

ASK THE EXPERT

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Earthworms and thatch

Problem: Does earthworm activity help prevent thatch problems? (Mich.)

Solution: We get these calls every year. The following article might be useful in understanding the process. It was excerpted by Dr. Douglas L. Caldwell from several research articles by Dr. Dan Potter and others at the University of Kentucky, particularly a report from the *Journal of Economic Entomology* (1990.83-1: 205-11).

Thatch is a tightly intermingled layer of decomposed roots, rhizomes, stolons, plant crowns, stems and organic debris that accumulates between the soil surface and the green vegetation in turfgrass.

Problems associated with excessive thatch include reduced water infiltration and shallow root growth, which increases vulnerability to heat and drought stress and restricts penetration of fertilizers and soil insecticides. Thatch may also encourage insect and disease problems and weed encroachment.

Many invertebrates, including earthworms, are important to plant litter decomposition and nutrient recycling in soils. They enhance decomposition by fragmenting and conditioning plant debris in their guts before further breakdown by micro-organisms.

Earthworms, in particular, affect the chemical and physical composition of soils by pulling down and mixing organic matter into subsurface layers, enriching and humifying the soil with their excreta and disseminating bacteria and fungi.

Dr. Potter summarized his research by stating, "Our results show that earthworms perform a function similar to topdressing by rapidly incorporating soil into the thatch matrix, as well as dispersing organic matter to subsurface layers, and by creating a micro-environment that enhances a microbial decomposition."

Therefore, avoid applying Sevin, Turcam or benomyl to lawns with thatch, as these chemicals are particularly toxic to earthworms. Dylox, Oftanol, Rubigan, Bayleton and 2,4-D have little impact on earthworm populations.

Frosty putting greens

Problem: What happens to make the grass on a putting green die if driven or walked upon while a frost is on the ground? (Va.)

Solution: Without looking at the problem areas and suspected turfgrass, it would be difficult to explain the reasons for turfgrass death. However, turfgrass affected with frost can be severely damaged when driven or walked on due to blades and/or tillers breaking.

Frost causes vegetative parts to become stiff and brittle, and they break easily. This is a stress and can also serve as a potential site for many low-temperature basidiomycete fungi to colonize. Some of these can establish and cause snow mold disease.

Frost injury can also injure or kill the exposed crown. Since the crown is the only perennial part of the grass plant, once it is

damaged the plant may not green up the following spring. I believe this is what is causing the grass to die. Perhaps avoiding the traffic during frost or delaying the traffic until after the frost has been cleared might be helpful.

Two-lined chestnut borers

Problem: A number of our oak trees are showing severe decline and dieback. Some are already dead. We found small holes on the branches and, in some cases, a few slender-bodied insect larvae about 1/2-inch long in zigzagging tunnels in the inner bark. Could you tell me what kind of problems we may be dealing with, and what can be done to manage these? (Mich.)

Solution: From your description, you are probably dealing with the two-lined chestnut borer. However, for positive identification, send representative samples to your local extension service.

The drought of '88 weakened many established plants to diseases and insects. Large oak trees have been severely damaged by borers such as the two-lined chestnut borer. I believe the slender long larvae you have found is related to this borer.

Two-lined chestnut borers primarily attack oaks weakened by drought, defoliation, diseases like anthracnose, and other stresses. Extensive feeding damage by chewing insects like gypsy moth, forest tent caterpillar or cankerworm also can severely weaken and stress the plants. The larvae kill the trees by constructing galleries, primarily in the phloem. Affected trees initially will show wilting and brown leaves in upper parts of the crown. They usually die after two to three years of repeated borer infestation.

Seeing "D"-shaped holes, the adult emergence holes, is a good indication of two-lined chestnut borer activity. When you see these holes and wilting leaves, it is too late.

Quite often, trees may get oak wilt disease caused by fungi because of extensive weakening and stress. It is not uncommon to find both problems on the same tree.

If the problem is related to borers, promptly remove and discard affected trees. Natural control using predators such as woodpeckers to feed on overwintering larvae may be useful. Minimize leaf-chewing activity by using microbial pesticides such as Bt or traditional pesticides such as Sevin. You may practice a cultural approach by using trap trees to attract adult borers. In this case, girdle living trees in spring, preferably the trees already infested. Adults will lay eggs on these, but larvae will die because the trees become very dry. Another method is to cut infested trees in the summer so that the larvae will die due to rapid drying of the cambium.

For positive identification and management guidelines, contact your extension office.

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Mail questions to "Ask the Expert," LANDSCAPE MANAGEMENT, 7500 Old Oak Blvd., Cleveland, OH 44130. Please allow two to three months for an answer to appear in the magazine.