Kansas Agricultural Experiment Station Research Reports

Volume 1
Issue 6 *Turfgrass Research*

Article 11

January 2015

Combined Effects of Topdressing, Cultivation, and Carfentrazone-ethyl on Silvery-Thread Moss Infestation

Z. Raudenbush
Kansas State University, zane12@k-state.edu

S. Keeley
Kansas State University, skeeley@ksu.edu

TURFGRASS RESEARCH
2015

K-STATE TURFGRASS RESEARCH

JULY 2015

Combined Effects of Topdressing, Cultivation, and Carfentrazone-ethyl on Silvery-Thread Moss Infestation

Zane Raudenbush and Steve Keeley

Summary. The greatest reduction in silvery-thread moss (STM; *Bryum argenteum* Hedw.) cover was achieved when cultivation treatments were used in conjunction with carfentrazone.

Rationale. Controlling STM infestations in golf course putting greens can be a difficult task because of STM's unique morphological and biological properties. Additionally, superintendents utilize an array of tools and cultural practices, and these tools often affect the population dynamics of STM in a creeping bentgrass putting green. Applications of carfentrazone-ethyl and sand topdressing have been shown to reduce STM infestation; however, no research has evaluated the effect of cultivation.

Objectives. Determine the effect of cultivation, with and without light, frequent topdressing, and carfentrazone on an existing STM infestation in a creeping bentgrass putting green.

Study Description. A 2-yr field experiment was conducted at the Rocky Ford Turfgrass Research Center in Manhattan, Kansas. Treatments were applied to a 'Penncross' creeping bentgrass (*Agrostis stolonifera* L.) putting green with an existing STM infestation. Three main effects were evaluated: topdressing (2 levels), herbicide (2 levels), and cultivation (4 levels). Treatments were applied to the same plots in both study years because researchers were interested in the cumulative effect, over time, on STM cover. The infrequent topdressing treatment consisted of 2 $yd^3\ acre^{-1}$ of sand applied directly after cultivation treatments, and the frequent treatment consisted of 2 $yd^3\ acre^{-1}$ of sand applied directly after cultivation treatments + 1 $yd^3\ acre^{-1}$ of

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

sand applied every two weeks from May to September in 2013 and 2014. The 3 × 4 ft subplots contained a 4 (cultivation) × 2 (herbicide) factorial. Cultivation treatments were applied during fall and spring of each study year. The four cultivation treatments were: 1) 0.5 in. diameter hollow-tine aerification at low intensity (3.9% surface disruption, SD); 2) 0.5 in hollow-tine aerification at high intensity (7.2% SD); 3) vertislicing; and 4) no cultivation. The herbicide factor contained two levels: 1) carfentrazone applied at 0.1 lb ai acre^{-1} one week before and one week after cultivation treatments were administered (four applications per year), and 2) no herbicide. A rating grid containing 330 intersections was used to determine percent change in STM cover, and data were subjected to analysis using the MIXED procedure in SAS (SAS Software, Version 9.4, 2013, SAS Institute Inc., Cary, North Carolina).

Results. Both vertislicing and 3.9% SD aerification reduced STM cover compared to the untreated control by the end of the study (Figure 1). On average, a 20% reduction in STM cover was observed after two applications of carfentrazone (Figure 2). Topdressing did not significantly affect moss cover ($P < 0.05$) throughout the entire study. Greatest reductions in STM cover will likely be attained by combining cultivation and carfentrazone. Although light, frequent topdressing did not reduce STM cover in our study, other research supports its inclusion as part of a comprehensive STM management strategy.

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

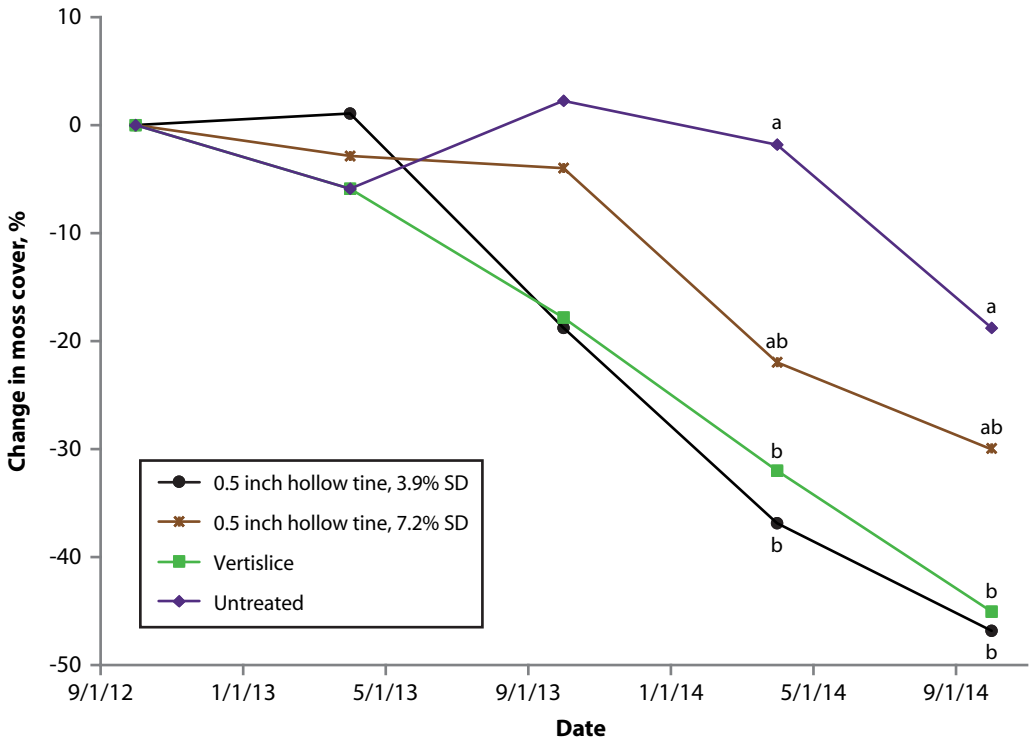

Figure 1. Effect of cultivation treatment on silvery-thread moss cover in a creeping bentgrass putting green in 2013 and 2014. The 3.9% SD and 7.2% SD indicate hollow tine aerification at low and high surface disruption, respectively. Vertislice treatments involved cutting 0.06-inch-wide slits on 2-inch centers to a depth of 0.3 inch in the turfgrass surface. Cultivation treatments were performed each spring and fall starting on October 1, 2012, and ending April 7, 2014. Means followed by the same letter on individual rating dates are not significantly different ($P < 0.05$) according to Fisher's Protected LSD.

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

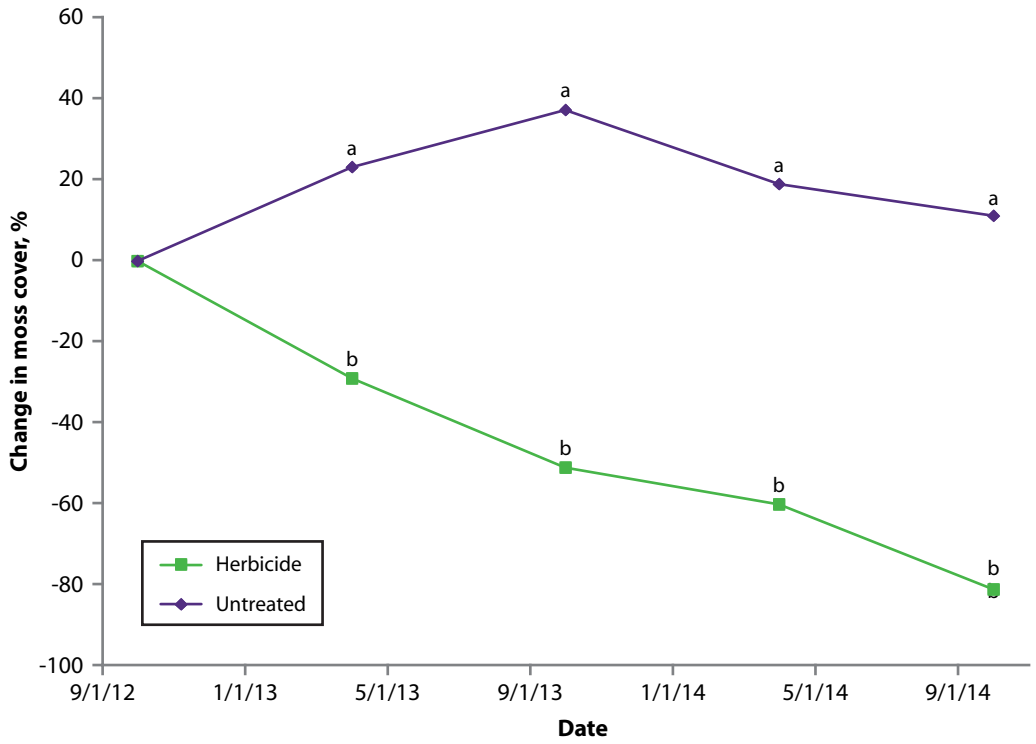

Figure 2. Effect of carfentrazone on silvery-thread moss cover in a creeping bentgrass putting green in 2013 and 2014. Herbicide applications began September 25, 2012, and the last application was April 14, 2014. Each spring and fall a split treatment was applied at 0.1 lb ai acre^{-1}, two weeks apart (four total applications per year). Means followed by the same letter on individual rating dates are not significantly different ($P < 0.05$) according to Fisher's Protected LSD.

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service