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BRIEF

Speedzone has Potential for Postemergence Goosegrass Control in Perennial Ryegrass and Creeping Bentgrass

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GOOSEGRASS (*Eleusine indica* [L.] Gaertn.) is a C4 summer annual distributed throughout the transition zone and can be problematic in sports fields and lawns, but more often is problematic in golf course greens and tees where preemergence (PRE) herbicides are rarely used because of frequent reseeding in-season. The postemergence (POST) herbicides monosodium methanearsonate (MSMA), fenoxaprop-ethyl, or sulfentrazone are commonly used to control goosegrass on golf courses. However, MSMA has recently lost most of its labeled uses (EPA, 2013), while fenoxaprop-ethyl is restricted from use at mowing heights less than 0.25 inch (Anonymous, 2005) and sulfentrazone is restricted from use on golf course greens or tees (Anonymous, 2012).

In July 2011, control of goosegrass was reported when Speedzone was applied to golf course tees to control summer annual broadleaves in Omaha, NE (J. Calentine, personal communication, 2011). This was further reported anecdotally at multiple sites in Nebraska later that summer. Therefore, we began our studies in 2012 with the objectives of confirming if Speedzone has potential for goosegrass control and if so, what application rates and intervals are most effective while still safe on cool-season turfgrasses.

The experiment was conducted in 2012 and 2013 at the John Seaton Anderson Turf Research Facility near Mead, NE. In October of 2011, sand-based thinly cut sod of Kentucky bluegrass (*Poa pratensis*) and perennial ryegrass (*Lolium perenne*) from a tee on a local goosegrass-infested golf course was moved to the experimental site, distributed evenly and tilled into the top inch of soil. Soil type on the experimental area was Tomek silty clay loam (fine, montmorillonitic, mesic Typic Argiudoll) with pH 6.9 and 2.7% organic matter. A perennial ryegrass blend was seeded at 3 lbs/1000 sq ft in April 2012 to establish a thin turf cover. Following establishment, the area was irrigated to prevent water stress, mowed at 0.625 inch, and not fertilized to minimize turf competition with goosegrass. Before goosegrass germination and initiating treatments, glyphosate was applied

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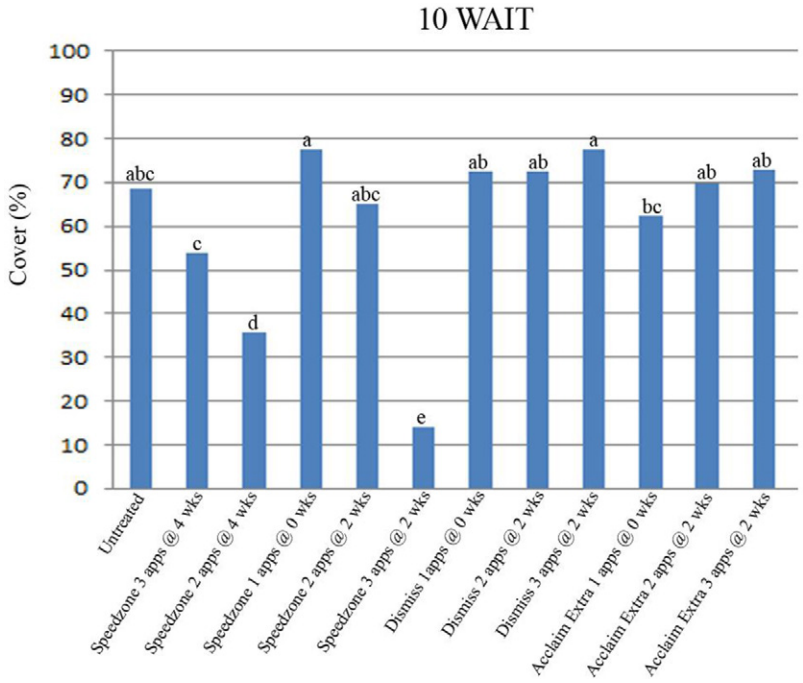

Figure 1. Goosegrass cover rated 10 weeks after initial treatment with various herbicides applied up to three times and at various intervals. Bars with the same letter are not different at $P > 0.05$. Initial treatments made 27 June and 20 June in 2012 and 2013, respectively. Means are combined over two years and three replications per year.

across the site to limit perennial ryegrass and encourage goosegrass. Quinclorac was also applied at 0.75 lb ai/A to control crabgrass postemergence as needed.

Initial herbicides treatments were applied on 27 June 2012 to 2–4 leaf stage goosegrass and included Speedzone (0.62% carfentrazone-ethyl, 28.57% 2-ethylhexyl ester of 2,4-D, 5.88% mecoprop-p acid, 1.71% dicamba acid), Dismiss (39.6% sulfentrazone), and Acclaim Extra (6.59% fenoxaprop-p-ethyl) applied at label rates (64, 4, and 3.5 fl oz/A, respectively). Herbicides were applied one to three times at two- or four-week intervals and an untreated check was included. Herbicides were applied with a CO_2-powered backpack sprayer in 87 gal/A water at 30 PSI, with a spray boom containing three flat fan nozzles (8002VS TeeJet Spraying Systems, Wheaton, IL). Experiment design was a randomized complete block with three replications of 5 x 5 ft plots. Percent goosegrass cover was visually estimated every two weeks after initial treatment (WAIT) on a scale of 0 to 100%, where 0% = no goosegrass cover and 100% = complete goosegrass cover. This study was repeated in 2013 with treatments re-randomized in the same area but immediately adjacent to the 2012 study with initial applications starting 20 June on 2–4 leaf stage goosegrass.

To evaluate turf safety, identical experiments were repeated on separate stands of perennial ryegrass blend or 'L93' creeping bentgrass (*Agrostis stoloniferus*) mowed at 0.625 inch maintained as fairways and 'L93' creeping bentgrass mowed at 0.188 inch maintained as a green. Turf quality and injury were visually rated on a one to nine scale, where 1 = complete plant death and 9 = no turf injury, every two WAIT. All data were analyzed with SAS using the GLIMMIX procedure (SAS Institute, 2011) for generalized linear mixed model analysis to incorporate normally distributed random effects. Treatment means were separated using Fisher's protected least significant difference at $\alpha = 0.05$.

Initial applications of Speedzone decreased goosegrass cover by up to 80% two WAIT compared to the control in 2012 and up to 35% in 2013 (data not shown). However, goosegrass recovered within 14 days after single applications of Speedzone and it appears multiple applications are required for the most effective control. At six WAIT, three applications of Speedzone at two-week intervals reduced cover by 87 and 43% in 2012 and 2013, respectively, compared to the untreated check. Data at 10 WAIT could be combined from both years and Speedzone applied twice, two weeks apart reduced goosegrass cover down to 12% cover compared to the untreated check and many other treatments at >60% cover (Fig. 1). Acclaim Extra or Dismiss did not reduce goosegrass cover compared to the untreated check regardless of application number or frequency. Speedzone did not cause significant phytotoxicity to the turf safety studies, regardless of species, mowing height, year, or number of applications or frequency (data not shown).

Although our findings show most effective goosegrass control with Speedzone applied three times at two-week intervals, applicators are limited to applications every 28 days due to label restrictions of 2-ethylhexyl ester of 2,4-D. Therefore current work is focusing on improving control from applications at four-week intervals as well as evaluating individual components of Speedzone.

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