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Project Title: Using Carbaryl to Control Earthworm Casting to in Kentucky Bluegrass Enhance Thatch (Biomass) Development

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Introduction:

Earthworms play a vital role in the conditioning of soil. They provide aeration and mixing of the soil and their activity is thought to contribute to mineralization and nutrient uptake by vegetation. One very beneficial aspect of earthworms is their ability to take organic matter from the on top of the soil (dead leaves, thatch, etc.) and take it below the soil surface to break it down for either food or burrow blockage. This process results in athletic fields across the country that are completely devoid of thatch (biomass) material. This layer between the grass and the soil (and possibly slightly into the soil) is thought to provide cushion for the field, protection of the plant crowns, a necessary cover that prevents muddy conditions, and a protective layer that may increase traffic tolerance of certain turfgrass species.

Objectives:

- 1) To determine if Carbaryl (Sevin) will control earthworm populations thereby increasing the level of thatch (biomass) production in established turfgrass systems.
- 2) To determine if different levels of Sevin and nitrogen (in combination) can produce different levels of thatch (biomass) (0, 0.5 and 1 inches of biomass)
- 3) To determine what influence thatch (biomass) level has on wear tolerance, compaction and turf cover in the presence of traffic.

Materials & Methods:

This study was initiated in July 2008 at the Horticulture Research Station north of Ames, IA. The study was set up as a randomized complete block design with a split-split plot arrangement. The main plot factor is made up of two application rates of the insecticide, Carbaryl (Sevin), 1.5 oz/1000 ft², 3.0 oz/1000 ft², and an untreated control. The first split plot factor is two different rates of Urea fertilizer application, 0.5 lbs/1000 ft²/month and 1.0 lbs/1000 ft²/month from April through November, resulting in 4 lbs/1000 ft² for the low rates and 8 lbs/1000 ft² for the high rate. The second split plot factor is three traffic levels, 4 passes/wk, 8 passes/wk, 12 passes/wk, and an untreated control.

Sevin applications began last July and since have been applied at the listed rates 10 days apart, once in the early spring (April) and once in the early autumn (September) to coincide with periods of elevated casting activity. Treatments will continue through the autumn of 2009 when traffic simulation will begin to evaluate mean separation between the split-split plots.

Preliminary Results:

We have yet to officially record thatch measurements as we will record them prior to traffic simulation to note mean separation in treatment levels. However, preliminary investigation shows more substantial thatch accumulation at 3.0 oz/1000 ft² and high fertility (8 lbs. N/yr). We are also investigating methods for measuring thatch/biomass and hope to develop or improve upon current methodology.