continuous agitation to prevent nematodes from settling out. When providing agitation via recirculation pump, ensure the pump does not heat up nematode solution.
- Irrigate prior to application to ensure moist soil. Lightly irrigate plants again immediately following application but not to the point of runoff from the tops of pots/liners or to the point of leaching from the drain holes.
- For optimum results, apply at dusk, especially for outdoor plants.
- NemaShield Sf *In vivo* does not kill fungus gnat adults or eggs.

Compatibility:

See the NemaShield Product Compatibility Chart for products compatible in a tank mix.

Storage:

- NemaShield Sf *In vivo* should be applied immediately upon receipt. If short-term storage is necessary, refrigerate at 41 °F (5 °C).
- Refrigerated NemaShield Sf *In vivo* will retain viability for 1-2 weeks after delivery.
- DO NOT FREEZE

Additional technical information is available on our website (www.bioworksinc.com) or from your BioWorks Biological Solutions Advisor. Always read and follow label instructions.

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