Influence of Nitrogen Source on Kentucky Bluegrass Seed Yield in Central Oregon, 2012

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Abstract

Kentucky bluegrass seed growers in central Oregon use surface-applied nitrogen applied in the fall. This nitrogen source seed yield project is a companion project to one established to quantify ammonia volatilization in fall-applied nitrogen following the irrigation season. The same five nitrogen sources urea, Agrotain-coated urea at 1.5 lbs/ton, Agrotain-coated urea at 3 lbs/ton, Agrotain-coated urea at 5 lbs/ton and ammonium nitrate were applied at 150 lbs N/acre at the same time and in the same commercial fields. There was a significant yield difference between treated and the untreated control, with no significant differences between the five nitrogen sources at the Madras location. There was statistical separation between treatments in Culver.

Introduction

Kentucky bluegrass seed growers in central Oregon use surface-applied nitrogen (N) following the irrigation season to provide a majority of plant nutrient needs. Adequate fertility in the fall when plant differentiation occurs is critical to fertile tiller establishment that determines seed yield the following harvest. Application of fertilizer without the ability to follow with irrigation leaves growers depend on natural precipitation for incorporation. Volatilization under these conditions is a concern, particularly for urea-based fertilizers when there is little to no precipitation over weeks or months. A companion project was established to quantify ammonia volatilization under these conditions in the same fields at both locations.

The objective of this project was to evaluate seed yield in the same commercial fields and from the same nitrogen sources used in the companion ammonia volatilization project under irrigation in central Oregon.

Methods and Materials

Plots were placed at two commercial fields of Kentucky bluegrass grown for seed in central Oregon. Fertilizer was applied on November 9, 2011 at the Culver location and November 10 at the Madras location. Five nitrogen sources, urea, Agrotain-coated urea at 1.5 lbs/ton, Agrotain-coated urea at 3 lbs/ton, Agrotain-coated urea at 5 lbs/ton, and ammonium nitrate were applied at 150 lb N/acre. Plots were 6 ft by 25 ft, replicated four times in a randomized complete block design.

When the remainder of the commercial fields received their fall fertilization, plots were covered with tarps to prevent additional fertilizer application. In all other respects, plots were managed by grower cooperators the same as the remainder of the commercial field until harvest. Plots were swathed on July 6 at the Madras location and July 9 at the Culver location using a small-plot, forage harvester. Samples were bagged and hung to dry until threshing with a stationery Wintersteiger plot combine. Seed samples were cleaned using a debearder and small scale Clipper cleaner to determine clean seed weight.

Results and Discussion

Results from the Madras locations indicate a statistical difference between all treatments and the untreated check, but no differences between the nitrogen sources (Table 1). Results from the Culver location indicated a significant difference between all treatments and the untreated, with seed yield from Agrotain-coated urea at 5 lbs/ton and ammonia nitrate plots being statistically higher than Agrotain-coated urea at 1.5 lbs/ton. Urea and Agrotain-coated urea at 3 lbs/ton provided similar results that were not statistically different from the other two treatments.

Table 1. 2012 Seed yields from nitrogen sources: urea, Agrotain-coated urea at 5 lbs/ton, CAN 27, UAN 32, and ammonium nitrate on Kentucky bluegrass in central Oregon.

Fertilizer Source	Madras		Culver	
	----------(lbs/acre)----------			
Unfertilized	368	b	227	c
Urea	568	a	470	ab
Agrotain-coated Urea 1 lb/ton	576	a	400	b
Agrotain-coated Urea 3 lbs/ton	534	a	504	ab
Agrotain-coated Urea 5 lbs/ton	619	a	523	a
NH_4NO_3	568	a	512	a
LSD	*313*		*285*	