

Q&A with Pamela Sherratt

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Good earthworm, bad earthworm

Q: *Our softball field has a big problem with earthworm castings. It's bumpy and every footprint has at least 10 castings. What a mess! Obviously we have a problem, so my questions to you are: Why did this happen? How do I properly clean this up? How do I prevent this from happening again? AND if this happens on a game day what do I do? Thank you.*

—Terry Day, Dayton, OH

A: **Let me start off by saying that earthworms are wonderful creatures!**

They help decompose organic matter, especially thatch, and play an important role in nutrient recycling. They are our soil aeration tools: improving pore space, root growth, gas exchange, and drainage. They play an important role in the reclamation of compacted soil, they enhance soil microbial activity, and are vital to the soil food web. And if all that isn't cool enough, they have five hearts, can tie themselves in knots and help you catch a fish! So what's not to love about earthworms?

Well as you rightly point out, on an athletic field they can create some problems. The castings create a bumpy, inconsistent playing surface that can adversely influence foot traction and other athletic maneuvers. Ball roll and bounce can also be affected, which is not good for sports like baseball, softball, soccer and field hockey. From an agronomic perspective, if the castings are smeared across the surface, they can reduce surface drainage and on sloped grounds may even be carried away in heavy rain (soil erosion is not a good thing). Castings, rich in phosphorus, are considered mini-seedbeds for weeds like *Poa annua*, and since they contain soil mineral particles can damage mower blades. Last on the list of their wrongdoings, earthworms are the major food source of moles, and may encourage those

pesky varmints onto a field.

Moving on from their pros and cons, let's address your first question: why did this happen? Well, North America has more than 200 species of earthworms that reside in the soil. They range from nearly microscopic to the familiar, larger night crawler, which is probably the culprit on your field. Earthworms create small mounds, called castings, on the soil surface when they emerge and feed at night. The common night crawler is a fairly large species that normally uses a single burrow opening from which it will gather grass clippings, leaves and thatch. The earthworm will extend its head out from the burrow at night to gather this carbohydrate-rich food. The earthworm will ingest the plant material but then excretes its castings (soil mixed with undigested plant remains) around the burrow opening. Since an acre of turf can support more than a million earthworms, the chances of an athletic field containing earthworms and the resulting castings is much greater than not. That's why it happened.

If castings appear on a game day they can be cleaned up by allowing them to dry and then dispersing them, either with a leaf rake (small scale) or drag mat/brush. A light roller might help to even out surface bumps, but be careful not to smear wet castings over the field and make more of a mess. Raising the mowing height slightly may also help, since castings are more apparent on low-cut turf.

How do you prevent this from happening again? Because they play such an important role in soils, I certainly would not recommend attempting to control earthworms in home or commercial turf, but there are definite reasons why sports turf managers may want to reduce earthworm populations. Cultural ways to discourage earthworms include: (1) removing their food source (leaf clippings etc.), and



(2) topdressing with a coarse, angular sand in the spring and fall when they are most active. Topdressing with sand deters them but does not eliminate them. At the very least, the castings are sand-derived and more likely to dry and disperse more quickly, and (3) apply acidifying fertilizers, like ammonium sulfate. These three approaches will not offer complete control, but could reduce the amount of castings to a tolerable level.

No pesticides are registered for controlling earthworms but research has shown that some insecticides, fungicides, fertilizers and detergents kill earthworms or lower their populations, at least temporarily. It's important to note that some of these products, like the detergents, may also cause phytotoxicity on turf. A recently introduced organic fertilizer product called Early Bird 3-0-1 has shown good suppression of earthworms. The fertilizer is derived from tea seed pellets and it acts as an expellant. Early Bird does not have information on its label for earthworm control since it is sold as an organic fertilizer, but research by Chris Williams at the University of Wisconsin has shown 80-95% reduction in castings for about 5 weeks after application.

In summary, it is a challenge to manage earthworms in turf, particularly since they are a mixed blessing. There is no magic bullet to eliminate them, but using the options listed above it should be possible to keep them at an acceptable threshold. Good luck!

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