

# Millenium®

## Biocontrol for Chinch Bugs

Millenium® is a proprietary formulation of the naturally occurring insect-parasitic nematode *Steinernema carpocapsae* that searches out and enters insect pests. Once inside, nematodes release symbiotic bacteria that quickly kill targeted insects. Reproduction inside the insect releases a new generation of infective nematodes that disperse in search of further prey.

Millenium is active against many common turfgrass pests, including billbugs, cutworms, armyworms, sod webworms, and chinch bugs. 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.

### Chinch Bugs in Turfgrass

Chinch bugs are destructive turfgrass pests in many areas of North America. Three closely related species of chinch bugs infest turfgrass. Common chinch bugs are most prevalent in northern Midwestern states, hairy chinch bugs range throughout the Northeast United States and in many regions of Canada, and southern chinch bugs are most common in the Southern United States.

Chinch bugs feed by inserting their mouthparts into turfgrass and sucking sap from leaf tissue. In addition to direct feeding damage, salivary fluids injected during feeding are phytotoxic and limit the movement of water and carbohydrates within the plant. Symptoms of chinch bug feeding include development of irregular patches of stunted, chlorotic turfgrass. These patches eventually change to straw brown as feeding intensifies.

In the Northern United States and Canada, chinch bugs feed on turfgrass throughout the summer, but most damage generally occurs when chinch bug populations peak in July or August during periods of hot, dry weather. In the Southern United States, however, southern chinch bugs may damage turfgrass from late spring to fall. Consult your local extension agent for appropriate times to monitor for pest infestations.

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Chinch bugs prefer to feed in full sun.<sup>1</sup>

When infestations occur, chinch bugs often can be observed near the base of plants and on the soil surface. A hand lens or magnifying glass will be helpful to observe the small insects. An effective tool to determine chinch bug population is the flotation method. Remove the top and bottom lids from a large coffee can (or other similar sized container) and twist one end at least 5 centimeters deep into the soil. Fill the can with water and after ten minutes count the number of chinch bugs that have floated to the surface. Action thresholds will vary by geographical location and grass species present, but typically 25-30 individuals per 0.1 square meter will warrant treatment.

## Application Details

Apply Millenium® at a rate of one billion nematodes per acre when damage is first detected or pest populations exceed action thresholds. Millenium should be applied with a spray adjuvant in a minimum spray volume of 1870 litres per hectare. Remove all sprayer filters and maintain pump pressure below 300 psi to avoid damaging nematodes.

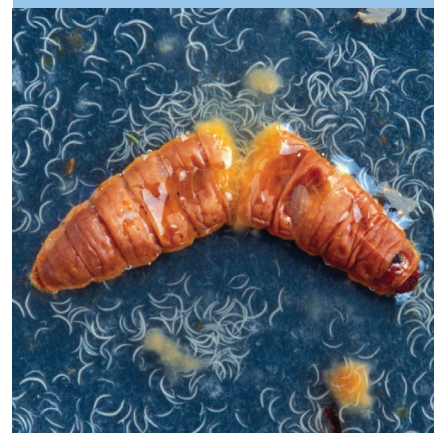
Optimum results are achieved when nematodes are applied to moist soil in early morning or evening to avoid heat and direct sunlight. Irrigation with 6.25-12.5 millimeters of water 24-48 hours prior to application will move chinch bugs closer to the soil surface to maximize contact with Millenium. If soil temperature is higher than 90 °F/ 32°C, irrigate with at least 2.5 millimeters of water to reduce temperature prior to applying Millenium.

Treated areas should be irrigated following application of Millenium to move nematodes into the turf canopy and out of direct sunlight. Irrigation with 2.5 millimeters of water should occur within 30 minutes unless applications were made in dark or overcast conditions during cool, wet weather. Under these conditions, irrigation can be delayed for up to 2 hours.

Turfgrass damaged by chinch bugs often recovers if there is sufficient moisture available. Light fertility and regular irrigation will speed recovery from feeding damage.



Chinch bugs reproduce quickly in hot, dry conditions. <sup>1</sup>



Nematodes surrounding parasitized grub. <sup>2</sup>

<sup>1</sup> Department of Entomology, University of Nebraska-Lincoln.

<sup>2</sup> Peggy Greb, USDA-ARS, [www.ars.usda.gov](http://www.ars.usda.gov).

**Always read and follow label directions.**

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**Millenium**®  
Beneficial Nematodes