

Overseed Home Lawn Variety Trials

2006-2007

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Abstract

Spring transition (from ryegrass to bermudagrass) has been problematic for the last 20 years based on, in part, improved heat tolerance and lower growing cultivars of perennial ryegrass. Annual ryegrass is used sparingly for commercial properties and for home owners in southern Arizona. Hybrid ryegrass (cross between perennial and annual ryegrass) has been manufactured by seed companies in an effort to improve the transition of a grass used specifically for overseeding, with improved turf grass attributes over those of annual ryegrass. A field test was conducted to evaluate several hybrid ryegrasses, two improved annual ryegrasses, and Gulf annual ryegrass under homeowner conditions. The true annuals produced the quickest amount of ground cover in the shortest period of time. By early December, all plots had 98% or more cover, with FH having 95% cover.

Transend, Transport and 041 Lh had consistently high quality scores throughout most of the 8 month test, with Transport and 04 1 LH scoring for fair turfgrass quality into mid June. Sprint annual ryegrass had excellent turfgrass quality scores in November and December, however, scores declined substantially in April and afterwards. After emergence and into early December, Transport and 041LH clearly had the darkest turf coloration, with 041LH producing a turf with a color intensity typical of medium green perennial ryegrass. Gulf and FH were noticeably lighter in color. Gulf, Sprint and Transcend developed ring/patch type disease symptoms in early February 2007, while others did not.

“Stemminess” ratings in late spring (a time at which annual ryegrass is typically pronouncedly so) showed that FH intermediate and Gulf produced the most “stemmy” turfs, followed by Sprint annual. Transport and 041LH showed hardly any seed head culm development, with Transcend being intermediate. Interestingly, not all the entries which generally had the highest numerical rankings for density, texture, uniformity and overall turfgrass quality, had the highest percent plot living overseed during transition. Entry 041LH had 30% overseed, 46% bermuda, and 24% straw. Transcend had 16% overseed, 25% straw and 59% straw on June 12. Transport had the highest retention of green overseed (72%), with 23% bermuda and 5% bare ground or straw plot cover. Sprint had 19% overseed, 20% live bermudagrass, and 61% bare straw plot cover, more so than that of Gulf.

Final quality scores showed that 041LH and Transport had the best quality mean rank values, with all others having low quality scores on 12 June just prior to scalping to fully reconstitute the underlying Tifway bermudagrass. This shows vast improvements in turfgrass performance for INTERMEDIATES, which previously (and again) show near full acceptability in most turfgrass attributes, and now show enhanced color. Likewise, improvements in strict annual types show improved turf quality (Sprint) over Gulf.

Introduction

In southern Arizona, older home lawns consist of common bermudagrass (established from 1940's to 1970's). After this followed an increased rise in use of the sterile vegetative hybrids. E-Z Midiron and Tifway 419 bermudagrass have been sold at most retail nurseries for homeowner use. Although it is more amenable to homeowner maintenance practices, E-Z turf Midiron is "second fiddle" to Tifway when homeowners view them side-by-side on pallets at retail garden centers. Tifway 419 is used in near cosmopolitan fashion for many turf landscape applications which include commercial settings and homeowner use.

Almost 95% of all homeowners with lawns use rotary mowers and mow once per week under spousal coercion. With this in mind, an overseeding trial was conducted to evaluate annual and hybrid ryegrasses under similar conditions to practiced home lawn type maintenance with the caveat of no scalping (translates into mowing once a week at 3.0 base height). Hybrid (transitional or short rotation ryegrass) was selected because of its improved transition in the spring (back to bermudagrass) over that of perennial ryegrass. Annual ryegrass is also sold for the homeowner market and some seed companies are making conscious efforts to improve the turf qualities (color and uniformity) of annual ryegrass.

Materials and Methods

A Tifway bermudagrass (16-years-old) turf mowed in the summer at 5/8" was used for the test site at the Karsten Turfgrass Research Facility, University of Arizona, Tucson. Four intermediate ryegrass cultivars, lines, or synthetics, along with two annual ryegrass cultivars; SPRINT AEG and the forage/utility type – Gulf were overseeded on scalped Tifway on October 24th 2006. The seed rate was 625 lbs. PLS/Acre. Plot size was 3'x6'. Each grass appeared four times in a randomized complete block design.

The overseed was maintained at 3.0 inches throughout the test, after having been mowed twice at 1 3/4 inches when the grass was 2.5 inches in height. Varieties were evaluated for establishment performance and for spring transition through visible estimates of plot canopy composition (amounts of bermudagrass, ryegrass, straw, bare soil). Turfgrass density, color, quality, apparent leaf texture (leaf width indicator) and whole plot uniformity were scored throughout the season. General plant vigor scores in November were assigned to plots as a general indication of growth during establishment. Unmowed plant heights (relative ranking between entries) were scored on four dates as an indicator of the relative degree of vertical elongation rates. Also during spring transition, the degree of expression of coarse and stiff flowering culms (stemminess) was assigned to all plots in mid May and in mid June.

All data were subjected to the analysis of variance technique, using SAS mainframe computer software. Least significant difference statistics were calculated as the treatment mean separation statistic only if the 'treatment' effect in the ANOVA was significant at P = 0.05, or less.

Results and Discussion

Emergence and Fall Performance:

Turfgrass 'vigor' scores were assigned to plots on 4, 10, and 18 November using a 1-6 scale, where 1 = no growth, 4 = moderate growth, and 6 = extreme growth. On all three evaluation dates in November 2006, the treatment effect for 'vigor' was statistically significant in that the seed entries showed true relative difference for plant vigor (Table 1). On 4 November, Gulf had the most vigor, with quick emergence, wide leaves and full upright stems (mean = 5.8) (Table 1). Transport and 041LH intermediates had the least initial vigor, at 2.8 and 2.5, respectively (slight to moderate vigor). On 10 November 2006, overall vigor improved for Transport and 041LH. FH intermediate ryegrass was also vigorous (mean = 5.3). The first series of cold night temperatures occurred after 12 November, while vigor scores were slightly less on 18 November (Table 1). Still, Transport and 041LH had the least overall vigor, which was also noted in the canopy composition scores (Table 2).

The amount of overseed plant cover (0-100%) was significantly different between treatments on all three dates in early to mid November (Table 2). Gulf had the greatest amount of visually estimated plot cover (69%) on 4 November and 041LH had the least (24%) (Table 2). One week later on 10 November, FH intermediate, Sprint annual, and Gulf all had 83-85% overseed plot cover. On 18 November, only Transport and 041LH had slightly less than 75% plot cover (Table 2). The bermuda alone had 18% regrowth by 10 November. By early December, and all plots had 98% or more cover, with FH having 95% cover. The non-overseeded bermudagrass was now fully dormant (all straw) (Table 2).

The relative canopy heights (with 3-4 days growth after mowing) in early December showed that Gulf annual and FH intermediate ryegrasses had the "tallest" canopies with height scores of 1.8 each (least height suppression), followed by Transcend (3.5), and then by Transport and 041LH, both of which had the shortest canopies (5.5) (Table 3).

Overall turfgrass quality scores were statistically different between entries on all seven evaluations in 2006 and 2007 (Table 4). On 10 November, all overseed entries had mean quality score of 5.0 (marginal) to 6.0 (fully acceptable), with Sprint, FH and 041LH ranking highest in mean quality scores (5.8 to 6.0) (Table 4). On 18 November, Sprint averaged a high quality score of 7.5, with all others having mean quality scores of 6.0 or greater with the exception of FH (5.8), which was still acceptable (Table 4).

By 8 December, maximum overall turfgrass quality was achieved (average of all entries) and mean quality scores ranged from 5.0 (Gulf annual) to 7.5 (Transport intermediate). FH intermediate and Gulf annual were the only two entries which had scores of less than 6.0 (Table 4).

Turfgrass color scores were significant on all seven evaluation dates for color (Table 5). Scores of 5.0 or less indicate light color turf, with 6.0 being intermediate in green, while scores of 7 and 8 indicate increases in hue. Color scores of 4.0 or less usually indicate something problematic in terms of a stress condition. After emergence and into early December, Transport and 041LH clearly had the darkest turfs, with 041LH producing a green turf in color intensity typical of medium green perennial ryegrass. Gulf and FH were noticeably lighter in color (5.0) on 8 December (Table 5).

Visual density estimates in November and density showed that Gulf annual, Sprint annual, and FH intermediate (the most annual hybrid in appearance) had greater visual density scores initially (6.0-6.8) on 18 November (Table 6). Three weeks later, on 8 December, Sprint and Transcend also ranked highest in density (7.8 and 7.0, respectively) with Gulf and FH least (both at 5.8) Transport and 041LH also had above average density scores (both = 6.8) (Table 6).

The treatment main effect (seed entries) was significant for turfgrass uniformity on all evaluation dates. Uniformity represents a visible integration of smoothness and likeness across the canopy in all features of color, leaf width, stem height and density combined. Early on, Gulf annual produced the least uniform appearing turf (4.3), followed by FH (4.8) on 8 December (Table 7). These turfs exhibited quite noticeable variation in leaf widths, elongation rates, smoothness and “stemminess,” producing a less continuous canopy. Transport, 041LH, Sprint and Transcend produced canopies with less inherent variation in those turf attributes mentioned above. By 17 February, entries essentially ranked the same in uniformity, as did they in December, with 041LH, Transport, Transcend and Sprint having fully acceptable uniformity attributes (Table 7). 041LH ranked highest with a mean uniformity score of 7.8 on 17 February (Table 7).

Leaf texture scores represent relative differences in apparent leaf width. “Narrow leaves” are “finer” in texture (and received higher plot scores) while plots with broader (wider) leaves are coarser in texture, and thus receives lower rating score values.

In mid November (almost one month after overseeding) most grasses had fine blades, with the exception of Gulf annual and FH intermediate (5.0 and 5.0, respectively) (Table 8). These two entries had the widest leaves as mowed turfs. Most entries maintained similar rank order in terms of mean performance from November into December, with Transport, 041LH and Sprint having finer textured leaves (7.3, 7.0, 7.0, respectively) on 8 December (Table 8).

Winter and Spring Performance

In late January, a foliar disease-type symptom occurred which appeared as an orange red circular to oblong patches ranging in size from 4 to 8 inches in diameter, which then included necrosis within the ring/patch itself. The number of rings and the percent plot of the entire plot surface which expressed any of these were recorded on February 1,

2007. There was a noticeable distinction between entries in this context as Gulf annual, Sprint annual, and Transcend intermediately showed symptoms, while others did not. Gulf annual had 19 such “rings” which covered 24% of the plot surface on average, followed by lesser amounts on Transcend (5%) and Spring annual (4%) (Table 9).

Unmowed height rankings in February, March and June 2007 showed that again Gulf annual and FH intermediate ryegrasses produced the tallest “unmowed heights,” while 041LH was clearly the lowest growing in terms of vertical elongation (Table 3). This held true even up until the end of the test, when flowering culms (from the annual genome) can rapidly elevate the overall canopy height.

Late winter and spring color performance scores ranged from 4.0 (Gulf, 14 April) to 8.0 047LH (12 May) (Table 5). From February to mid-May, 041LH intermediate was quite dark in color (7.5, 7.5, 8.0), followed by Transport (7.0, 7.0, 7.0). Transcend followed next (6.3, 6.0, 6.0), with FH intermediate and Sprint producing lighter color turfs (Table 5).

For turfgrass density, the means of 041LH and Transcend generally ranked numerically first and second respectively, followed by Transcend. Sprint annual had very good density mean scores in mid February (6.5), nominal performance in April (5.8), and then decreased performance (4.8) similar to that of Gulf (4.0) and FH intermediate (4.3) in mid-May. The non-overseed Bermudagrass was now showing some regrowth by 12 May (2.0) (Table 6).

Leaf texture performance showed that Transport, Transcend, 041LH and Sprint had mean leaf textures of 6.0 or greater on 17 February, with Sprint falling below 6.0 on 14 April, and Transcend falling slightly below 6.0 on 12 May, 2007 (Table 8).

Overall uniformity scores showed again that 041LH, Transport, Transcend and Sprint were quite uniform in appearance on 17 February, with Spring losing acceptable uniformity by 14 April, with Transcend remaining marginal (5.5 on both 14 April and May) (Table 7).. Transport and 041LH had very good overall uniformity, with mean scores of 6.8 and 7.3, respectively on 12 May. The experimental entry 041LH was the only turf to maintain a score of 6.0 into mid June before plots were scalped (Table 7) for a forced transition and return to the normal 5/8 mowing height.

With all of the attributes (except for inherent color), combined into overall turfgrass quality, entries differed distinctly in performance for February, up until the close of the test on June 12 (Table 4). On February 17, 041LH had very good quality (7.5), followed by Transport (6.8), FH and Sprint (both @ 5.8), and then Transcend (5.5). Gulf annual did not have good quality turf after 18 November (6.3), and quickly lost quality after disease-type symptoms developed (Table 9), with permanent quality loss afterwards (Table 4). 041LH and Transport had very

good quality all the way up to mid May, with mean quality scores of 6.8 to 7.8 between them on 14 April and 12 May (Table 9). The other entries declined in quality after 17 February.

Transition:

The basic concept of hybrid (sometimes called transitional hybrids) is to assure a more rapid transition (compared to most perennial ryegrass cultivars) and yet have improved turfgrass quality over annual ryegrass. Hybrid ryegrasses are perhaps not defined adequately enough in terms of the percentage genome of annual vs. perennial chromosome compliments (F1 vs. backcrosses) or fluorescent characteristics. There were distinct differences between entries from the beginning of transition in mid to late May, ending in 12 June with the uniform scalping of the turf to 5/8", the height for properly maintained Tifway 419 bermudagrass.

The onset of high daytime temperatures and long day photoperiod initiated the expression of flowering culms (seed head shoots) which are coarse, stout, and elevate abruptly after a mowing event. "Stemminess" ratings on 12 May showed that FH intermediate and Gulf were the most "stemmy" (4.3 and 4.5, respectively), followed by Sprint annual (3.8) Table 8. Transport and 041LH showed hardly any seed head culm development (both at 1.3), with Transcend being intermediate (no pun intended) with a mean score of 2.5 on 12 May. Near identical scores were realized on 12 June, with 041LH showing only the slightest tendency to produce flowering culms (1.8), followed closely by Transport and Transcend (2.3 and 2.5). Gulf and Sprint remained coarse throughout transition (Table 8).

The final leaf texture ratings on 12 May showed 041LH and transport with the finest leaf textures, even during transition (7.0 and 6.5, respectively) (Table 8).

Plant canopy composition ratings on 12 May showed that Transport, 041LH and Transcend had 90-98% green cover (as the overseed), all with less than 6% plot straw, and less than 3% bare ground (Table 2). In contrast, all other entries averaged 75%-78% green turf, with the non-overseeded bermudagrass having 88% cover (Table 2). Noticeable amounts of straw were evident on FH, Sprint and Gulf on 12 May (Table 2).

The percent plot live overseed, bermudagrass, and bare/straw cover was estimated visually on 12 June. Interestingly, not all the entries which generally had the highest numerical rankings for density, texture, uniformity and overall turfgrass quality, had the highest percent plot living overseed. Entry 041LH had 30% overseed, 46% bermuda, and 24% straw (Table 2). Transcend had 16% overseed, 25% straw and a whopping 59% straw on June 12. Transport had the highest retention of green overseed (72%), with 23% bermuda and 5% bare ground or straw plot cover. Sprint had 19% overseed, 20% live bermudagrass, and 61% bare straw plot cover, which was more bare straw than Gulf displayed (Table 2).

Final quality scores showed that 041LH and Transport had the best quality mean rank values (of 5.5), with all others having low quality scores on 12 June (Table 4).

On June 15, the plots were scalped using multiple incremental height reductions from 3.0" down to 5/8" to return to proper height for Tifway 419 bermudagrass. Tifway bermudagrass in the summer is not sustainable at a winter mowing height of 3.0 inches.

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TABLES: tables for winter home lawn OS 2006-07.doc Q 307 RES REP 0607 home overseed folder Gateway.

**Table 1. VIGOR of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	4-Nov-06	10-Nov-06	18-Nov-06
Transport	Int. rye	2.8	3.5	2.8
Transcend	Int. rye	4.0	4.3	4.0
04 1 Lh	Int. rye	2.5	4.0	3.0
FH	Int. rye	4.5	5.3	5.5
Sprint AEG	Ann. rye	4.5	4.5	3.5
Gulf	Ann. rye	5.8	5.8	5.8
NTC	---	1.0	1.0	1.0
Test Mean		3.6	4.0	3.6
LSD		0.7	0.7	0.9

Vigor 1-6: 1=dead, 4=moderate, 6=most possible.

values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

Table 2. CANOPY COMPOSITION of Intermediate and annual ryegrass mowed at 3.0 inches.											
Home Lawn Overseed - fall 2006-spring 2007											
University of Arizona											
		%-Bare/strw	%C3 = Cool season grass						%-Straw	%-Bare	%-Bermuda
Entry	Grass Type	12-Jun	4-Nov	10-Nov	18-Nov	8-Dec	12-May	12-Jun	12-May	12-May	12-Jun
Transport	Int. rye	5.3	30.0	68.8	72.5	97.8	98.5	23.0	1.5	0.0	23.0
Transcend	Int. rye	59.3	43.8	76.3	81.3	97.8	90.5	24.5	6.3	3.3	24.5
04 1 Lh	Int. rye	23.8	23.8	68.8	72.5	98.3	98.8	46.0	0.3	1.0	46.0
FH	Int. rye	49.3	51.3	82.5	85.0	95.0	78.8	38.3	13.8	7.5	38.3
Sprint AEG	Ann. rye	61.3	57.5	85.0	87.5	99.5	77.0	20.0	13.8	9.3	20.0
Gulf	Ann. rye	45.0	68.8	85.0	82.5	97.8	74.5	40.8	17.5	8.0	40.8
NTC	---	0.5	0.0	18.8	0.0	0.5	87.5	75.0	0.0	12.5	75.0
Test Mean		34.9	39.3	69.3	68.8	83.8	86.5	38.2	7.6	5.9	38.2
LSD		32.5	17.8	10.0	9.5	2.6	13.3	NS	9.1	7.5	NS
%bare: amount of bare ground showing (0-100).											
%straw: amount of plot which has straw colored turf showing (0-100).											
%C3: percent of plot turf which is live overseed turf.											
Test mean: Average of all entries and the NTC (non-treated control).											
LSD: Least significant difference value used as the treatment mean separation statistic.											

**Table 3. UNMOWED HEIGHT of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	8-Dec-06	17-Feb-07	12-May-07	12-Jun-07
Transport	Int. rye	5.5	5.8	4.5	2.8
Transcend	Int. rye	3.5	3.0	3.3	2.5
04 1 Lh	Int. rye	5.5	5.5	4.5	3.8
FH	Int. rye	1.8	1.8	2.8	1.8
Sprint AEG	Ann. rye	4.0	3.5	2.3	2.3
Gulf	Ann. rye	1.8	1.0	1.3	1.5
NTC	---	-	6.0	4.8	1.0
Test Mean		3.7	3.8	3.3	2.2
LSD		1.4	0.8	2.2	1.3

Unmowed height 1-6: 1=tall, 6=short. Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

**Table 4. VISUAL QUALITY of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	10-Nov-06	18-Nov-06	8-Dec-06	17-Feb-07	14-Apr-07	12-May-07	12-Jun-07
Transport	Int. rye	5.0	6.0	7.5	6.8	6.8	7.0	5.5
Transcend	Int. rye	5.0	6.3	6.8	5.5	6.0	6.0	3.5
04 1 Lh	Int. rye	5.8	6.0	7.3	7.5	7.8	7.0	5.5
FH	Int. rye	5.8	5.8	5.8	5.8	4.5	3.8	2.5
Sprint AEG	Ann. rye	6.0	7.5	7.5	5.8	4.8	4.5	2.3
Gulf	Ann. rye	5.0	6.3	5.0	3.8	3.5	4.0	2.8
NTC	---	1.5	1.3	1.0	1.0	1.3	2.0	5.0
Test Mean		4.9	5.6	5.8	5.1	4.9	4.9	3.9
LSD		1.3	1.2	0.8	0.9	0.9	1.1	1.1

Quality 1-9: 1=dead, 5=marginal, 6=satisfactory, 9=perfect. Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

**Table 5. TURFGRASS COLOR of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	10-Nov-06	18-Nov-06	8-Dec-06	17-Feb-07	14-Apr-07	12-May-07	12-Jun-07
Transport	Int. rye	7.3	7.0	7.3	7.0	7.0	7.0	5.5
Transcend	Int. rye	6.3	6.5	6.8	6.3	6.0	6.0	3.3
04 1 Lh	Int. rye	7.8	7.8	7.8	7.5	7.5	8.0	5.3
FH	Int. rye	5.3	4.5	5.0	4.8	3.8	5.3	2.8
Sprint AEG	Ann. rye	5.8	5.8	6.3	5.8	4.8	4.8	2.0
Gulf	Ann. rye	5.0	4.3	5.0	4.3	4.0	5.0	2.8
NTC	---	2.0	1.3	1.0	1.0	2.0	2.5	6.5
Test Mean		5.6	5.3	5.6	5.2	5.0	5.5	4.0
LSD		0.8	0.9	0.6	0.8	0.7	0.9	0.8

Color 1-9: 1=dead, 3=yellow, 4=yellow/green, 5=light green, 6=green, 7=dark green, 9=forest green.

Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

**Table 6. CANOPY DENSITY of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	18-Nov-06	8-Dec-06	17-Feb-07	14-Apr-07	12-May-07	12-Jun-07
Transport	Int. rye	5.0	6.8	6.8	6.3	6.8	6.0
Transcend	Int. rye	5.8	7.0	6.3	6.5	6.5	3.0
04 1 Lh	Int. rye	5.0	6.8	6.8	7.0	7.5	6.5
FH	Int. rye	6.3	5.8	5.5	5.5	4.3	3.3
Sprint AEG	Ann. rye	6.8	7.8	6.5	5.8	4.8	3.0
Gulf	Ann. rye	6.0	5.8	4.3	4.8	4.0	2.8
NTC	---	1.0	1.0	1.0	1.0	2.0	6.8
Test Mean		5.1	5.8	5.3	5.3	5.1	4.5
LSD		1.0	1.2	0.8	0.8	1.1	1.6

Density 1-9: 1=dead, 5=marginal, 6=acceptable, 9=perfect.

Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

**Table 7. VISUAL UNIFORMITY of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	8-Dec-06	17-Feb-07	14-Apr-07	12-May-07	12-Jun-07
Transport	Int. rye	7.5	7.3	6.5	6.8	5.3
Transcend	Int. rye	6.0	6.0	5.5	5.5	3.5
04 1 Lh	Int. rye	7.5	7.8	7.0	7.3	6.0
FH	Int. rye	4.8	5.0	4.8	4.0	3.3
Sprint AEG	Ann. rye	6.5	6.0	4.8	4.3	2.8
Gulf	Ann. rye	4.3	4.0	4.0	4.0	3.5
NTC	---	1.0	1.0	1.0	2.0	4.8
Test Mean		5.4	5.3	4.8	4.8	4.1
LSD		0.8	0.8	1.0	1.4	1.6

Uniformity 1-9: 1=dead, 5=marginal, 6=acceptable, 9=ideal.

Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

**Table 8. TURFGRASS STEMINESS & VISUAL TEXTURE of Intermediate and annual ryegrass mowed at 3.0 inches.
Home Lawn Overseed - fall 2006-spring 2007
University of Arizona**

Entry	Grass Type	Stemminess		Texture				
		12-May-07	12-Jun-07	18-Nov-06	8-Dec-06	17-Feb-07	14-Apr-07	12-May-07
Transport	Int. rye	1.3	2.3	7.8	7.3	7.3	6.5	6.5
Transcend	Int. rye	2.5	2.5	7.0	6.3	6.3	6.3	5.8
04 1 Lh	Int. rye	1.3	1.8	7.5	7.0	7.0	6.8	7.0
FH	Int. rye	4.3	4.3	5.5	5.5	5.5	4.5	4.5
Sprint AEG	Ann. rye	3.8	3.8	7.0	7.0	6.3	5.0	5.0
Gulf	Ann. rye	4.5	4.3	5.0	5.3	4.0	4.5	4.8
NTC	---	1.0	1.5	1.0	1.0	1.0	1.5	5.0
Test Mean		2.6	2.9	5.8	5.6	5.3	5.0	5.5
LSD		1.5	1.1	0.9	1.1	0.7	1.1	0.8

Stemminess 1-6: 1=none, 2=slight, 3=slight/moderate, 4=moderate, 5=moderate/severe, 6=severe.

Texture 1-6: 1= dead, 5= marginal, 6=acceptable, 9= best

Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.

Table 9. Plot ring counts and % plot area with ring/patch - type symptoms of Intermediate and annual ryegrass mowed at 3.0 inches.

**Home Lawn Overseed - fall 2006-spring 2007
University of Arizona.**

Entry	Grass Type	# rings		% -Plot disease	
		1-Feb-07	1-Feb-07	1-Feb-07	1-Feb-07
Transport	Int. rye	0.0	0.0	0.0	0.0
Transcend	Int. rye	7.0	4.8	4.8	4.8
04 1 Lh	Int. rye	0.0	0.0	0.0	0.0
FH	Int. rye	1.0	0.8	0.8	0.8
Sprint AEG	Ann. rye	5.5	3.8	3.8	3.8
Gulf	Ann. rye	19.0	23.8	23.8	23.8
NTC	---	0.0	0.0	0.0	0.0
Test Mean		4.6	4.7	4.7	4.7
LSD		4.6	6.2	6.2	6.2

#-rings: Number of visible rings per plot

%-plot expression: percent plot exhibiting disease type symptoms (0-100).

Values are the average of 4 replications.

Test mean: Average of all entries and the NTC (non-treated control).

LSD: Least significant difference value used as the treatment mean separation statistic.