

Comparison of Nitrogen Containing Fertilizers and Tall Fescue (*Festuca arundinacea* Schreb.) Response

Introduction

Land managers have used nitrogen containing fertilizers to increase the overall health and vigor of turfgrass species. One of the potential benefits of a fertilized, and therefore healthier and thicker, stand of turf is the possibility of the turf to outcompete broadleaf weed species and therefore reduce the need for herbicide applications. There are several formulations and concentrations of nitrogen containing fertilizers on the market. Research has shown that, regardless of packaged concentration, an application of 1 lb of nitrogen per 1000 ft² should be the standard application rate.

Along with the standard commercial formulations of fertilizer readily available in the marketplace today, the Louisville / Jefferson County Municipal Sewer District has been formulating biosolids into a packaged nitrogen containing fertilizer called Louisville Green. When wastewater is treated, two of the results are clean water and organic solids. These organic solids can be further processed into fertilizer. Louisville Green is a 5-3-0 slow release pelletized fertilizer available in bulk and 40 lb bags. A trial was initiated to compare the effect 2 common fertilizer formulations and Louisville Green on tall fescue.

Methods and Materials

The study was located at the University of Kentucky Agricultural Experiment Station Spindletop Farm in Lexington, KY. Three fertilizer treatments were compared to an untreated check in a randomized complete block design with 4 replications (Table 1). Plots were 10' X 30' in a predominately tall fescue stand. Past management of the site was mowing only. Application rates for each fertilizer followed manufacturer or industry recommendations. Ammonium nitrate and Triple 19 were applied one time at 1 lb of nitrogen per 1000 ft². Louisville Green was applied with 2 applications of 1 lb of nitrogen per 1000 ft² 2 months apart for a total application of 2 lb of nitrogen per 1000 ft². Louisville Green manufacturer recommendations are 2 applications of 1 lb of nitrogen per 1000 ft² 4 to 6 weeks apart. Initial applications were made on October 24, 2006 for all treatments with the follow up application of Louisville Green done on January 9, 2006. Data collection included harvesting 3 random 1 ft² square subplots per plot and recording tall fescue live (fresh) weight. Live weight data were analyzed in ARM and treatment means separation was performed using Fisher's LSD at p = 0.05.

Results

There were no significant differences in tall fescue response between any of the fertilizer applications (Table 1). There was also no statistically significant difference between the Triple 19 fertilizer application and the untreated check. Operationally, all fertilizers resulted in an increase of tall fescue live weight compared to the untreated check. The highest percent increase of live weight over the untreated check came from Louisville Green at a 63 % increase, which had twice the amount on nitrogen applied as

ammonium nitrate or Triple 19. The lowest increase of fresh weight over the untreated check came from Triple 19 at a 37 % increase.

Table 1: Treatments and results for the fertilizer comparison trial

Treatment	Formulated Nitrogen Concentration	Application Rate (nitrogen per 1000 ft ²)	Fresh (live) weight (lb/ac)	Percent increase over untreated
Ammonium nitrate	33 %	1 lb	8483 a	51 %
Louisville Green	5 %	1 lb followed by 1 lb	9123 a	63 %
Triple 19	19 %	1 lb	7693 ab	37 %
Untreated	n/a	n/a	5602 b	0 %

Note: Fresh weight means followed by the same letter are not significantly different using Fisher's LSD at $p = 0.05$.