

Evaluation of Dimension and Barricade for Pre-emergence Control of *Poa Annua* in Overseeded Bermudagrass Turf

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Abstract

*For pre-emergence control of *Poa annua* (PA), Dimension as the EC and 270 G (granular) formulations were applied either as single applications at 6 and 8 weeks before fall overseeding, followed by sequential applications of Barricade. Barricade was also applied 6 and 8 weeks before overseeding. The plots were overseeded on October 2, 2006 with a Citation III perennial ryegrass blend at the rate of 625 lbs PLS/A.*

When overseeded with perennial ryegrass:

Both pre-emerge treatments of the 270G formulation, and Barricade applied at 0.77 lbs AI/A six weeks before overseed (6WBOS) had moderate to severe stunting. Both Dimension treatments (6 and 8 weeks BOS) had no apparent loss of vigor, and were equal in vigor with that of the non-treated turf. By mid December, the 270G treatments produced the least amount of ryegrass cover. Also on October 18, there was a slight reduction in ryegrass cover for Dimension and Barricade treated turfs. The single application treatments of Dimension produced slight/moderate percent weed control in February and March, which declined rapidly by the end of March. On March 15, Dimension applied at 32 ounces/product/acre at 6 and 8WBOS had a season maximum of 43%, and 20% weed control, respectively. Barricade applied at 0.77 lbs. product/A had the highest amounts of PA control realized in this test. The pre/post application of Barricade (alone) produced percent weed control values statistically similar to that of the single pre-emergence application of Barricade alone at either 6 or 8WBOS. The 270G treatments produced much higher levels of percent (PA) control than the liquid formulation on all three dates.

In non-overseeded turf:

Liquid Dimension treatments showed NO control whatsoever at 8WBOS. At 6WBOS, 24% PA weed control was the highest control achieved early on at the November 2 evaluation. Barricade, when applied once as a pre-emergence, had good to moderate percent PA weed control, which declined after December (45% in January) at the 6WBOS timing. The 270G treatments had very good initial weed control (as it did on the overseeded plots) with 93–97% weed control on November 2, 89% - 91% on November 17, and 71-80% weed control on December 7. The affect of overseed alone on suppression of PA was 72%, 60%, and 52% (16 Feb, 15 Mar, and 26 Mar).

Introduction

Poa annua, or annual bluegrass (hereafter “PA”) is the most cosmopolitan and troublesome weed on winter turfs in Arizona. Control is complicated by the need to overseed in the fall with perennial ryegrass in order to provide a year round turf surface. Pre-emergence of the PA is in direct conflict with overseed emergence. Rubigan (fenarimol) is available as an effective, but costly pre-emergence (when applied at specified rates and timings). Rubigan controls PA at emergence yet allows emergence of both ryegrass and *Poa trivialis* emergence (as the desired overseed) species. More recently, Barricade (proflaminate) has been used for the same purpose when rates of 0.38 to 0.66 lbs/AI/A are applied from 6-8 weeks before the actual overseed date. Other products which contain other active ingredients have been evaluated, and most have not been successful for commercial use. A replicated field trial was conducted to evaluate the use of Dimension herbicide (dithiopyr) and Barricade (proflaminate) applied at either 6 or 8 weeks before overseeding, as well as the inclusion of Barricade as a sequential post emergence for the control of PA in overseeded turf.

Materials and Methods

Dimension was applied as an EW and as a granular, both applied at delivery rates which applied 0.5 lbs of an active ingredient per acre. Barricade was applied as the 65WDG formulation at 0.77 lbs AI/Acre, which also delivers 0.50 lbs. AI/A.

The exact treatments are described below:

Dimension@32oz 6weeks -pre

Dimension@32oz 8 weeks-pre

Barricade@0.77# 6-weeks pre

Barricade@0.77# 8-weeks pre

Dimension@32oz 8-weeks pre+Barricade@0.77# 8 weeks -post

Dimension@32oz 6-weeks pre+Barricade@0.77# 8 weeks -post

Barricade@0.77# 8-weeks pre+ Barricade@0.77# 8 weeks post

Best Dimension 270 G@185# 6 weeks -pre

Best Dimension 270 G@185# 8- weeks pre

NTC (non-treated control).

Treatments were applied pre-emergence at either 6 (18 August) or 8 weeks (August 4) before overseeding. Select treatments included post emergence sequential applications made at eight weeks after overseeding. The plots were overseeded on October 2, 2006 with a Citation III perennial ryegrass blend at the rate of 625 lbs PLS/A. The turf was mowed at 1.0 inch throughout the test 2-3 x weekly using a triplex reel-type mower. All treatments appeared 5 times in a split- plot field design with half of the plot being overseeded, with the other half remaining non-overseeded. This allowed for evaluating the products both with and without overseeding, and to estimate the affect of overseed, on PA suppression. Both halves were dried, scalped, and then lightly verticut prior to overseeding.

Data on *overseed turf* included ratings for initial vigor after emergence, grass percentage plot composition, color, quality, and the percent PA per plot. *Non-overseed turf* included the amount of PA cover. Percent PA weed control was calculated as the relative amount of PA in the treated plot against the amount PA in each untreated check using the formula $1 - (\text{treatment/same rep NTC}) * 100$ in order to express control on a percentage basis. The untreated check in each replicate block was utilized for percent weed control for the treatments in that respective field replicate. Data was analyzed as a RCB design using separate ANOVA's for both overseeded and non-overseeded turfs, since the interaction of overseed with treatment is of minor consequence compared to the major use of the herbicides for pre-emergence PA control in conjunction with effective emergence of the overseed grass. LSD values were calculated for all observed variables only when the F value for the main affect of "treatment" was significant at $P=0.05$, or less. PA was detectable in *non-overseeded* plots in early November, but not until February in *overseeded plots*.

Results and Discussion

Apparent vigor of ryegrass was assigned to plots (prior to a mowing event) on 10 October, 2006. Both pre-emerge treatments of the 270G formulation clearly had stunted the overseed, having mean scores of 1.8 and 2.2, for the six and eight week application, respectively (Table 1). Barricade applied at 0.77 lbs AI/A six weeks before overseed (6WB0S) also had moderate to severe stunting/vigor, with a mean vigor score of 2.6 (Table 1). Both Dimension treatments (6 and 8 weeks BOS) had no apparent loss of vigor, and were equal in vigor with that of the non-treated turf (NTC=3.4) (Table 1).

Percent Plot Composition:

The amount of bermudagrass percent as either green bermudagrass (October 26) or as straw in cold weather (November 17 and December 7) were estimated visually as their respective amount of plot cover.

On October 26 (25 days after overseeding), most treatments had minimal percent green bermudagrass regrowth 2% - 5%. The noticeable exception was that of the 270G treatments which now had 35 % bermudagrass cover (6 weeks BOS) and 13% bermudagrass cover (8 weeks BOS) and 13% bermudagrass cover (8 weeks BOS) (Table 2). These treatments also had the least ryegrass vigor noted previously (Table 1). After frosts and cold nights, there was a greater increase in visible (dormant) bermudagrass (as percent plot straw), with the NTC averaging 8% straw bermudagrass plot cover. There was no statistical difference between treated and non-treated turfs (Table 2). The same response was realized on December 7, when there was no difference between treatments and non-treated turfs (NTC averaging 6.6% straw; test average, 7.4%) (Table 2).

Visual plot density ratings were assigned from early October to mid-February, and the ratings up to and including November 17 are representative of initial post overseed performance. On these five evaluation dates, the “treatment” effect was statistically significant for turfgrass density, noting that “density” for all treatments was fully acceptable on and afterwards of October 18, 2006.

Both single pre-emerge applications of Dimension (6 and 8 weeks BOS) had good turf density, with the 8 weeks BOS treatment having slightly greater density values than the 6 week BOS treatment from 18 October to 2 November. After that time, both of these treatments had excellent density for the most part (Table 3). When applied alone as a pre-emergence before overseeding, Barricade had good density with no differences between 6 and 8 weeks BOS timings throughout the test. Both were applied at 0.77 lbs product/A (0.50 lbs. AI/A) before overseeding.

Both Dimension treatments which received Barricade at 8 weeks after overseeding (8WAOS) maintained good density throughout the test, and were not affected (in apparent visual density) by the sequential application of Barricade (made on November 22, 2006). The Barricade 8WBOS/8WAOS treatment also had good turf density throughout the test (Table 3). Again, the 270G product had low initial visual density scores on both the October 10, 18, and 26th evaluations, which was highly noticeable on the 6WBOS treatment up to and including November 2 (Table 3). The 8WBOS treatment had less of a density loss, with marginal density achieved on October 26 (5.6) and November 2 (5.2), respectively (Table 3). Both 270G treatments had fully acceptable turf density by November 17 (Table 3).

Remaining evaluations in December, January and February showed fully acceptable turfgrass density for all treatments and non-treated turf (NTC), with the treatment main effect being statistically non-significant. Note that however, that the 270G treatment did rank lowest in visual density from December to mid-February (Table 3).

Color:

Color scores were assigned to overseeded turfs on three dates, and only on February 16, 2007, was the “treatment” effect statistically significant. The lowest color scores overall were realized in early January (test mean = 6.1) (Table 1). Both Dimension treatments applied before overseeding had fully acceptable color scores throughout the test, while Barricade treatments applied only before overseed showed that the 6WBOS treatment ranged slightly lower for color than its 8WBOS counterpart (on December 7) (Table 1). There was no statistical difference for these two treatments for color throughout the entire test. Both of Dimension’s pre-emerge treatments, when followed by Barricade (8WAOS) had acceptable color scores throughout the entire test as well (Table 1). The Barricade alone (pre and post) also had fully acceptable turf color scores. The darkest color was achieved on February 16, as a response to previous injury (low initial vigor, stunting, and less ryegrass cover) for both of 270G treatments. These treatments provided mean color scores of (7.4 – 7.6) (Table 1).

The percent ryegrass overseed cover was assigned as a visual estimate on five occasions from October 18 to December 7. The “treatment’s” main effect was statistically significant on three of five evaluation events, except on November 17 and December 7. Percent ryegrass for the NTC was 87% on October 18, and 93% by December 7. After this date, percent ryegrass was essentially 98% or greater among all turfs and thus not an issue otherwise.

Early on (December 18), the 270G treatments produced the least amount of ryegrass cover, 49% and 72%, for the 6 and 8WBOS timings respectively (Table 4). Also on October 18, there was a slight reduction in ryegrass cover for Dimension treated turfs (6WBOS = 81% : 8WBOS = 88%). The same was true for Barricade applied as a pre-emergent (82% = 6WBOS : 90% = 8WBOS). The NTC had 87% cover at that time (Table 4).

Both of the Dimension pre/Barricade/post treatments had good percent plot cover, and were not different from the NTC, throughout the test. The Barricade pre/Barricade post treatment produced the same amounts of ryegrass cover as did the NTC throughout the test, noting the one time reduction on October 18 (83% vs. NTC = 87%) (Table 4). Both the 270G treatments had dramatically lesser amounts of ryegrass plot cover initially. The 270G applied 6WBOS had 49% , 65%, and 70% cover on October 18, 2006, and November 2, respectively, while the same treatment applied 8WBOS had 72%, 87%, and 86%, respectively (Table 4). On and afterwards of November 17, the amount of ryegrass cover was not affected by any treatments (Table 4).

Quality:

Overall turfgrass quality scores were assigned to plots until mid-February, when afterwards, the presence of undesirable PA became an overwhelming factor in plot appearance. Turfgrass quality was affected by treatments on the first three evaluation dates after overseeding (Table 5). The negative response of the 270G treatments were most pronounced on overall turfgrass quality, as all mean quality scores were 5.6 or less for the 6WBOS timing of this product (Table 3). At October 18, 2006, (seventeen days after overseeding), the mean quality score for that treatment was 3.8, reaching only 4.6 by October 26 (Table 5). When applied 8WBOS, the turfgrass quality was greater than the 6WBOS timing on all evaluation dates, statistically so from October 18 to November 17. This again was due to less ryegrass emergence and cover, more initial stunting, and lack of uniformity. All other treatments had good to very good color at all times during the test, including the initial rating 16 days after the actual over seeding on October 2 (Table 1). As explained previously, the expression of PA after mid-February caused so much discontinuity that “quality” was no longer a function of the ryegrass overseed anymore.

Weed Control of *Poa annua* in Overseed Turf:

When overseeded with perennial ryegrass, PA was only positively discernible beginning in February 2007, and was then rated three times for PA control (Table 6). Both the actual amount of PA present in the plot, and the calculated percent weed control are provided in Tables 6 and 7.

Percent plot PA infestation levels in overseeded turfs were 27%, 38%, and 47% on February 16, March 16 and March 26, respectively for NTC turfs (Table 6). Negative (-) weed control values did occur in which more PA existed in treated plots than non-treated plots. On all evaluation dates, the treatment main effect was statistically significant when the turf was overseeded. The single application treatments of Dimension produced slight/moderate percent weed control in February and March, which declined rapidly by the end of March. On March 15, Dimension applied at 32 ounces/product/acre at 6 and 8WBOS had a season maximum of 43%, and 20% weed control, respectively.

Barricade applied at 0.77 lbs. product/A had the highest amounts of PA control realized in this test, with the 8WBOS ranking higher than the 6WBOS timings (Table 6). This may be a result of the fact that the 6WBOS had a lower percentage ryegrass cover on October 18 (81%) vs. the 8WBOS timing (88%), perhaps allowing for more PA development. Barricade at 8WBOS had 90%, 89%, and 78% control at 16 February, 15 March, and 26 March, respectively (Table 6).

The inclusion of the sequential post application of Barricade to either of the pre-Dimension treatments proved beneficial (Table 6) up until and including March 15. The Dimension 6WBOS treatment had 59% weed control with the addition of the “post” Barricade application (28% without) on 16 February (Table 6). The same was true on March 15, when the addition of Barricade post applied had 62% weed control, versus 43% from Dimension alone (both 6WBOS with Dimension) (Table 6).

The pre/post application of Barricade (alone) produced percent weed control values statistically similar to that of the single pre-emergence application of Barricade alone at either 6 or 8WBOS. The pre/post treatment of Barricade produced a maximum PA weed control value of 81% (5% of the plot showing PA) (Table 6).

The 270G treatments produced much higher levels of percent (PA) control than the liquid formulation on all three dates. Note again that the 8WBOS treatment of 270G had 85% PA control by February 16, compared to 74% for the 6WBOS treatment (same rate/same product) (Table 6). Note that among the 270G treatments that the 6WBOS treatment had only 49% ryegrass cover, vs. 72% ryegrass cover back on October 18 (Table 4). Therefore, the more open canopy from the closest application treatment (6WBOS) could have developed more PA on a per plot basis yielding less “control” later on.

Again, when applied alone as a single treatment before overseeding, weed efficacy from Dimension in the liquid formulation provided nominal control, collapsing to a position of having more PA than the NTC. The liquid

treatments did provide good to excellent quality and plot coverage, but had poor realized weed control. The reverse was true for the granular product of 270G. These treatments had moderate – high levels of weed control, but poor and slow turf establishment and subsequent marginal quality. While Dimension (pre) followed in tandem by Barricade (post), did exhibit a benefit from the Barricade, the effect was not as good as that of Barricade applied only as a single pre-emergence application, prior to overseeding. Likewise, there was no benefit of applying Barricade again (as a post emergence tandem application) versus a one time single pre-emergence treatment of Barricade alone (either 6 or 8WBOS).

Weed Control of *Poa annua* in Non -Overseed Turf:

When the turf was NOT overseeded, it was easy to discern PA, which was visible as soon as November 2 (exactly one month after overseeding took place). When not overseeded, the maximum percent weed control occurred closest to the overseed date, tapering off by January, and generally becoming minimal by February (Table 7). PA pressure at the test site was strong, with PA plot infestation levels increasing to 67% (average of all NTC Plots) by early December, to 81% by January and 95% on more PA by mid February 2007 (Table 7).

Among treatments, the liquid Dimension treatments showed NO control whatsoever at 8WBOS. At 6WBOS, 24% PA weed control was the highest control achieved early on at the November 2 evaluation (Table 7). Barricade when applied once as a pre-emergence, had good to moderate percent PA weed control, which declined after December (45% in January) at the 6WBOS timing (Table 7). The 8WBOS timing of Barricade had better weed control, with 89% on November 2, 86% on November 17, 73% on December 7, and 61% on January 4th (Table 7). After that time, ALL chemical treatments in this test had 72% or more actual percent plot infestation levels. Interestingly enough, the “percent weed control” rankings for the 6 and 8 WBOS treatments are the same within overseed and non overseed evaluations (Tables 6, 7).

Dimension applied 8WBOS followed by Barricade applied 8WAOS had poor “percent weed control” activity throughout the test, providing only a maximum of 12% control on November 2 (Table 7). Percent weed control was much greater when Dimension was applied 6WBOS (closer to the overseed date by two weeks), followed by the additional follow up of Barricade. Still, only 34% control was achieved by December 7 (Table 7), which was 16 days after the tandem application of Barricade was made (Table 7).

There was no benefit of applying Barricade 6WAOS to the Barricade applied 6WBOS (Table 7), as weed control differed only by 10% or less between these treatments across the evaluation season (Table 7).

The 270G treatments had very good initial weed control (as it did on the overseeded plots) with 93–97% weed control on November 2, 89% - 91% on November 17, and 71-80% weed control on December 7. Like all other

remaining treatments, the PA infestation levels increased as these materials degraded/absorbed, and percent weed control was minimal, or nil (February 16 and afterwards) (Table 7).

The affect of ryegrass overseeding on PA suppression:

While the percent weed control in each case (overseed-yes : overseed-no) was calculated using the respective NTC on a per replication basis, it was most apparent by observing actual percent plot infestation levels that overseeding itself has a dramatic effect on PA, either in germination amount or expression there afterwards. PA was not detectable in overseeded plots until mid February, while it had emerged plainly as PA in the non-overseeded plots one month after overseeding (22% cover NTC – none overseed) (Table 7).

Likewise, the percentage of actual PA infestation among NTC plots for overseeded and non-overseeded turfs was 27%, 38% and 47%, versus 95%, 96%, and 96% on February 16, March 15, and March 26, respectively (Tables 6, 7) (Figure 1). Therefore the affect of overseed on suppression of PA when calculated on the mean infestation levels of the respective NTC treatments as $1 - (\text{NTC overseed} / \text{NTC non-overseed}) \times 100$; yields control or suppression of 72%, 60%, and 52% (16 Feb, 15 Mar, 26 Mar, respectively) from overseeding itself (Figure 2). This assumes a linear relationship of PA growth with time as well as no chemical by overseed interaction, but the affect of overseeding on PA suppression is dramatic. It probably plays a significant role early on and in the first half of the overseed season. Still, if PA is to be reduced for appearance and seed reservoir depletion purposes, season long control is needed since PA is a prolific seed producer.

**Fig. 1. %(PA) Plot Infestation Level as Influenced by Overseeding. U/A
2007. Dimension / Barricade PA overseeding trial.**

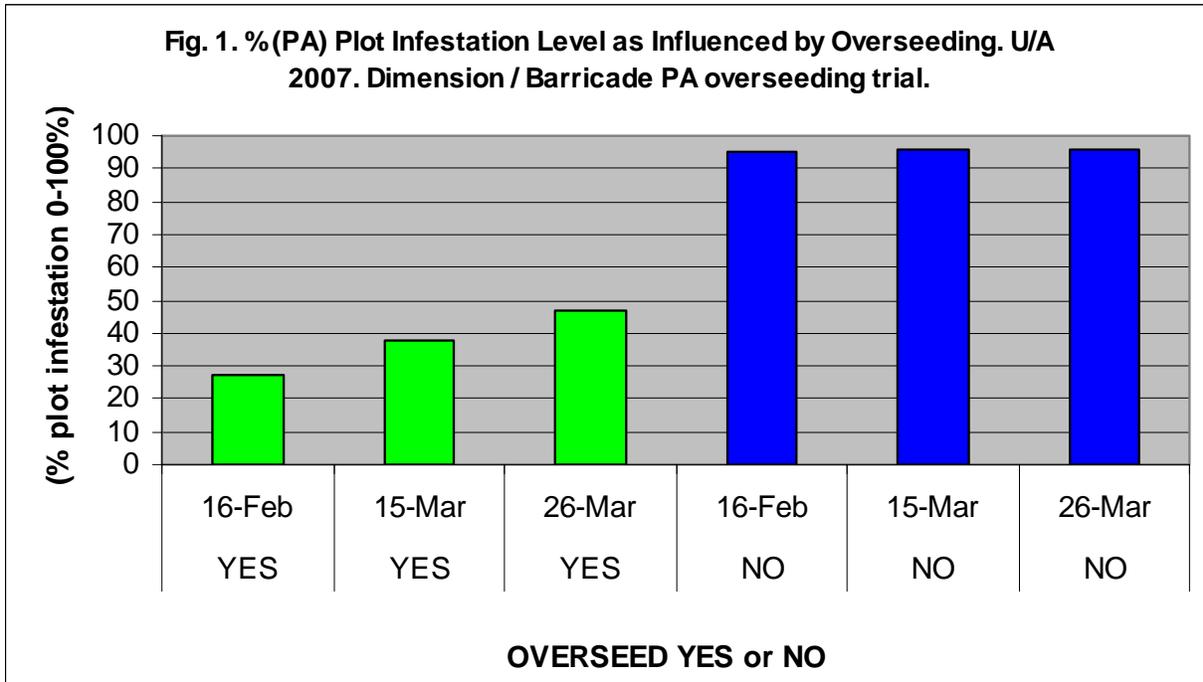


Fig. 2. Percent Suppression from Overseeding Alone. U/A 2007. Dimension / Barricade PA /overseeding trial.

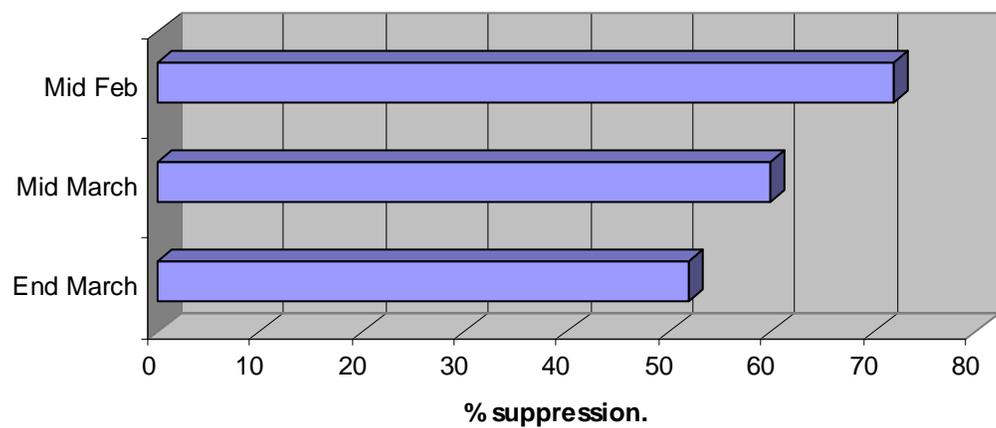


Table 1. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.

The University of Arizona, Tucson AZ.

Visual Color^{^1} & vigor^{^1}

Overseeded with ryegrass

Days after 8 pre	126	154	197	68
Days after 6 pre	112	140	183	54
Days after 8 post	16	44	87	-
Days after overseed	67	95	138	9
	-2006 -	---- 2007	-----	-2006 -
	7-Dec	4-Jan	16-Feb	10-Oct
		Color		Vigor
Treatments^{^2}				
Dimension@32oz 6-pre	6.0	6.2	6.4	4.0
Dimension@32oz 8-pre	6.0	6.2	6.0	3.4
Barricade@0.77# 6-pre	5.8	5.8	6.0	2.6
Barricade@0.77# 8-pre	6.2	5.8	6.4	3.6
Dimension@32oz 8-pre+Barricade@0.77# 8-post	6.2	5.8	5.6	3.8
Dimension@32oz 6-pre+Barricade@0.77# 8-post	5.8	5.8	6.4	3.8
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	5.8	6.6	7.4	4.0
Best Dimension 270 G@185# 6-pre	6.8	7.0	7.4	1.8
Best Dimension 270 G@185# 8-pre	7.4	6.6	7.6	2.2
NTC ^{^3}	5.8	5.6	5.4	3.4
Test mean ^{^4}	6.2	6.1	6.5	3.3
LSD ^{^5}	ns	ns	1.1	1.0

1. Values for %-visual poa & poa control are the average of 5 replications.

2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A. Bermudagrass overseeded on October 2, 2006.

3. NTC; non-treated control.

4. Test mean; average of all treatments and the NTC.

5. LSD; Least significant difference. Treatment mean separation statistic.

Table 2. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.

The University of Arizona, Tucson AZ.

Canopy composition^{^1}

Overseeded with ryegrass

Days after 8 pre	84	106	126
Days after 6 pre	70	92	112
Days after 8 post	-	-	16
Days after overseed	25	47	67
	----- 2006 -----		
	26-Oct	17-Nov	7-Dec
Treatments^{^2}	% Berm	% straw (berm)	% straw (berm)
Dimension@32oz 6-pre	2.8	9.0	7.8
Dimension@32oz 8-pre	5.0	8.4	6.0
Barricade@0.77# 6-pre	4.8	5.8	5.0
Barricade@0.77# 8-pre	5.4	8.4	7.6
Dimension@32oz 8-pre+Barricade@0.77# 8-post	2.6	10.0	7.6
Dimension@32oz 6-pre+Barricade@0.77# 8-post	2.6	7.0	9.4
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	5.2	9.6	6.6
Best Dimension 270 G@185# 6-pre	35.0	12.4	10.0
Best Dimension 270 G@185# 8-pre	13.0	9.0	7.0
NTC ^{^3}	2.2	8.0	6.6
Test mean ^{^4}	7.9	8.8	7.4
LSD ^{^5}	9.2	ns	ns

1. Values for %-visual poa & poa control are the average of 5 replications.

2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A. Bermudagrass overseeded on October 2, 2006.

3. NTC; non-treated control.

4. Test mean; average of all treatments and the NTC.

5. LSD; Least significant difference. Treatment mean separation statistic.

Table 3. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.

The University of Arizona, Tucson AZ.

Visual Density^{^1}

Overseeded with ryegrass

	68	76	84	91	106	126	154	197
Days after 8 pre	68	76	84	91	106	126	154	197
Days after 6 pre	54	62	70	77	92	112	140	183
Days after 8 post	-	-	-	-	-	16	44	87
Days after overseed	9	17	25	32	47	67	95	138
	-----2006-----						-----2007-----	
	10-Oct	18-Oct	26-Oct	2-Nov	17-Nov	7-Dec	4-Jan	16-Feb
Treatments^{^2}								
Dimension@32oz 6-pre	4.6	6.8	7.0	6.6	8.2	6.4	6.8	7.0
Dimension@32oz 8-pre	4.4	7.4	8.4	7.2	8.2	7.2	6.0	6.4
Barricade@0.77# 6-pre	3.6	7.0	7.6	6.6	8.0	6.8	6.8	7.0
Barricade@0.77# 8-pre	4.6	7.2	6.8	6.8	7.6	6.8	6.6	6.8
Dimension@32oz 8-pre+Barricade@0.77# 8-post	4.4	7.0	7.0	7.0	7.4	6.6	6.8	6.4
Dimension@32oz 6-pre+Barricade@0.77# 8-post	4.6	7.6	8.2	7.0	7.8	6.8	6.8	6.6
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	4.0	7.2	7.4	7.4	7.2	6.8	7.2	7.0
Best Dimension 270 G@185# 6-pre	2.4	3.6	4.4	4.2	6.0	5.8	5.8	5.8
Best Dimension 270 G@185# 8-pre	2.8	4.8	5.6	5.2	6.2	5.8	6.4	7.6
NTC ^{^3}	4.2	7.4	7.0	6.8	8.0	7.2	7.8	6.8
Test mean ^{^4}	4.0	6.6	6.9	6.5	7.5	6.6	6.7	6.7
LSD ^{^5}	1.3	1.4	1.3	1.2	0.8	ns	ns	ns

1. Values for %-visual poa & poa control are the average of 5 replications.

2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A. Bermudagrass overseeded on October 2, 2006.

3. NTC; non-treated control.

4. Test mean; average of all treatments and the NTC.

5. LSD; Least significant difference. Treatment mean separation statistic.

Table 4. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.

The University of Arizona, Tucson AZ.

Percent plot ryegrass¹

Overseeded with ryegrass

Days after 8 pre	76	84	91	106	126
Days after 6 pre	62	70	77	92	112
Days after 8 post	-	-	-	-	16
Days after overseed	17	25	32	47	67
	-----2006-----				
	18-Oct	26-Oct	2-Nov	17-Nov	7-Dec
Treatments²					
Dimension@32oz 6-pre	81.0	97.2	95.6	91.0	92.2
Dimension@32oz 8-pre	88.0	95.0	94.8	91.6	94.0
Barricade@0.77# 6-pre	81.6	95.2	95.6	94.2	95.0
Barricade@0.77# 8-pre	90.0	94.6	96.2	91.6	92.4
Dimension@32oz 8-pre+Barricade@0.77# 8-post	88.6	97.4	94.0	90.0	92.4
Dimension@32oz 6-pre+Barricade@0.77# 8-post	84.0	97.4	92.6	93.0	90.6
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	82.6	94.8	93.6	90.4	93.4
Best Dimension 270 G@185# 6-pre	49.0	65.0	70.0	87.6	90.0
Best Dimension 270 G@185# 8-pre	72.0	87.0	86.0	91.0	93.0
NTC ³	87.2	97.8	94.8	92.0	93.4
Test mean ⁴	80.4	92.1	91.3	91.2	92.6
LSD ⁵	9.0	9.2	12.9	ns	ns

1. Values for %-visual poa & poa control are the average of 5 replications.

2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A. Bermudagrass overseeded on October 2, 2006.

3. NTC; non-treated control.

4. Test mean; average of all treatments and the NTC.

5. LSD; Least significant difference. Treatment mean separation statistic.

Table 5. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.						
The University of Arizona, Tucson AZ.						
Visual Quality ¹						
<u>Overseeded with ryegrass</u>						
Days after 8 pre	76	84	106	126	154	197
Days after 6 pre	62	70	92	112	140	183
Days after 8 post	-	-	-	16	44	87
Days after overseed	17	25	47	67	95	138
	-----2006-----			-----2007-----		
	18-Oct	26-Oct	17-Nov	7-Dec	4-Jan	16-Feb
Treatments²						
Dimension@32oz 6-pre	6.6	7.6	8.0	6.0	6.4	7.0
Dimension@32oz 8-pre	7.4	7.6	8.4	6.6	5.8	6.4
Barricade@0.77# 6-pre	6.4	7.2	7.4	6.8	6.2	6.6
Barricade@0.77# 8-pre	7.0	7.6	7.8	5.8	6.4	6.6
Dimension@32oz 8-pre+Barricade@0.77# 8-post	7.0	7.4	7.0	6.6	6.4	6.4
Dimension@32oz 6-pre+Barricade@0.77# 8-post	7.4	7.8	7.8	6.8	6.0	6.2
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	7.2	7.6	7.8	7.0	7.2	7.6
Best Dimension 270 G@185# 6-pre	3.8	4.6	5.6	6.0	6.0	6.0
Best Dimension 270 G@185# 8-pre	5.2	6.4	6.6	6.6	6.8	7.2
NTC ³	7.2	7.8	8.2	7.0	6.8	6.4
Test mean⁴	6.5	7.2	7.5	6.5	6.4	6.6
LSD⁵	1.1	1.2	1.2	ns	ns	ns

1. Values for %-visual poa & poa control are the average of 5 replications.
2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A. Bermudagrass overseeded on October 2, 2006.
3. NTC; non-treated control.
4. Test mean; average of all treatments and the NTC.
5. LSD; Least significant difference. Treatment mean separation statistic.

Table 6. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.

The University of Arizona, Tucson AZ.
 Percent plot Poa Annua¹ & %-Poa control¹

Overseeded with ryegrass

Days after 8 pre	197		224		235	
Days after 6 pre	183		210		221	
Days after 8 post	87		114		125	
Days after overseed	138		165		176	
	-----2007-----					
	<u>16-Feb</u>		<u>15-Mar</u>		<u>26-Mar</u>	
Treatments²	poa control		poa control		poa control	
Dimension@32oz 6-pre	27.7	(16.0)	42.8	(15.4)	-20.8	(28.0)
Dimension@32oz 8-pre	14.4	(22.0)	19.8	(29.0)	-27.0	(41.0)
Barricade@0.77# 6-pre	88.8	(2.6)	80.7	(3.8)	60.0	(6.0)
Barricade@0.77# 8-pre	89.8	(3.6)	88.7	(5.4)	78.3	(6.6)
Dimension@32oz 8-pre+Barricade@0.77# 8-post	39.7	(13.2)	56.0	(14.6)	46.8	(19.0)
Dimension@32oz 6-pre+Barricade@0.77# 8-post	59.4	(9.0)	61.9	(11.0)	0.7	(16.0)
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	74.3	(6.0)	81.3	(5.0)	68.3	(11.6)
Best Dimension 270 G@185# 6-pre	73.6	(5.6)	80.9	(4.6)	66.3	(8.2)
Best Dimension 270 G@185# 8-pre	85.3	(3.4)	91.1	(2.8)	63.9	(4.0)
NTC ³	-	(27.0)	-	(38.0)	-	(47.0)
Test mean ⁴	61.4	10.8	67.0	13.0	37.4	18.7
LSD ⁵	39.1	9.5	28.8	13.3	75.2	14.5

1. Values for %-visual poa & poa control are the average of 5 replications.

2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A. Bermudagrass overseeded on October 2, 2006.

3. NTC; non-treated control.

4. Test mean; average of all treatments and the NTC.

5. LSD; Least significant difference. Treatment mean separation statistic.

Note: negative percent control indicates greater amounts of Poa were present than on the UTC.

** Value in parenthesis is of the actual percent plot Poa present.

Table 7. Dow Poa at Green Valley Country Club - fall 2006 to spring 2007.														
The University of Arizona, Tucson AZ.														
Percent plot Poa Annua ¹ & %-Poa control ¹														
Non-overseeded														
Days after 8 pre	91	106	126	154	197	224	235							
Days after 6 pre	77	92	112	140	183	210	221							
Days after 8 post	-	-	16	44	87	114	125							
Days after overseed	32	47	67	95	138	165	176							
	----- 2006 -----						----- 2007 -----							
	<u>2-Nov</u>		<u>17-Nov</u>		<u>7-Dec</u>		<u>4-Jan</u>		<u>16-Feb</u>		<u>15-Mar</u>		<u>26-Mar</u>	
Treatments²	%-control		%-control		%-control		%-control		%-control		%-control		%-control	
Dimension@32oz 6-pre	23.8	(14.8)	11.7	(26.6)	14.7	(57.0)	5.0	(76.0)	-1.0	(95.8)	-3.6	(98.6)	-5.0	(100.0)
Dimension@32oz 8-pre	0.3	(21.0)	-5.1	(31.6)	0.3	(66.0)	2.3	(78.6)	-1.7	(96.6)	-3.4	(98.6)	-5.0	(100.0)
Barricade@0.77# 6-pre	78.0	(2.8)	74.0	(6.2)	60.9	(25.8)	44.7	(45.4)	23.6	(72.0)	4.0	(91.0)	-1.0	(96.0)
Barricade@0.77# 8-pre	88.9	(3.6)	85.7	(5.6)	72.6	(19.0)	61.0	(32.6)	24.0	(72.0)	6.7	(88.6)	0.4	(94.6)
Dimension@32oz 8-pre+Barricade@0.77# 8-post	12.4	(20.2)	-5.1	(30.0)	11.5	(57.0)	10.1	(73.0)	-0.3	(95.0)	-4.6	(99.6)	-5.0	(100.0)
Dimension@32oz 6-pre+Barricade@0.77# 8-post	65.3	(6.4)	47.4	(15.6)	33.5	(44.0)	21.8	(63.0)	12.4	(83.0)	-3.6	(98.6)	-3.6	(98.6)
Barricade@0.77# 8-pre+ Barricade@0.77# 8post	63.3	(3.8)	69.4	(8.0)	69.8	(19.8)	55.7	(37.0)	31.2	(65.0)	14.5	(82.0)	14.3	(82.0)
Best Dimension 270 G@185# 6-pre	92.6	(1.0)	88.5	(3.4)	80.3	(13.2)	57.9	(35.4)	28.4	(68.0)	6.3	(89.0)	-0.6	(95.6)
Best Dimension 270 G@185# 8-pre	99.7	(0.2)	90.4	(2.8)	71.4	(19.0)	57.3	(34.6)	25.6	(71.0)	-0.7	(96.2)	-2.6	(97.6)
NTC ³	-	(22.4)	-	(30.0)	-	(67.0)	-	(81.0)	-	(95.2)	-	(96.0)	-	(96.0)
Test mean ⁴	58.3	9.6	50.8	16.0	46.1	38.8	35.1	55.7	15.8	81.4	1.7	93.8	-0.9	96.0
LSD ⁵	42.2	14.9	34.5	13.0	34.8	21.3	27.2	19.5	15.1	14.1	9.3	8.9	8.2	8.4

1. Values for %-visual poa & poa control are the average of 5 replications.
2. Treatment(s) applied at product rates, all of which are equivalent to 0.5 lbs. ai./A.
3. NTC; non-treated control.
4. Test mean; Average of all treatments and the NTC.
5. LSD; Least significant difference. Treatment mean separation statistic.

Note: negative percent control indicates greater amounts of Poa were present than on the UTC.

** Value in parenthesis is of the actual percent plot Poa present.