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# Managing earthworm casts (Oligochaeta: Lumbricidae) in turfgrass using a natural byproduct of tea oil (*Camellia* sp.) manufacture

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## Abstract

**BACKGROUND: Earthworm casts are a worldwide problem on golf courses and sports fields when they disrupt the playability, aesthetics and maintenance of closely mowed playing surfaces. Currently, no pesticides are labeled for earthworms in the United States. Tea seed pellets (TSPs), a saponin-rich byproduct of *Camellia oleifera* Abel oil manufacture, were tested for expelling earthworms and reducing casts on creeping bentgrass turf. The fate of expelled worms, methods for removing them and impacts on pest and beneficial arthropods were also evaluated.**

**RESULTS: Application of TSPs at 2.93 kg 100 $m^{-2}$, followed by irrigation, quickly expelled earthworms from the soil. A single application reduced casts by 80–95% for at least 5 weeks. Mowing or sweeping removed expelled earthworms from putting green surfaces. Most expelled earthworms burrowed down when transferred to untreated turf, but few survived. Bioassay-guided fractionation confirmed the vermicidal activity results from a mix of saponins. TSPs did not reduce the abundance of beneficial soil arthropods, nor did they control black cutworms or white grubs in treated turf.**

**CONCLUSION: TSPs are an effective botanical vermicide that could be useful for selectively managing earthworm casts on closely mowed turfgrass. They might also be used to suppress earthworms in grassy strips alongside runways to reduce bird strike hazard at airports.**