Use of Foramsulfuron (TADS) as a Transition Agent for Removing Perennial Ryegrass Overseed from Tifway 419 Bermudagrass

David M. Kopec, J.J. Gilbert, M. Pessarakli, and K. Umeda
University of Arizona
Tucson, Arizona

Abstract

Two rates of Foramsulfuron (TADS) were applied at both low (0.50 lbs/M) and high (1.0 lbs/M) rates of water soluble nitrogen in May 2003 to enhance the transition from ryegrass to bermudagrass. Overall, the 0.2-ounce product/M rate of TADS herbicide, regardless of applied –N- rate produced excellent turfgrass color, density and overall turf quality. The same 0.2-ounce rate produced a good spring transition. Overall, the 0.4-ounce rate of TADS produced slightly more bermuda than the 0.2-ounce rate at the "end" of the transition (June 6). The higher fertility rates yielded better quality, color and turf density during transition then the low –N- rate when TADS was applied at the 0.4-ounce/product/M rate. Note that Tifway bermudagrass has in general, a more decumbent growing bermuda than common bermudagrass, which is less competitive during spring transition than Tifway 419. In summary, all rates of TADS enhanced spring transition. When the high rate of TADS is used on Tifway 419 (0.4 ounce/product/M), then better turf performance was achieved with the higher –N- rate applied in early May.

Introduction

The widespread use of heat tolerant turf-type ryegrass varieties in overseeding has produced a challenge for the turf manager, that being, poor spring transition. Coupled with the increased demands of producing year round conditions of high quality turfs, it has become important to find solutions to promote spring transition with a minimal loss of turf quality. With this in mind, the sufonylurea herbicide foramsulfuron (TADS) was evaluated at two rates, along with two rates of nitrogen fertilizer to enhance spring transition.

Materials and Methods

Part of a 3600 ft^2 Tifway turf maintained as a fairway was selected for the test. The site was overseeded the previous October with turf-type perennial ryegrass overseeded at 600 lbs. PLS/acre, mowed 3 times weekly at 9/16" and irrigated to prevent stress. TADS was applied to this turf at both the 0.2 and 0.4 ounce/product/1000 ft^2, along with nitrogen applied at either the 1X or 2X rates of 0.5 or 1.0 lb. N/1000 ft^2, respectively. TADS was applied to 5X10' plots on May 2, 2003 using a Co_2 back-pack sprayer attached to a three nozzle boom using 8006 nozzles, providing a solution delivery rate of 57 GPA Ferromec was applied at 4 ounces/product/M on May 3 to all turfs. Nitrogen was applied on May 4, 2003 from a quick release 15-15-15 granular fertilizer using a 2.5 wide Gandy drop spreader.

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The factorial arrangement of two TADS rates and two fertilizer rates (as well as a 1X fertilized UTC) were replicated four times in a RCB field design. Turfgrass plot composition percentage (% Bermuda, % ryegrass, % straw cover) components were assigned to plots on May 9, May 23 and June 6, while visual scores for turfgrass color, density and quality were assigned values throughout the five week transition period. All data was subjected to the analysis of variance technique using SAS software. LSD values were calculated as the treatment mean separation statistic only when the F ratio for the "treatment" source of variation of herbicide and nitrogen combinations produced a P value of 0.05 or less.

Results and Discussion

Direct Transition:

May 9, 2003

All treated turfs had essentially the same amount of bermudagrass at 7 DAT ranging from 19-21% bermudagrass plot cover. The untreated control had 7% bermuda cover at this time, three times less than TADS treated turfs, regardless of nitrogen amount applied. The percent ryegrass was inversely proportional to the amount of bermudagrass cover. (Table 1, Figure 1).

May 23, 2003

The amount of bermudagrass cover increased dramatically by 21 DAT, ranging from 59-73% among trace plots. The nitrogen only (UTC) turfs produced 40% bermudagrass. Bermudagrass cover of 70% or greater occurred at both low and high rates of herbicide and applied fertilizer at this time (Table 1, Fig 1). This interaction had no meaningful biological effect or applied interpretation.

June 6, 2003

The amount of bermuda cover now ranged from 75% to 83% among turfs treated with TADS, with the 1X nitrogen only (UTC) showing 59% bermuda cover. While not statistically significant, the high rate of TADS with the low *n* application (0.4 ounce + 0.5 lb./N) consistently had the slowest ranking transition from May to the close of the test. On June 6 this treatment had the greatest amount of visible straw turf present (6%) compared to the other treatments. This trend was somewhat noticeable, but not statistically significant. At the end of this trial, the UTC had 42% ryegrass cover, while TADS treated turfs had 17-25% remaining ryegrass cover (Table 1, Figure 1). At no time were the treatment combinations of herbicide rate and applied –N- statistically different from each other, but they were always different from the UTC (Table 1).

Turf Performance:

Turfgrass color on May 9 and May 23 showed the general trend that treatments which received the 0.4 ounce (high rate) of TADS had slightly less (green) color than when treated at the low rate (0.2 ounce) of TADS, regardless of –N- applied (Table 2). On May 9 only, TADS treated turf which received the high –N- rate had slightly lower mean color scores than when treated at the 1X –N- rate of 0.5 lb./N/M). This was true regardless of the applied herbicide rate. On May 23, both turfs treated with the high herbicide rate of 0.4 ounces/product/M had noticeably lighter color turf. Note that these same plots had moderate bermuda transition (previous discussion). Turf density values showed that the lowest ranking scores were derived from the high herbicide/low –N- rate treatment (Table 2). This response was significant on May 23, but not on June 7 even though this treatment still ranked lowest for visual turf density. Overall turf quality among all turfs was not affected by treatments at either the beginning or end of the transition, but was so midway through transition (May 23). At this point when transition was in full development (21 DAT on May 23) the high/low herbicide/N rate combination treatment ranked lowest in turfgrass quality. These scores of 5.3-5.5 are just sub-marginal and do not present on unacceptable turf condition (Table 2).

Conclusions

Overall, the 0.2-ounce product/M rate of TADS herbicide, regardless of applied –N- rate produced excellent turfgrass color, density and overall turf quality. The same 0.2-ounce rate produced a good spring transition.

Overall, the 0.4-ounce rate of TADS produced slightly more bermuda than the 0.2-ounce rate at the "end" of the transition (June 6). The higher fertility rates yielded better quality, color and turf density during transition then the low –N- rate when TADS was applied at the 0.4-ounce/product/M rate.

Note that Tifway bermudagrass has in general, a more decumbent growing bermuda than common bermudagrass, which is less competitive during spring transition than Tifway 419.

In summary, all rates of TADS enhanced spring transition. When the high rate of TADS is used on Tifway 419 (0.4 ounce/product/M), then better turf performance was achieved with the higher –N- rate applied in early May.

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Fig 1. TADS @ WC-1, Tifway 419 Bermudagrass, Karsten Turfgrass Facility, Summer 2003

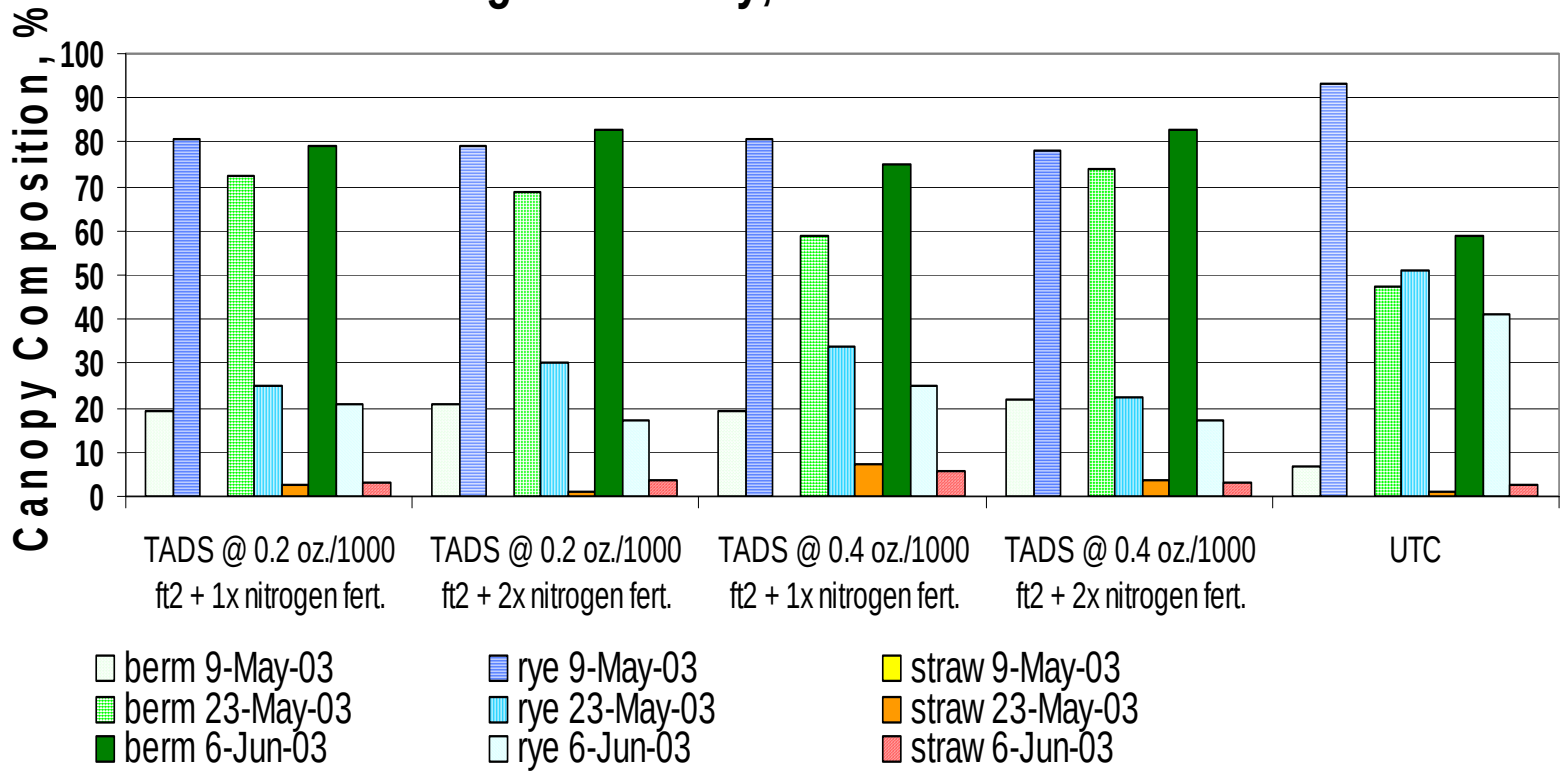

Fig 2. Tads @ WC-1, Summer 2003, Karsten Turfgra

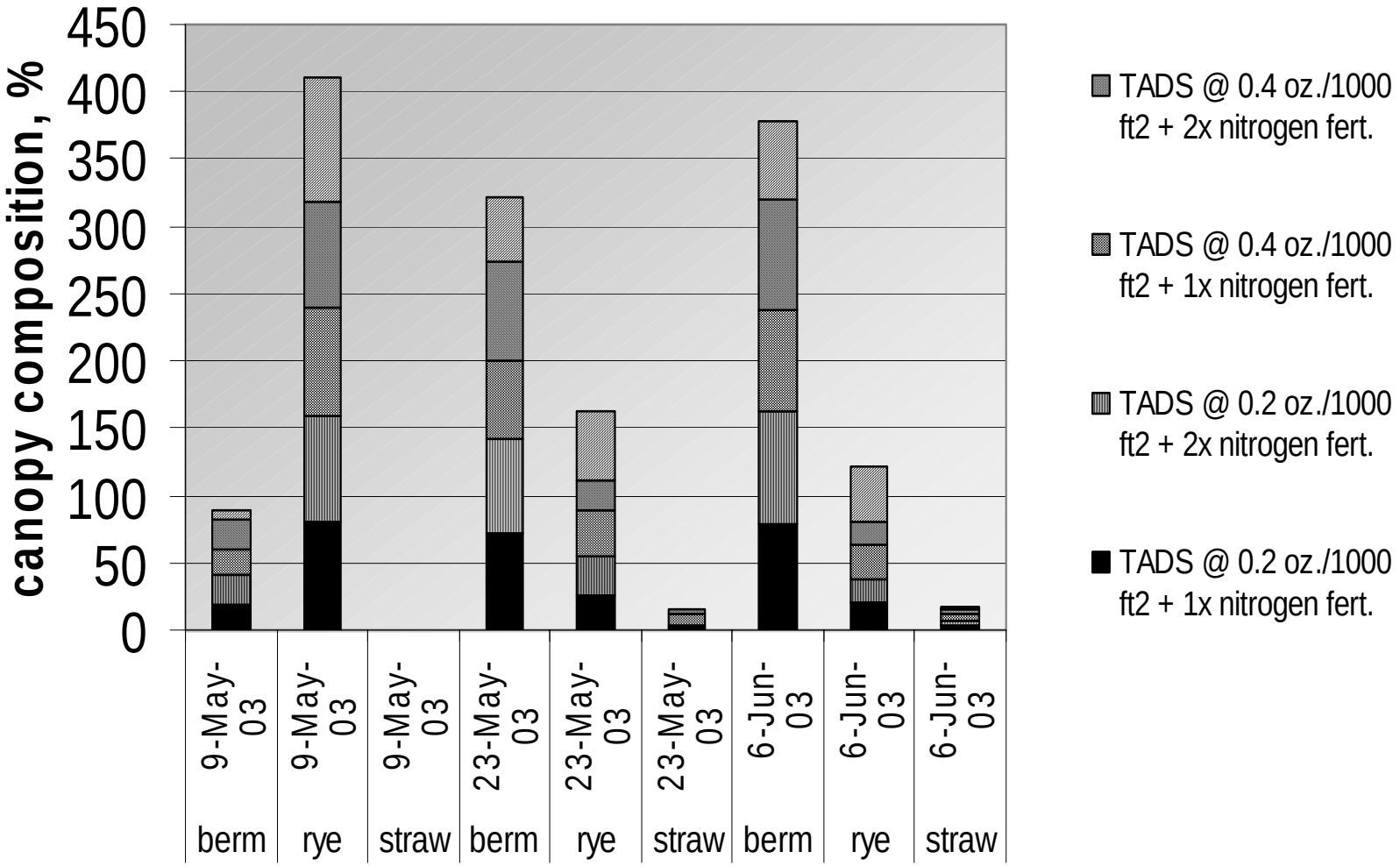

Table 1 . Mean percent plot cover composition values of Tifway 419 mowed at 5/8"
after applications of nitrogen and TADS (foramsulfuron)summer 2003, University of Arizona.

TREATMENT	%berm		%rye			%straw	
	23-May-03	6-Jun-03	9-May-03	23-May-03	6-Jun-03	23-May-03	7-Jun-03
TADS @0.2 oz./1000 ft2 + 1x nitrogen fert.	73	79	81	25	21	3	3
TADS @0.2 oz./1000 ft2 + 2x nitrogen fert.	69	83	79	30	17	1	4
TADS @0.4 oz./1000 ft2 + 1x nitrogen fert.	59	75	81	34	25	8	6
TADS @0.4 oz./1000 ft2 + 2x nitrogen fert.	74	83	78	23	17	4	3
UTC	48	59	93	51	41	1	3
Test Mean	64	76	82	33	24	3	4
LSD	18	15	6	19	15	5	ns

Percent plot cover = 0-100% Values are the mean of four replications.
Test Mean = mean of all plots on that evaluation date.
LSD VALUE = Treatment mean separation statistic. Treatments which differ in absolute value are greater than the LSD are different from each other.

Table 2. Mean Turfgrass Color, Density and Quality Response of Tifway 419 mowed at 5/8" to applications of TADS (foramsulfuron) and Nitrogen, summer 2003, University of Arizona.

	color			density		quality		
TREATMENT	9-May-03	23-May-03	8-Jun-03	23-May-03	7-Jun-03	9-May-03	23-May-03	7-Jun-03
TADS @0.2 oz./1000 ft2 + 1x nitrogen fert.	5.3	6.5	6.3	6.5	6.8	6.8	6.8	6.0
TADS @0.2 oz./1000 ft2 + 2x nitrogen fert.	5.0	6.5	7.0	7.0	6.8	6.8	6.0	6.0
TADS @0.4 oz./1000 ft2 + 1x nitrogen fert.	5.3	5.3	6.0	5.8	5.8	6.5	5.3	5.5
TADS @0.4 oz./1000 ft2 + 2x nitrogen fert.	4.5	5.5	6.3	7.0	7.0	7.0	6.0	6.8
UTC	6.8	7.5	7.0	7.8	7.3	7.0	7.5	7.0
Test Mean	5.4	6.3	6.5	6.8	6.7	6.8	6.3	6.3
LSD	1.1	0.8	ns	1.4	ns	ns	1.0	ns

Color, density, quality = 1-9, 1= dead, 5= marginal, 6= fully acceptable, 9=best posible. Means are the value of four replications.

Test Mean = mean of all plots on that evaluation date.

LSD VALUE = Treatment mean separation statistic. Treatments which differ in absolute value greater tha the LSD are different from each other.