

Long-term fertilization and cultivation impacts on nematode abundance and community structure in tall fescue turfgrass

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Abstract

Impacts of long-term fertilization and cultivation were evaluated on nematode communities associated with tall fescue turfgrass following 11 years of treatment applications. Fertilizer treatments of biosolid, synthetic, and plant-based fertilizers and cultivation treatments of 0x, 1x, and 2x aerification passes were applied to randomized and replicated tall fescue plots at the University of Maryland Paint Branch Turfgrass facility in College Park, Maryland. Free-living and plant-parasitic nematodes were identified, enumerated, and categorized into functional groups. Nematode count data were compared using generalized linear mixed modeling with negative binomial distribution and two-way ANOVA was used to compare nematode ecological indices. Biosolid treatments resulted in lower omnivore-predator densities than plant-based fertilizer treatments ($P[?]0.001$) and significantly greater *Hoplolaimus* densities than plant-based fertilizer plots ($P[?]0.05$). Synthetic fertilizer applications resulted in the greatest *Eucephalobus* ($P[?]0.05$) and total bacterivore densities ($P[?]0.001$) of all fertilizer treatments. Plant-based fertilizer treated plots had the largest Structure Index ($P[?]0.05$). Cultivation of 1x resulted in fewer total bacterivore densities than 2x ($P[?]0.01$) while omnivore-predator densities were greater in 1x than 0x ($P[?]0.001$). Plant health, as measured by NDVI, was lowest in biosolid treated turfgrass ($P[?]0.05$). These findings suggest that long-term turfgrass management practices can have variable impacts on nematode abundance and community structure in tall fescue and provide insights into ecological impacts of turfgrass management practices.

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