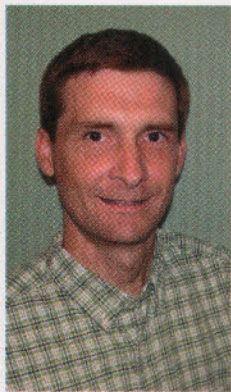


Attack of the earthworms



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I am in charge of our fields at the high school. We have a major problem with earthworms on the football field. It looks terrible; we have all these pits in the soil and a weak root system from the burrowing. Our insecticide program has included Turcam, Seven, and Merit. I have not seen any recovery in 6 years. The field looks good until the end of July/first of August and it's downhill from there.

— South Carolina

This is a fairly common question that does not have a simple answer. There are no labeled insecticides for the control of earthworms. Earthworms are considered to be highly beneficial to the soil ecosystem, although they can be a major nuisance to turf managers.

The small mounds found on the soil surface are called castings. These are soil and fecal matter deposits made by the earthworm when they emerge from their burrows. Moderate earthworm activity often results in excessively soft ground, root desiccation, and turf thinning. The castings can get so bad that closely mown turf can begin to look like tilled ground. It sounds like this is what you are experiencing in late summer.

One study estimates there can be a million earthworms in one acre of land. One mature earthworm can produce several hundred offspring per year and their average lifespan is 6 to 9 years. While feeding on organic matter, they may bring 20 to 25 tons of soil per acre to the surface each year. They are nature's way of aerating soil.

Earthworms can be found in about any soil, although they are less commonly found in sandy soils. They need organic matter as a food source and prefer soils with a pH near neutral. They are most active in moist soils. These are conditions commonly found on athletic fields. Earthworms may retreat deeper into the soil when there is a drought or under frost conditions, only to return when conditions are more favorable.

I noted the insecticides that you have applied to your fields. As I mentioned earlier, there are no pesticides registered for controlling earthworms. Observations have indicated that insecticides carbaryl (Seven) and imidacloprid (Merit) are toxic to the creepy crawlers. In addition the fungicide thiophanate-methyl (several product examples including Cleary's 3336, LESCO's Cavalier, Regal's Systec, etc.) was shown in some tests to provide control. If these products are used in your maintenance program for registered uses, a level of earthworm control may be an added benefit.

You questioned insecticide application timing. I have not seen any data that indicate there is a benefit to certain appli-

cation timing, but I would predict that using these products in your IPM program should include applying them when there is adequate soil moisture present and then watering them into the soil. This is typical application for insects that live in the thatch or upper layer of soil.

Because there are no labeled pesticide controls, several researchers have concentrated on cultural ways of reducing the earthworm castings. There is evidence that they do not like a lower soil pH. The most effective way to lower soil pH is with elemental sulfur. I would not recommend using elemental sulfur unless it is needed as a soil treatment (rather than using it as a pest treatment). If your soil pH is presently in a desirable range for turf growth but you want to try cultural control of earthworms with acidity, then regular use of ammonium sulfate fertilizer may provide some benefit without significant change in soil pH.

Other treatments that have shown to be beneficial in some cases include using angular sand or zeolite soil amendment as a topdressing. Many field managers use sand topdressing as part of their normal cultural practices so you may already know if this activity can benefit you.

If you have compacted soils and excessive thatch, earthworms may actually improve your field. Their burrowing can alleviate soil compaction, initiate thatch decomposition, stimulate microbial activity, and increase plant nutrient availability.

Lastly, my advice would be to practice good cultural practices for growing healthy turf. I suggest using a reasonable fertilizer program to promote turf recovery, followed by a core aeration when the worms are at their worst. If the soil is excessively loose, rolling the field surface can squash their castings and firm the soil around the turfgrass roots to prevent desiccation. ■

