Organic Fertilizers—A Risk Factor for Black Turfgrass Ataenius?

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Turfgrass Trends, July-August 2001; Vol. 9, No. 4

Black Turfgrass ataenius (BTA), a small white grub, is a sporadic, severe pest of golf courses in regions where cool-season turfgrasses are grown. Superintendents who normally don't expect to see grub injury until late summer may be surprised to find high densities of BTA grubs damaging fairways, tees, collars, and putting greens in June. My recent research suggests that use of certain organic fertilizers may be a risk factor for this pest.

BTA differs from other turf-infesting grubs in having two generations per year through most of its range. At the latitude of southern Ohio, Kentucky, West Virginia, and Nebraska, damage typically appears about mid- to late June, and again in late summer, coinciding with the first and second broods of grubs. In such areas, the first brood of grubs tends to be more synchronized and destructive than the later generation. More northern regions (e.g., Minnesota, northern New England, and southern Ontario) may have only one generation, with damage appearing in July and August.

BTA belongs to the subfamily Aphodiinae, a group of small scarab beetles, which in natural habitats feed mainly in animal dung or decomposing organic matter. If the females are predisposed to deposit their eggs in manure or compost, then I suspected that they might also be attracted to odors emanating from organic fertilizers.

My two-year study was conducted on a northern Kentucky golf course. Fairways and greens were perennial ryegrass and creeping Bentgrass, respectively. Some putting greens that had been maintained with organic fertilizers had been damaged by BTA in the preceding year. The fairways had a background density of 50 to 100 BTA grubs per square foot, which for this small species is generally too low to produce noticeable damage. For practicality, my tests were done on the fairways.

I evaluated three types of slow-release, granulated organic fertilizers: Milorganite®, which contains organic solids from activated sewage sludge; Nature Safe®, which is made from feather, meat, bone and blood meals; and Sustane®, made from aerobically composted turkey litter. Slow-release urea was included for a nitrogen comparison, along with untreated controls. Fertilizers were applied monthly from April to June at 1 lb N/1000 ft^2 (0.5 kg/100 m^{-2}) per application. Plot size was 3 x 3 m (about 100 ft^2). In the first year, there were 10 replicates per fertilizer across 2 fairways. In 2001, treatments were replicated 15 times across 3 fairways. Adult BTA were monitored with pitfall traps or soap drenches, and first-generation BTA grubs were assessed from soil samples taken in late June or early July.

Two of the three organic fertilizers were associated with statistically higher densities of BTA. In the first year, grubs averaged 98 per square foot in untreated plots, as compared to 140 and 148 with Milorganite® and Nature

Safe®, respectively. In 2001, densities for those treatments averaged 64, 117, and 107 per square foot, respectively. That represents a nearly 1.5-fold and 2-fold increase in 2000 and 2001, respectively. Adult densities, too, were consistently higher in the Milorganite®- or Nature Safe®-treated plots. In contrast, I saw no increase in BTA densities with Sustane® or slow-release urea.

The significant benefits provided by organic fertilizers likely outweigh the drawback that certain ones may increase risk from BTA. Organics are non-burning, have a moderately-slow release rate, and resist leaching. They contain sulfur, iron, and trace elements that may enhance plant metabolism and disease resistance. BTA is a sporadic pest, and many golf courses never see damaging infestations. Still, superintendents who use organic fertilizers should be especially alert for small black BTA adults crawling on fairways or putting greens, or picked up in mowing baskets, and consider preventive management if the pest is abundant.

Also published in Golf Course Management, December 2001

Biology and management of Black Turfgrass Ataenius
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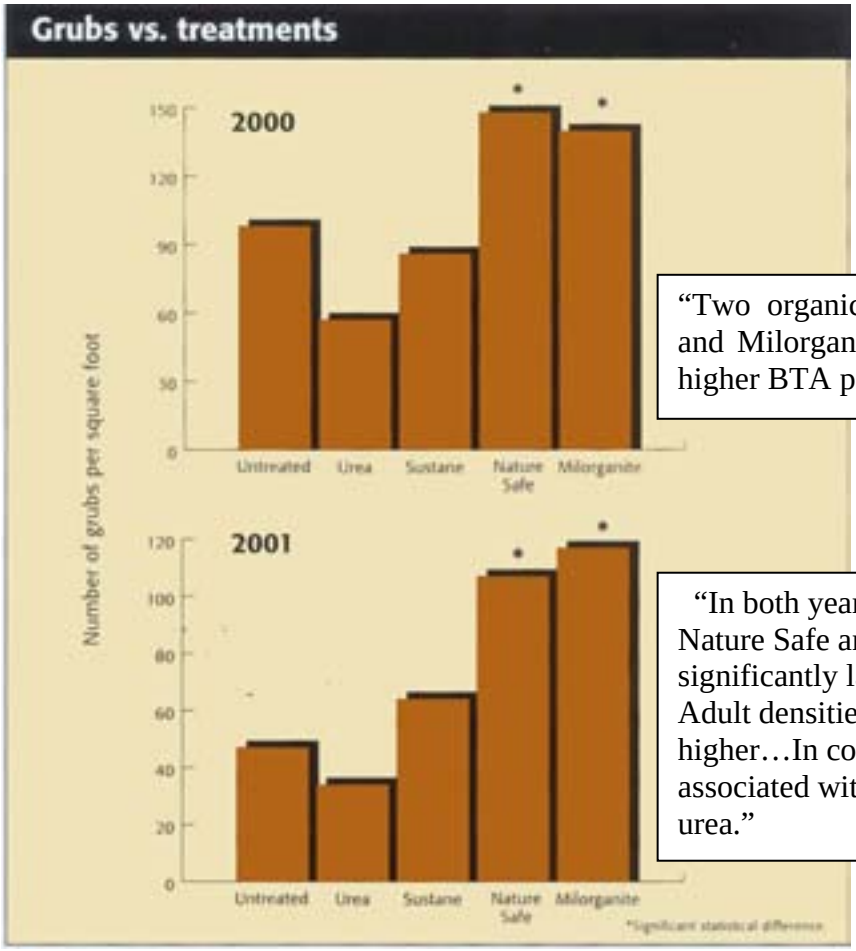

"Two organic fertilizers, Nature Safe and Milorganite, were associated with higher BTA populations…

"In both years, the plots treated with Nature Safe and Milorganite had significantly larger number of grubs. Adult densities, too, tended to be higher…In contrast, no increase was associated with the use of Suståne or urea."