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## Control of Chinch Bug Without Pesticides and Other *Ecological Lawncare* Practices

### Facing a Chinch Bug Problem *NOW*?

*This page provides a Quick Guide to diagnosing a chinch bug problem, and how to deal with it.*

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*Looking for chinch bugs*


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## 1. Clues

*It's important to confirm that what looks like chinch bug damage is actually due to chinch bug, as there are other lawn conditions that can cause similar-looking damage.*

In the Maritimes (and most of eastern Canada and the northeastern USA), chinch bug damage is not seen before July, so the time of year in which damage is first observed provides the first clue on whether it is due to chinch bug.

Consider that and other clues by answering these questions:

<ul style="list-style-type: none"> <li>• <b>Did the damage <i>first</i> appear sometime in July or August?</b> (If it appeared earlier, answer NO.) <i>Read about the time of chinch bug damage in <a href="#">Section III MONITORING</a>.</i></li> </ul>	YES	NO	 <p><b>Possible early chinch bug damage</b> on an exposed slope near the curb.</p>
<ul style="list-style-type: none"> <li>• <b>Is the damage restricted to or did it start in <i>the more drought-stressed areas of the lawn</i>, e.g. in sun-exposed areas on slopes, by the curb, borders next to garden beds?</b> <i>Read about water stress as a key factor in <a href="#">SECTION IV FACTORS</a>.</i></li> </ul>	YES	NO	
<ul style="list-style-type: none"> <li>• <b>Did the early damage appear as <i>more or less circular patches of damaged grass that turn yellow and then brown as they die</i>?</b> <i>Read about the appearance and see photos of chinch-damaged grass in <a href="#">Section II BIOLOGY</a> and in <a href="#">Section III MONITORING</a>.</i></li> </ul>	YES	NO	
<ul style="list-style-type: none"> <li>• <b>Do the patches appear to be <i>expanding</i>?</b></li> </ul>	YES	NO	
<ul style="list-style-type: none"> <li>• <b>Is there more than 1/2 inch (13 mm) of <i>thatch</i>?</b> <i>Read about thatch in <a href="#">SECTION IV FACTORS</a>.</i></li> </ul>	YES	NO	
<ul style="list-style-type: none"> <li>• <b>The <i>dead grass does NOT pull up easily</i>.</b> Answer YES if that is true, NO if it is not (i.e., answer NO if it pulls up easily)</li> </ul>	YES	NO	

If the answers to the above were mostly YES, then chinch bugs could be responsible for the damage.

If they were mostly NO, it's not so likely.

Regardless of the answer, you should look for chinch bugs to confirm that the damage is due to chinch bug (or not due to chinch bug).

## 2. Confirmation

- In the morning (before 11 am), get on your hands and knees, part the grass at the junction of dead and living grass at one of the patches, and look for chinch bugs.

Look for flecks of red, which could be the eggs and young nymphs; in August, also look for small bugs scurrying away, some with wings and distinct markings on their backs.



**Young nymphs**, bright red with a white band across the middle, are tiny but not difficult to see.

Read more about looking for chinch bugs in [Section III MONITORING](#).  
See photos of chinch bugs in [Section II BIOLOGY](#).

- Also check a few areas where there is normal grass for comparison.

If you are seeing definite aggregations of chinch bugs at the margins of damaged areas, then its likely you do have a chinch bug problem.

If you don't find any chinch bugs, or only one or two, check at least a half dozen sites to be sure there are few or no chinch bugs and therefore that the dying grass is associated with some other condition, e.g., drought stress alone, summer dormancy, other pests or diseases, dog urine patches, spilled mower gas. See [Other Pests and Diseases](#) for some possibilities.

### 3. Action (What to do about it right away)

Below are some alternatives to conventional pesticides to treat confirmed chinch bug infestation. Because of differences in regulations between Canada and the U.S., more options are available in the U.S.

#### i. **Just Water Option** (Canada, U.S.)

If you had small patches of this sort in the past, and they never developed into larger areas, they probably won't this time either. However to minimize the possibility that the patches will expand, keep the grass around areas that are damaged and other drought-stressed areas of the lawn well watered through the remaining droughty periods. To further reduce drought stress, mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow which on many home mowers is 2.5 inches or 5 cm. (Chinch bugs like drought-stressed grass). See [CULTURAL CONTROLS](#) for more about mowing.

OR apply the...

#### i. **Vacuumping Option** (Canada, U.S.)

Get your Shop-Vac (or similar workshop type vacuum) out and vacuum the affected patches and the surrounding grass to 2 feet (61 cm) beyond the patch. Follow this by watering the damaged areas and their immediate environs through the remaining droughty periods to minimize water stress on the grass, and mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow. Read about use of the vacuum under [ACUTE CONTROLS](#).

OR use the...

#### i. **Soap-Trap Option** (Canada, U.S.)

The PMRA (Canada's Pesticide Management Regulatory Agency) advises the following method, which makes use of a 0.3% soap solution, as a kind of combined monitoring/physical control method:

Put 30 mL (1 oz) of dishwashing soap in 7 L water and drench a small area of lawn, i.e., 0.2 m<sup>2</sup> (2 ft<sup>2</sup>). A larger area of lawn can be treated by using a hose attachment. The chinch bugs will crawl to the surface of the grass to escape the soap.

Lay a flannel sheet over the treated area and wait 10 — 15 minutes. The chinch bugs will crawl onto the sheet, where their feet will become trapped in the flannel nap. They can be vacuumed off the sheet or drowned in a bucket. (See more

details at <http://www.hc-sc.gc.ca/pmra-arla/english/consum/chinchbugs-e.html#8>)

Follow this by watering the damaged areas and their immediate environs through the remaining droughty periods to minimize water stress on the grass, and mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow.

Vacuuming and dish soap trap methods are best conducted when damage is just beginning to occur as the chinch bugs are still congregated in specific locations and can be efficiently collected.

OR, *in the U.S.* use...

i. **Insecticidal Soap Option** (U.S. only)

*Insecticidal Soap is approved for use against chinch bug in the U.S. It is available in Canada for use against certain other pests (e.g., aphids, mealy bugs, earwigs) but has not been approved by the PMRA for use on chinch bug.*

Ecological landscaper Michael Talbot advises to drench the thatch layer thoroughly with insecticidal soap (2% concentration) every 3 to 4 days for two weeks. Less frequent applications (e.g., once weekly) over several weeks may be satisfactory; don't make the intervals between application less than 3 to 4 days.

Apply the soap early in the day or early evening; avoid mid-day under direct sun. Water the damaged areas and their immediate environs through the remaining droughty periods to minimize water stress on the grass, and mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow.

*Read more about the Soap Option under [ACUTE CONTROLS](#) and [More About Soaps, Detergents and Insecticidal Soaps](#).*

OR *in place of insecticidal soap, in Canada individuals (but not landscaping companies) may use...*

v. **Household Soap Option** (Canada?, U.S.)

Traditional, *pure* soaps are made from fatty acids obtained from animal fats and plant oils. In *insecticidal* soaps, certain types of fatty acids have been selected and concentrated in order to increase effectiveness of the soap against pests and to minimize adverse effects on plants; otherwise these soaps are no different from traditional, pure soaps. Unfortunately, while insecticidal soaps are available in Canada, they are NOT approved for use against chinch bugs on lawns. However, the PMRA has recently declared that *individuals* (but not landscaping or pest control professionals) may use *household* soaps for control of pests. This is a little more complicated than using insecticidal soaps because of the wide range and variable nature of modern household soaps (which include detergents) but at least it is legal.

IPM Alaska offers the following recommendations for using household soap.

Usually insecticidal soaps are used as a 2% solution. If you choose to make your own solution with liquid soap, test it first to make sure it will not damage your plants. One recipe is: one teaspoon of liquid soap such as mild Dove, Pure Ivory Soap, or Dr. Bonners or pure castille soap, per quart of water. Do not use extra strength, grease-cutting, or anti-bacterial soap.

As advised for Insecticidal Soaps, drench the thatch layer thoroughly with insecticidal soap every 3 to 4 days for two weeks. Less frequent applications (e.g., once weekly) over several weeks may be satisfactory; don't make the intervals between application less than 3 to 4 days.

Apply the soap early in the day or early evening; avoid mid-day under direct sun. Water the damaged areas and their immediate environs through the remaining droughty periods to minimize water stress on the grass, and mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow.

*Read more about the Soap Option under [ACUTE CONTROLS](#) and [More About Soaps, Detergents and Insecticidal Soaps](#).*

OR, in the U.S. use...

i. **Diatomaceous Earth Option** (U.S. only)

*Diatomaceous Earth is approved for use against chinch bug in the U.S. It is available in Canada for use against certain other pests, but has not been approved by the PMRA for use on chinch bug.*

Care must be taken distributing this material as the dust can irritate eyes and lungs.

Read [more about using diatomaceous earth](#)

OR, in the U.S. use...

i. **Another Option in the US: Essential Oil Products** (U.S. only)

*These products are not available in Canada.*

In the U.S., products made up of Minimum Risk Materials such as cinnamon and rosemary oils, and Minimum Risk Inerts such as soybean oil are exempt from the U.S. EPA registration requirements for pesticides, although some states still require registration (and they are NOT permitted in Canada). Some of these materials are proving to be effective pesticidal materials, one of which is EcoEXEMPT™ IC, which can be used on chinch. Its active ingredient is Rosemary Oil, 10.0%.

*Read more about use of Essential Oils as pesticides under [ACUTE CONTROLS](#)*

Follow this treatment by watering the damaged areas and their immediate environs through the remaining droughty periods to minimize water stress on the grass, and mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow.

OR, in the U.S. use...

viii. **Another Option in the US: Insecticidal Soap + Neem** (U.S. only)

*Products containing neem for use as a pesticide are not available in Canada.*

Neem oil is an active ingredient of several products cited for chinch control in the U.S. Neem is NOT registered for use in Canada. Its major benefits are that it has little if any toxicity to humans, and on the whole, little effect on natural enemies of pests, but is effective against a wide range of plant-eating pests.

Neem is considered a 'soft' botanical pesticide, which acts more as a suppressant than as a generalized killing agent, and is distinguished from harsh botanical pesticides such as pyrethrin and rotenone.

*Read about neem under [ACUTE CONTROLS](#).*

Follow soap+neem treatment by watering the damaged areas and their immediate environs



through the remaining droughty periods to minimize water stress on the grass, and mow at 3 inches (7.5 cm height), or at the highest setting your mower will allow.

#### 4. The poorest options: PMRA approved Pesticides

*Diazinon and Sevin (carbaryl) are the only pesticides approved by the PMRA for control chinch bugs in lawns. Both pesticides are scheduled for removal from the domestic market in Canada and the U.S. because of health concerns.*

In Canada, only two pesticides are registered for use on chinch bugs on lawns: diazinon (an organophosphate) and Sevin (carbaryl, a carbamate pesticide). They have similar modes of action.<sup>[V47]</sup>

Both organophosphates and carbamates bind cholinesterases and block their action in the hydrolysis of the acetylcholine neurotransmitters, thus acting principally in the parasympathetic and central nervous system.



Diazinon is highly toxic to humans, birds, mammals, honey bees and beneficial insects. Because of concerns about heightened susceptibility and high exposure of children to this pesticide, in 2000 it was scheduled for removal from the domestic market in both Canada and the U.S.; this was to occur in stages with complete removal by the end of 2004.<sup>[V51]</sup> Diazinon was still available in some garden stores in Halifax during the summer of 2004.

Carbaryl, of Bhopal fame, has a number of adverse effects:<sup>[V32]</sup>

Carbaryl is a neurotoxic carbamate insecticide. In humans, acute effects of carbaryl exposure include headaches, nausea, incoordination, and difficulty breathing. Carbaryl can cause a variety of behavioral effects, some of which are relatively long-term. It also suppresses several functions of the immune system. Men exposed to carbaryl have more abnormal sperm and lower sperm counts than unexposed men. In female laboratory animals, exposure to carbaryl has caused a variety of reproductive problems, including birth defects in beagle dogs and increased rate of miscarriages in monkeys. Exposure to carbaryl has been associated with a higher incidence of the cancer non-Hodgkin's lymphoma in farmers and brain cancer in children. Nitrosocarbaryl, formed when carbaryl and nitrites react, is a potent carcinogen. Both carbaryl and nitrosocarbaryl cause genetic damage in some test systems, as does carbaryl's primary breakdown product, 1-naphthol.

It is also acutely toxic to many non-target species including fish, birds, bees frogs and earthworms.

[V33]

In fact because carbaryl is not considered safe for domestic use, like diazinon, it has been planned since 2000 to remove it from the domestic market in both the U.S. and Canada,<sup>[V52]</sup> although firm dates do not appear to have been established.<sup>[V48]</sup>

*Lawns are particularly risky sites to use pesticides because they are sites of regular human activity, and children, who are have heightened sensitivity to pesticides, are the most likely to come into intimate contact with treated turf.*

##### **From a Research Paper on Exposure to Pesticides in the Home**

"Insecticides and herbicides applied outside the home can intrude into indoor living spaces by vapor penetration or

Infants under 6 months appear to be particularly susceptible because they have incompletely developed acetylcholinesterase systems and their immature livers are unable to detoxify these compounds. <sup>[V47]</sup>

spray drift and can be tracked inside by humans and pets. Whether used inside the home or outside on the lawn or garden, pesticides accumulate on indoor surfaces (particularly in carpet dust), in food, on dinnerware, and on children's toys, where they may present exposure risks to humans, especially small children." *R.G. Lewis et al.* 1991 <sup>[V49]</sup>

Further, pesticides accumulate in the thatch layer of lawns where they are picked up on shoes and subsequently carried into residences and onto carpets.

Vacuuming is not efficient in removing the pesticide residues from carpets, and the residues do not break down in the dry, biologically sterile environment of carpets so they tend to accumulate to high levels there. It is children and particularly babies who have the greatest contact with pesticide residues in this environment.

#### Physicians' Advice

"Given the wide range of commonly used home and garden products associated with health effects, the College's overall message to patients is to **avoid exposure to all pesticides whenever and wherever possible**. This includes reducing both occupational exposures, as well as lower level exposures that occur from the use of pesticides in homes, gardens and public green space."  
*Ontario College of Family Physicians* [Press Release](#) April 23, 2004.

If you feel that diazinon or Sevin must be used, and use in HRM is approved through the [pesticide permit application process](#), ensure that the pesticide is applied only to the affected areas. We encourage you to make special efforts to keep children and pets out of these areas for at least several weeks, e.g., by placing a string fence around the area and posting a prominent warning sign.

In the U.S., where a wide variety of non-hazardous alternatives to diazinon and Sevin can be used, as outlined above, there would seem to be no need to resort to Sevin or similarly hazardous pesticides.

In Canada, we are severely restricted in our access or legal right to use more benign alternatives such as soap, essential oil, and neem products that can be used in the U.S., which narrows the options.\* Regardless, property owners or

managers in this situation are encouraged to pursue the cited alternatives to diazinon or Sevin, including vacuuming, household soap, higher mowing, regular watering and undertaking a long term plan to deal with chinch bug (discussed below).

\*Compared to the U.S. Environmental Protection Agency, the Canadian Pest Management Review Agency (PMRA) has moved at glacial pace to accommodate a new generation of alternatives to traditional pesticides, despite urging by physicians, MPs, farmers, researchers, vendors and others to move more quickly.

## 5. Why not Pyrethrins?

Pyrethrins are botanical pesticides obtained from the *Pyrethrum* daisy. *Pyrethroids* are synthetic pesticides which resemble pyrethrins chemically, but are stronger and more persistent in the environment.

In the U.S.A, soap+pyrethrin products are approved for use on chinch bug. Pyrethrins are classified as a Permitted Pesticide under the HRM By-Law [Administrative Order No. 23](#).\* However, in Canada they are NOT registered for use on chinch bug.

Pyrethrins and pyrethroids are widely used in the home environment, however users should be aware of two major drawbacks:

- Pyrethrins and pyrethroids have broad spectrum activity and kill beneficial organisms as well as the target pests; they are extremely toxic to bees, fish, and other aquatic animals, and even have negative effects on some soil microbes.

- With piperonyl buyoxide (PBO), another natural product commonly included with pyrethrins, pyrethrins and pyrethroids are a common cause of insecticide poisonings in humans and they are strong allergens. Adverse effects on the nervous system, eyes, blood, kidneys and reproductive systems have been reported as well as carcinogenic activity. Cats are particularly sensitive because they have low levels of the enzymes that detoxify pyrethrins.

See [About Pyrethrum/Pyrethrins](#) for more details.

\* The status of pyrethrins under the HRM By-law is hazy. Pyrethrins are permitted, however pyrethroids (synthetic pyrethrins) are NOT permitted under Administrative Order No. 23, nor is PBO, a product commonly included with pyrethrins or pyrethroids. To further complicate matters, pyrethrin products apparently commonly contain synthetic contaminants.<sup>[V50]</sup>

## 6. Truly Sustainable Solutions

Pesticides do not get rid of chinch bugs, they only control them for a limited period of time. If nothing else is done, chinch bugs will be back next year. That's the bad news. The good news is that the chinch bug can be completely and sustainably controlled by manipulating the cultural conditions of the lawn.

Consider the following questions and the comments when the answer to a question is YES.



*Simple innovations, such as placing a small garden bed in an area of chronic chinch bug damage or introducing a shade bush, can often solve chinch bug problems.*

- **Are there some sun exposed areas where your lawn is established over very shallow soil, rock outcrops etc., or was only a thin layer of topsoil laid down when the lawn was constructed?** If the answer is YES, give extra attention to watering ([CULTURAL CONTROLS](#)); mow higher to reduce water stress ([CULTURAL CONTROLS](#)); plant shade vegetation and/or replace the most drought stressed areas with a garden bed or shrub and/or add topsoil or renovate soil in thin soil areas where you want to retain grass ([REDESIGN](#))

**Do you fertilize several times per year?** If YES, some savings are almost certainly possible. High fertilizer use favors accumulation of excess thatch (which is habitat for chinch), and increases the thirst of grass for water, making it prone to water stress; see [CULTURAL CONTROLS](#) on reducing fertilizer use. Also diversify the grasses to include grass types that are less nitrogen-demanding ([REDESIGN](#)).

- **Do you water the lawn, but not faithfully, or do it frequently for short intervals?** If YES, that could be a factor actually stimulating water stress and chinch bug. You can choose not to water a lawn at all or rarely, but if you choose to water it to 'keep it green', its important that it is done properly. (See [CULTURAL CONTROLS](#))
- **Do you mow shorter than 2.5 inches during the summer?** This is a big factor in water stress, which encourages chinch bug. (See [CULTURAL CONTROLS](#))
- **Was your lawn recently established from Kentucky bluegrass sod?** Most or all sod sold locally is 80 to 100% Kentucky bluegrass, and should be diversified to reduce demands for water and fertilizer, and to reduce thatch problems. (See [REDESIGN](#))
- **Would you consider clover?** If YES, that's great because clover provides possibly the simplest, fastest and cheapest solution to chinch bug problems. When clover is overseeded into a lawn, it forms a pleasing blend, saves on fertilizer and water, masks weeds and eliminates most lawn pest problems. (See [REDESIGN](#), and [Establishing White Clover in Lawns](#))



- **Are you buying a new property or installing a new lawn?** If YES, that's the best time to ensure you will have a pest-free, healthy lawn. Lay down at least 8 inches of topsoil, add compost and seed it with a diverse grass mix, or overseed Kentucky bluegrass sod with diverse grasses. (See [REDESIGN](#))

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