

Effects of Mowing Height and Traffic on Germination of Dormant-Seeded Bermudagrass in an Overseeded Situation



Photo by Aaron Patton

Arkansas football team practices on Riviera bermudagrass

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Summary. Bermudagrass sport fields in the transition zone are often overseeded during the winter months to provide an actively growing turf while the bermudagrass is dormant. While winter overseeding is a well-accepted practice in the turf industry, there are negative effects to germination with the presence of actively growing turf. Dormant seeding bermudagrass has been shown to be an effective means to renovate areas of the field that have been thinned due to excessive wear and traffic. Unfortunately, the field may still be receiving traffic from play while seedlings are germinating. This project was conducted to investigate how different mowing heights and traffic treatments affect germination of

dormant-seeded bermudagrass. ‘Riviera’ bermudagrass was dormant-seeded into an overseeded perennial ryegrass turf at 1.0 lb pure live seed/1000 ft² on 6 March 2008. Three mowing height treatments and four traffic timing treatments were evaluated for their effects on establishment of the dormant-seeded bermudagrass. Bermudagrass germination and establishment was almost nonexistent in this turf area and was not enhanced by any of the mowing height or traffic treatments. Additional studies associated with this project have demonstrated that ryegrass competition must be removed to successfully establish bermudagrass via dormant seeding.

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Bermudagrass (*Cynodon dactylon*) sports fields are often overseeded with a cool-season turfgrass in the dormant months to maintain a high-quality playing surface with an aesthetically pleasing green color. Perennial ryegrass (*Lolium perenne*) has been the most commonly used turf species for overseeding applications due to its rapid establishment rate, high wear tolerance, ability to tolerate a range of mowing heights, medium to fine texture, and gradual spring transition (Batten et al., 1981; Ward et al., 1974; Schmidt and Shoulders, 1980). While winter overseeding with cool-season grasses is a well-accepted practice, the presence of an actively growing turf presents some limitations that are not conducive to seed germination. Competition for water, nutrients, oxygen and light is the main limitation for germination to occur in an actively growing stand of turf.

For turf managers in the transition zone and southern states, establishing or renovating a field or high-traffic area can be frustrating, as optimal planting periods often coincide with periods of high use. It has been demonstrated that improved cultivars of seeded bermudagrass can be dormant-seeded during the winter (Shaver et al., 2006) and this approach may provide turf managers with an alternative means to renovate damaged areas of turf. Although bermudagrass is well-known for its traffic tolerance at maturity, there has been little work to understand the effect that traffic or wear will have during establishment. Zuk et al. (2005) concluded that trafficking zoysiagrass after seeding reduces zoysiagrass (*Zoysia japonica*) emergence and cover. The objective of this research was to determine the effects of mowing height and traffic on germination and seedling development of dormant-seeded bermudagrass in an overseeded situation.

Materials and Methods

The study was conducted at the University of Arkansas, Agricultural Research and Extension Center in Fayetteville. The site is a simulated, sand-capped athletic field where six inches of

medium-coarse sand has been placed over the native silt loam soil. The area was overseeded with Integra perennial ryegrass at a rate of 12 lb pure live seed/1000 ft² on 12 October 2007. Plots were seeded with Riviera bermudagrass at a seeding rate of 1 lb pure live seed/1000 ft² on 6 March 2008.

Three mowing-height treatments were applied to the area and were consistent with typical mowing heights of sport complexes in the region. The mowing heights were 0.5, 1.0, and 1.5 inch and were replicated three times. Four traffic treatments were applied using a Cady traffic simulator (Henderson et al., 2005). The traffic treatments included: (1) traffic for four weeks before expected germination, (2) traffic for four weeks after expected germination, (3) traffic for four weeks both before and after expected germination, 4) and no traffic.

The plots were seeded on 6 March, which is considered a dormant seeding date. Two weeks after germination, a seedling stand count was determined for the various mowing heights and traffic treatments in a companion study planted at the same site. Small rings were made from three inches in diameter PVC pipe to be tossed four times into each plot. Then, seedlings within each ring were to be counted. Four weeks after germination, percent coverage was determined for that specific treatment. Percent coverage was determined by taking visual assessments, which were then measured against the findings of the grids; however, because germination of bermudagrass was almost nonexistent, neither seedling counts nor percent coverages were used. The experimental design was a strip plot with 3 replications. Plot size for traffic treatments was 5 by 15 ft and for mowing height treatments was 5 by 20 ft.

Results and Discussion

Minimal germination was observed among the plots in this trial and there were no discernable differences between any of the mowing heights and traffic treatments (data not shown). The perennial ryegrass remained competitive

throughout the spring and inhibited germination in all plots. As noted in a companion study, germination of seeded bermudagrass is significantly inhibited by reduced light (Jellicorse et al., 2009b) and establishment could have been enhanced by the use of a selective herbicide such as foramsulfuron (Jellicorse et al., 2009a). The findings from this study suggest that the existing stand of perennial ryegrass must be removed for germination and establishment to occur. Furthermore, reducing the turfgrass canopy by lowering the mowing height to as low as 0.5 inch or by thinning the turf through up to eight weeks of traffic had no effect on germination and establishment of a dormant-seeded bermudagrass.

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