

Tall Fescue Mowing Height Performance under Simulated Traffic

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Introduction

Tall fescue (*Festuca arundinacea*) requires fewer inputs than other cool season grasses such as Kentucky bluegrass. With newer turf-type tall fescue cultivars, more facilities are choosing them over Kentucky bluegrass due to better traffic and drought tolerance. The objective of this study was to determine what height of cut offers the best aesthetic quality and safety, measured by surface hardness, soil moisture, and shear vane rotational resistance. This is the first year of a two-year study.

Materials and Methods

Research is being conducted at the Iowa State University Horticulture Research Station on the Sports Turf Research Area on a native soil rootzone. The experimental design was a randomized complete block with three replications. The mowing height treatments were 1.5-in., 2-in., and 3-in. height of cut. Simulated traffic was applied three times/week with a modified Baldree Traffic Simulator throughout the growing season. Simulated athletic field traffic was initiated at the same time as the Iowa high school football season. The research area received three simulated traffic events/week for nine weeks. Digital images were collected after every traffic event to track turfgrass performance with percent green cover. Percent green cover

was determined using digital image analysis. Surface hardness, soil moisture, and shear vane rotational resistance were collected after every five traffic events. Surface hardness was collected using the 2.25 kg Clegg Impact Soil Tester. Soil Moisture was collected with the FieldScout TDR, and rotational resistance was collected using TurfTec Shear Tester.

Results and Discussion

A significant date-by-treatment interaction was present, so individual dates are presented. No significant differences in surface hardness values were reported throughout the season except for after five simulated traffic events (Table 1). After five simulated traffic events, the 3-in. mowing height offered the lowest surface (72) hardness but was only significantly different from the 2-in. mowing height (79). Shear vane rotational resistance values were similar between treatments on most dates (data not reported). Tall fescue mowed at 1.5-in. offered higher percent green cover on four of the five rating dates (Table 2) than tall fescue mowed at 3-in. All mowing height treatments were above 30 percent cover after 25 simulated traffic events.

This study will be repeated in 2018. Turfgrass recovery after simulated traffic will be tracked March-May of 2018 and 2019.

Acknowledgements

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Table 1. Effect of various tall fescue mowing heights on surface hardness (GMAX) under simulated athletic traffic, 2017

Mowing height ²	Number of simulated traffic events ¹					
	0	5	10	15	20	25
1.5 in	51 ³	78	101	65	75	72
2 in	53	79	99	64	80	72
3 in	52	72	105	60	73	67
LSD (0.05) ⁴	6.4	5	22.4	6.7	12.7	9.9

¹Simulated athletic events applied using a modified Baldree Traffic Simulator starting August 7, 2017.

²Mowing height treatments were applied using a Toro rotary push mower three times/week during the growing season.

³Surface hardness values collected using a 2.25 kg Clegg Impact Soil Tester and units expressed are in GMAX.

⁴Means were separated using Fishers LSD.

Table 2. Effect of various mowing heights for tall fescue on percent green cover under simulated athletic traffic, 2017.

Mowing height ²	Number of simulated traffic events ¹					
	0	5	10	15	20	25
1.5 in	95 ³	97	93	70	68	41
2 in	97	96	90	61	55	32
3 in	97	96	85	59	55	32
LSD (0.05) ⁴	1.8	0.69	5.2	6.9	7.4	11.2

¹Simulated athletic events applied using a modified Baldree Traffic Simulator starting August 7, 2017.

²Mowing height treatments were applied using a Toro rotary push mower three times/week during the growing season.

³Percent green cover as determined with digital image analysis.

⁴Means were separated using Fishers LSD.