

Managing Earthworm Problems in Turfgrass

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Earthworms have been called the “intestines of the Earth” because of their importance in breaking down plant litter, recycling nutrients, and enriching the topsoil. **Generally, you’ll have much healthier turfgrass where earthworms are abundant.** Their burrowing reduces soil compaction and improves air and water infiltration. Earthworm tunnels may account for two-thirds of the total pore space in soils. Earthworms enrich the soil with their fecal matter, called castings. Their feeding breaks down thatch while mixing topsoil into the thatch layer, enhancing its suitability for turfgrass growth. Thus, earthworms perform a function much like mechanical topdressing. Their activity encourages microbes that further decompose thatch and enhance soil fertility. **Conservation of earthworms is important in lawns and other turf sites where thatch is a concern.**

But on golf fairways, an abundance of earthworms can be too much of a good thing. Mud mounds abound where the earthworms have pushed up castings through the close-mowed grass. Golf carts and mower tires compact these mounds, smothering patches of grass. Golfers’ drives may stop short on worm-softened fairways, and golf balls may be muddied where they land. Mower blades are dulled, and mowers return to the Operations Center caked with mud.

Over the past decade, my research team ran several multi-year field tests to evaluate the effects of turfgrass pesticides on earthworms. My original intent was to help turf managers to avoid killing earthworms, but I’ve since learned that there are two sides to this issue. Indeed, most

of the interest in our earthworm research has been from golf superintendents who were more concerned with suppressing earthworms. Here are some options for managing this problem:

Strictly speaking, turf managers in the United States cannot apply pesticides for earthworm control because no chemicals are labeled for such use. **However, several products will kill a portion of the earthworms as a non-target effect when they are applied for control of insects or diseases listed on their labels.**

According to our research, the insecticides **bendiocarb** (Turcam[®]), **carbaryl** (Sevin[®]), **ethoprop** (Mocap[®]), or **fonofos** (Crusade[®]) are toxic to earthworms. Any of these products, applied at rates labeled for grub control and watered in (1/2 to 1 inch [1.25–2.5 cm] of irrigation), generally will give an 85 to 95% reduction of earthworms. The fungicide thiophanate-methyl (Cleary’s 3336[®]) provides similar suppression. The impact is greatest if the application occurs when the soil is moist and the earthworms are active near the surface. One application often will reduce casting activity for 2 months or longer, not from residual toxicity, but because the earthworms are slow to reproduce or recolonize treated areas.

In England, carbaryl (Twister[®]), and the fungicides carbendazim (Turfclear[®]) and gamma HCH and thiophanate-methyl (CastAway Plus[®]) are registered for “control of earthworm casts.” These products are not labeled for worm control in the United States. Availability and registration of products in other countries varies.

Most earthworm species are intolerant of acidic soils. Application of aluminum sulfate or sulfur to lower the soil pH to 5.8 or less may reduce their populations. 

The Moss Network

James B Beard

Under the leadership of superintendent Frank Dobie of the Sharon Golf Club in Ohio, a group of 18 superintendents from 8 different states, ranging from New Jersey to Pennsylvania to Ohio to Illinois to Nebraska to Arizona, participated in a networking arrangement. The objective was an interchange of information on the relative success of various methods of moss control on putting greens.

Based on an interchange of results from previous control methods that had been attempted, each of the 18 superintendents selected certain chemical control approaches that each was interested in trying during the 1997 growing season. Based on these tests a strong consensus evolved as to the most effective material in controlling moss with minimal damage to bentgrass (*Agrostis* spp.) and annual bluegrass (*Poa annua*) putting green turfs.

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