

# Millenium<sup>®</sup>

## Advanced Biocontrol for Peachtree Borer

Millenium<sup>®</sup> is a proprietary formulation of the naturally occurring insect-parasitic nematode, *Steinernema carpocapsae*. 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.

Millenium is active against larval stages of the peachtree borer (*Synanthedon exitiosa*) as well as the larval stages of the codling moth, cranberry girdler, dogwood borer, and other clearwing borer species. Millenium quickly controls pest larvae at the time of application and is persistent in the soil, providing prolonged protection against pest re-infestation. With no restricted entry interval (REI = 0) and no adverse effects on beneficial insects and soil microorganisms, Millenium is ideally suited for use in integrated pest management programs as an important tool for resistance management, worker safety, and environmental responsibility.

### Peachtree Borer Natural History and Life Cycle

Native to North America, the peachtree borer is a major pest of peaches, nectarine, plum, cherry, apricot, and almonds. Adults are clearwing moths that have a superficial resemblance to wasps. Male moths have several narrow bands of white or yellow around the abdomen and are slightly smaller than females displaying a very distinctive orange band on the abdomen. Moth flight depends on locality and can range from late spring to early fall with eggs laid on tree trunks and debris near the base of the trunk. Eggs hatch in 8-14 days, depending on temperature, and hatched larvae bore into tree trunks at or below the soil line to feed. After larvae feed all summer, they will move down to the base of the tree to overwinter. Larvae can overwinter as first through fourth instars. Larvae resume feeding in the spring when soil temperatures reach 50°F and will pupate in late spring to early summer. Pupae usually are found in the top layer of the soil, within a few inches of the host tree. Pupae take 2 to 4 weeks to develop, depending on temperature. Peachtree borers only have one generation per year.

(Continued)



Peachtree borer larva. <sup>1</sup>



Male (left) and female (right) peachtree borers. <sup>2</sup>

## Peachtree Borer Damage

Peachtree borer larvae primarily attack tree trunks just at or below the soil line, but may enter trunks up to 12 inches above the ground. Larvae tunnel between the inner bark and sapwood in the cambium, often girdling and killing young trees in one season. Older trees may withstand the damage, but will be predisposed to attack by other insects and diseases, and can be killed after several years of infestation. Visual symptoms include dead bark peeling off of damaged areas and masses of gummy sap mixed with sawdust and frass exuding from entry and exit holes. Leaves of affected limbs will turn yellow and wilt and the tree canopy will eventually die back. Determine the timing of first adult emergence with pheromone traps or consult your local extension agent for appropriate times to monitor for pest infestations.

## Application Details

### Apply nematodes in the spring and/or fall to target larvae in tree trunks and

**surrounding soil:** Mix 1 tray of Millenium® in 200 gallons of water. Using a high volume single nozzle hand gun applicator, apply Millenium at a rate of 1.25 million nematodes per tree. Apply in an application volume of no less than 100 gallons per acre or at least one gallon to the base of each tree covering an area of 2 feet in diameter. Keep soil moist for 10-14 days.

**Applications should be made when soil temperatures are above 57°F (14°C) and at least one week after application.**

Optimum results are achieved when nematodes are applied to moist trees/soil in the evening to avoid direct sunlight and desiccation. Optimum soil temperatures are between 57 to 86 °F (14-30 °C). Remove all filters of 50 mesh or finer and maintain pump pressure below 300 psi to avoid damaging nematodes.

**WARNING:** Do not use with piston pumps, internal pressure can exceed 300 psi.



Peachtree Borer Damage at Tree Base <sup>2</sup>

<sup>1</sup> Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org

<sup>2</sup> H C Ellis, University of Georgia, Bugwood.org