

Athletic Field Safety and Performance Study

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Introduction

Athletic field safety is a growing national concern. Recent concerns over the performance safety of synthetic athletic fields has created a new focus on how to maximize the performance and safety of natural grass athletic fields. The objective of this project is to compare various turfgrass species, mixtures, and blends under different fertility rates when subjected to simulated athletic traffic to track the performance and safety of each surface. Additionally, surface hardness will be evaluated with the TruFirm hardness device typically used on golf course putting greens to see if a correlation exists between the TruFirm and Clegg Impact Soil Tester. 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 over native soil root zones. The experimental design is a two by eight factorial design with four replications. Two fertility rates will be used (2

lb of N 1,000ft⁻² and 4 lb of N 1,000ft⁻²) with eight seed mixtures or species (Elite Sports Mix; Snap Back Tall Fescue; Summertime Blues Kentucky bluegrass (KBG); Rush KBG; HGT KBG; Super Turf 1 Tall Fescue; Revolution Mix; and 5 Iron Perennial Ryegrass).

Treatments were applied over the 2016 growing season and simulated traffic will begin in 2017 with the Cady Traffic Simulator (CTS). Two passes with the CTS is the equivalent of 56 cleat marks ft⁻², which is the same number of cleat marks as the highest wear area receives during a football game.

Digital images will be collected with a light box before and after every simulated athletic event to track turfgrass performance with percent green cover. Percent green cover will be determined with Digital Image Analysis. Surface hardness also will be collected before simulated traffic and after every five events to track changes in surface hardness with both the Clegg Impact Soil Tester and the TruFirm hardness device. Soil moisture will be tracked each time surface hardness data is collected, because these two have been closely linked. Testing for possible correlations will be done between the two hardness devices after the data have been collected.

Table 1. Description of species and cultivars used on the Sports Turf Research Plots at the ISU Horticulture Research Station.

Treatment names	Kentucky bluegrass varieties	Perennial ryegrass varieties	Tall fescue varieties
Summer Time Blues	100% Summer Time Blues		
Rush	100% Rush		
HGT	100% Barvette		
Elite Sports Mix	40% Dauntless, Nu Blue Plus, and SR2100	60% Sunrise and Provost	
5 Iron		19.6% Apple SGL, Fastball RGL, Karma, Stellar 3GL, and Wicked	
Snap Back			70% No Net and 30% Summer
Super Turf 1			19.6% Spyder LS, 24.5% Talledaga, Trinity, and Inferno
Revolution Mix			34.5% 2nd Millennium, 25% Traverse SRP, 19.6% Titanium LS, 19.6% Mustang 4