



retaliate-bn
BENEFICIAL NEMATODES

For Organic Use

 **PRECISELY TARGET PESTS
WITH RETALIATE/BN**

Asymmetry's Retaliate B/N series of products are a specific range of **Beneficial Nematodes** species.

These species, known as Entomopathogenic Nematodes or EPNs, have a life cycle comprised of the egg stage, four juvenile stages, and the adult stage. These EPNs have a free-living third stage juvenile (J3), termed a dauer juvenile, that is, the infective stage and is therefore also called an IJ. These IJs harbor a symbiotic bacterium that plays an essential role in subsequent stages of the life cycle.

EPNs mortality to insects is a three-step process.

Firstly, the nematode must migrate, searching for the target host.

Secondly, upon contact with the host, it must penetrate through natural body openings, such as the anus, mouth, and/or through the cuticle.

Finally, the nematode-bacteria complex should be able to overcome the insect's immune system and multiply, producing new generations of IJs.

The nematodes infect insects and inject the bacteria into their hemolymph (circulatory fluid). Therefore the bacteria multiply and produce a range of low-molecular-weight compounds and insecticidal proteins. Insect usually dies within 48-72 hours and serves the nematodes as nutrient source and habitat for reproduction. After acquisition of new endosymbionts, the nematodes leave their host to search for other prey.



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RETALIATE - BN/HB

TARGETS GRUBS

Nematode Species

Heterorhabditis bacteriophora

Symbiotic Bacteria

Photorhabdus luminescens

Foraging Characteristics

Active 'cruiser' strategy to locate and infect sedentary insects. Possess a dorsal tooth in the anterior region of head, which helps them to gain entry

Temperature Range

Active at temperatures of 55 - 90F

Primary Pests Controlled

White Grubs, including European Chafer Grub (*Rhizotrogus majalis*), Japanese Beetle Grub (*Popillia japonica*) and the Oriental Beetle Grub (*Exomala orientalis*).

Tray Concentration

1 tray contains 1.5 Billion juvenile (IJ) *H. bacteriophora* **OR** 1 tray contains 500 Million juvenile (IJ) *H. bacteriophora*. 2 sleeves per tray

Dosage Recommendation:

1.5 Billion Trays

- European Chafer Grub – designed for 1-5 acre treatment.
- Oriental & Japanese Beetle Grub – designed for, 3-7 acre treatment.

Dosage Recommendation:

500 Million Trays

- European Chafer Grub – designed for .25-1.5 acre treatment.
- Oriental & Japanese Beetle Grub – designed for 1-2.25 acre treatment.

Shelf Life

4 weeks. Unopened tray. Keep refrigerated.

Other pests controlled:

- Asparagus beetle (*C. asparagi*); *C. duodecimpunctata* • Banana Weevil (*C. sordidus*) Billbug weevils (*S. parvulus*)
- Carrot Weevil (*L. oregonensis*)
- Colorado Potato Beetle (*L. decemlineata*) • Corn Rootworm (*D. virgifera*) • Cucumber Beetle (*D. undecimpunctata howardi*) • Flea Beetles (*Altica spp*) • Fuller Rose Beetle (*Asynonchus spp*) • Gall Midges (*Oxycoccina*) • Iris borer (*M. onusta*)
- Scarabs (*Scarabaeidae*) • Sugarcane Stalk Borer (*D. saccharalis*) • Sweet Potato Weevil (*C. formicarius*)

Dosages vary depending on pest species, infestation levels, and environmental factors. Consult your Account representative for pest specific dosages. Does not control the adult or egg stage of targeted insects.

Directions

- Follow directions for crop and nematode species dosages.
- Pre-irrigate soil if necessary to achieve uniform soil moisture and cool irrigation lines.
- Calibrate injection pump to evenly distribute Retaliate BN.
- Irrigate for 15-30 minutes prior to starting treatment to cool lines and establish a wetting pattern under plants.
- Add Retaliate BN to container containing no less than 5 gallons of water (temp should be 40-85F), stir contents, let sit for 5 minutes and mix again.
- Empty bucket into injection tank and add sufficient water.
- Irrigate after application with 0.5-1 inch of water.

Best Practices

- Store nematodes cool: 38°F/3°C until ready for use.
- Do not Subdivide. Once opened, use entire tray immediately.
- Store unopened. Follow product specific shelf life. Do not freeze.
- Allow packages to come to room temperature before mixing.
- Do not apply nematicide within 2 weeks before or after application.
- Avoid direct sunlight. Apply early morning or evening.
- Apply mixed solution as soon as possible. Do not leave nematode/water mixture sitting for more than 2 hours. Not aquatic nematodes.
- Remove all fine filters (<50 mesh).
- Ideal injection pressure is ~200 psi or below. Do not exceed 300 psi
- Maintain proper soil moisture for 2 weeks.
- Nematodes have limited horizontal movement, moving vertically in soil until they find a pest. Thorough coverage of the area is important for achieving control.



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