

# Comparison of Overseeded Grasses for Putting Greens

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## OBJECTIVE

**C**OOL-SEASON turfgrasses are commonly used for overseeding purposes in the South to provide a green, ground cover and a playing surface during the winter period when bermudagrass goes dormant. The purpose of this study was to evaluate the suitability of various bentgrass, *Agrostis* sp., species and/or cultivars for overseeding purposes.

## MATERIALS and METHODS

Nineteen entries of cool-season grasses listed in Table 1 were overseeded on a Tifdwarf bermudagrass putting green at the IFAS Turfgrass Field Laboratory, Gainesville, FL on 12 Nov. 1987. The

Tifdwarf green was sprigged on 9 Sept. 1987 and was 95% covered at the time of overseeding. The test area was topdressed 14 days before seeding with a fumigated soil identical to the Arredondo fine sand (loamy, silicious, hyperthemic Grossarenic Paleudult) on 29 Oct. 1987 at the rate of 7.4 ft<sup>3</sup>/1000 square feet (approximately one-eighth inch of soil). After topdressing, the side was dragged and watered daily.

Seed was diluted with a handful of soil and applied by hand to each plot. Plots were 4 by 6 feet in size and replicated three times in a randomized block design. After seeding, the area was again topdressed with 11ft<sup>3</sup>/1000 square feet of soil to cover the seed. Namacur was also

applied at 3 pounds of active ingredient per acre for the control of mole crickets. Preventative fungicides and insecticides were applied as needed throughout the study to minimize disease and insect problems, respectively. Light, frequent irrigation was applied three times per day during the establishment period. Two weeks after seeding, supplemental irrigation was reduced to once a day to meet daily evapotranspiration loss. Fertilizer was applied by-weekly commencing on 23 Nov. 1987 as 17-1-10 at 0.5 pounds of N per 1000 square feet.

Field data were gathered on rate of establishment based on visual estimates of percent overseeded cover three to four days during the first two months and

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Table 1. Seeding rates of cultivars, mixtures and blends of cool-season turfgrasses overseeded on a newly planted Tifdwarf bermudagrass green at Gainesville, FL.

Entries	Seeding Rate (lbs/1000 sq. ft.)
Laser Rough bluegrass	10
Saber Rough bluegrass	10
Laser (60%) and Streaker Redtop (40%)	7
Laser (60%) and Penncross Creeping bent (40%)	7
Marvelgreen Supreme Ryegrass Blend (50% Palmer, 25% Prelude, 25% Yorktown II)	30
Marvelgreen and Laser (85:15)	25
Penncross and Streaker (50:50)	5
Streaker redtop	5
Penncross Creeping bentgrass	5
Penneagle Creeping bentgrass	5
Pennlinks Creeping bentgrass	5
VNS Creeping bentgrass	5
Seaside Creeping bentgrass	5
Pennway Creeping bentgrass blend	5
National Creeping bentgrass	5
Highland Colonial bentgrass	5
Exeter Colonial bentgrass	5
Kingstown Velvet bentgrass	5
Nutri Coated Penncross Creeping bentgrass	5
Tifdwarf check - not overseeded	—

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then weekly thereafter. Data on percent cover were first transformed using angular or square root transformations accordingly before statistical analysis. Final data were retransformed back and presented in tabular form as retransformed treatment means on a monthly basis. Rate of ground cover was calculated as the total of average daily ground cover estimates for the first 50 days after seeding. Turf quality estimates were taken twice a week throughout the season but were summarized in tabular form as average monthly estimates. A rating scale of 1 to 9 was used where 9 = best and 1 = poor turf quality. Color was visually rated periodically on a 1 to 5 scale where 5 = bluegreen and 1 = apple-green color. To measure growth rates, clipping weights were taken periodically

by harvesting a mower swath taken longitudinally from the center of each plot. Samples were dried for a minimum of 48 hours at 150°F, weighed, and presented in tabular form as growth rates in kilograms per hectare per day.

As a further check on establishment rates in the field, a germination test was conducted in a controlled environment incubator to accurately assess total germination and germination rate between grasses. Seed were germinated for four weeks on a 1% agar medium in plastic petri dishes. Dishes were sealed with a plastic film to minimize water loss over a time. Approximately 100 seed were sown per dish. Four replicates in a randomized complete block were seeded. Dishes were placed in a incubator set at 15°C in

darkness and 30°C during the 8-hour light period. Light intensity was 10 W m<sup>-2</sup>. Germinated seedlings which had roots and shoots as seen at 2X magnification were counted and removed every 3 to 4 days. Germination rate was calculated and present in tabular form as the sum of average daily percent germination.

## RESULTS and DISCUSSION

Although grasses differed in total germination, the range in total germination varied from a low of only 91.6% to a high of 99.7% (Table 2). Thus, germination of all entries was excellent under controlled environmental conditions in the incubator. Rate of germination differed markedly between grasses (Table 2). Grasses having the fastest germination rates were Marvelgreen Perennial

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Table 2. Germination rate and total germination of selected cool-season grasses after 28 days with 8 hour photoperiods at 28°C with a light intensity of 10 W m<sup>-2</sup> and 16 hour dark periods at 15°C.

Cultivar	Species†	Germination	
		Total	Rate§
		%	
Seaside	CB	99.7 a*	23.9 a
Coated Penncross	CB	99.1 ab	23.9 a
Kingstown	VB	98.5 a-d	23.6 ab
Marvelgreen Supreme	PR	98.6 a-c	23.5 a-c
National	CB	98.7 a-c	22.3 b-d
Streaker	RT	98.7 a-c	22.2 c-e
VNS	CB	91.6 j	21.3 d-f
Highland	Col B	96.9 c-f	21.2 d-f
Penncross/Streaker	CB/RT	96.1 e-h	21.2 d-f
Exeter	Col B	97.1 b-f	21.1 d-f
Marvelgreen/Laser	PR/RB	97.3 b-f	20.9 ef
Penneagle	CB	95.3 f-h	20.6 fg
Penncross	CB	95.6 e-h	20.3 fg
Pennway	CB	6.3 d-h	20.1 fg
Penncross-2nd gen.	CB	92.1 ij	19.3 gh
Pennlinks	CB	96.6 c-g	18.4 h
Saber	RB	97.6 a-e	16.2 i
Laser/Streaker	RB/RT	2.0 ij	15.5 ij
Laser/Penncross	B/CB	4.2 hi	14.7 jk
Laser	B	94.6 gh	13.9 k

† CB = Creeping bentgrass, Col B = Colonial bentgrass, PR = Perennial ryegrass, RB = Rough bluegrass, RT = Redtop, VB = Velvet bentgrass.

§ Germination rate = sum of the average daily germination percentage.

\* Means within columns with the same letter are not significant different (p = 0.05) using the Waller-Duncan K-ratio t test.

ryegrass blend, Kingstown Velvet bentgrass, Seaside Creeping bentgrass, and the fertilizer coated Penncross Creeping bentgrass. Perennial ryegrass is commonly used for overseeding purposes because of its fast germination rate. It was very interesting to find that Streaker Redtop; National, Seaside, and coated Penncross Creeping bentgrasses; and Kingstown Velvet bentgrass had germination rates equal to the blend of Perennial ryegrasses. Laser and Saber Rough bluegrasses and mixtures of Laser with Streaker Redtop or Penncross Creeping bentgrass had the poorest germination rates of all grasses tested.

Grasses differed markedly in rate of ground cover and ground cover estimates throughout the growing season (Table 3). Marvelgreen Perennial ryegrass blend along with its mixture with Laser Rough bluegrass had the best rate of ground cover establishment in the field averaging 43%. Second best were

Laser and Saber Rough bluegrasses and coated Penncross Creeping bentgrass which averaged 37%. Although both Rough bluegrass cultivars had poor germination rates (Table 2), they apparently have good establishments rates as they averaged 68% ground cover in November (Table 3). This was second best to the Perennial ryegrass blend and its mixture with Laser Redtop were inferior in establishment rates in the field compared to the Perennial ryegrass blend and its mixture with Laser Rough bluegrass. Kingstown Velvet bentgrass was grouped with Highland Colonial bentgrass and Creeping bentgrass cultivars of Penncross, Penneagle, Pennlinks, Pennway, and VNS. This group had the lowest establishment rate of 21%. Coated Penncross was superior to untreated Penncross Creeping bentgrass not only under controlled conditions in the incubator (Table 2), but also in rate of ground cover and overseeded cover in November and December (Table 3).

Grasses differed in growth rates on 29 Jan. 1988 (Table 3). Additional data must be gathered and analyzed, however, throughout the remainder of the growing season to support a valid discussion on this parameter.

Overseed grasses differed in average monthly turf quality throughout the season as well as in average seasonal quality to date (Table 4). Laser and Saber Rough bluegrasses, Marvelgreen Perennial ryegrass blend, and the latter's mixture with Laser Rough bluegrass had the highest seasonal turf quality rating of 8.5. Colors differed primarily between species whereas differences between cultivars within species were very small or nonexistent (Table 4).

As this study is still underway, no conclusions should be drawn at this time.

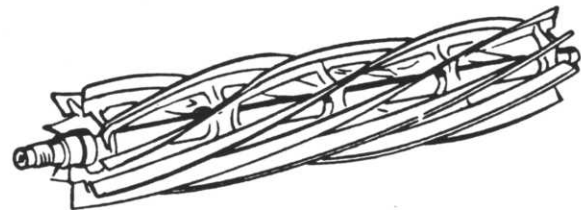
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Table 3. Ground cover estimates, rate of ground cover, and growth rate of cool-season grasses overseeded 12 Nov. 1987 on Tifdwarf bermudagrass at Gainesville, FL.

Cultivar	Species†	1987		1988			Rate		
		Nov.	Dec.	Jan.	Feb.	Mar.	Cover§	Growth	
		----- % -----							
									kg ha <sup>-1</sup> d <sup>-1</sup>
Marvelgreen/Laser	PR/RB	86 a*	98 a	99 a	99 a	99 a	43 a	18.2 a-d	
Marvelgreen Supreme	PR	87 a	97 a	98 a	98 a	98 a	43 a	15.3 c-f	
Sabre	RB	69 b	96 a	98 a	99 a	99 a	38 b	22.5 a	
Laser	RB	67 b	96 a	99 a	99 a	99 a	38 b	21.8 ab	
Coated Penncross	CB	62 b	87 b	73 b-d	87 b	90 b	34 b	13.6 d-g	
Laser/Streaker	RB/RT	41 c	88 b	93 a	95 a	99 a	30 c	16.7 b-e	
Streaker	RT	43 c	84 bc	55 f	78 cd	80 de	29 c	11.9 e-h	
Laser/Penncross	RB/CB	39 cd	88 b	92 a	95 a	98 a	29 c	16.2 c-f	
Seaside	CB	36 cd	81 b-e	68 c-e	87 b	88 bc	28 cd	18.8 a-c	
National	CB	33 c-f	82 b-d	64 d-f	83 bc	90 b	27 c-e	14.0 cg	
Exeter	Col B	34 d-e	78 c-f	44 g	69 e	79 de	26 c-f	12.5 e-h	
Penncross/Streaker	CB/RT	29 d-g	77 c-g	67 de	87 b	83 cd	24 d-g	11.4 f-h	
VNS	CB	24 e-h	77 c-g	68 de	87 b	87 bc	23 e-h	13.6 d-g	
Penncross	CB	22 gh	77 c-g	80 b	85 b	90 b	23 e-h	15.0 c-f	
Penneagle	CB	25 e-h	73 e-h	74 b-d	86 b	90 b	22 f-h	15.1 c-f	
Pennway	CB	20 gh	74 d-h	77 bc	88 b	90 b	21 gh	13.0 e-h	
Kingstown	VB	23 f-h	68 gh	58 ef	73 de	83 cd	21 gh	8.1 hi	
Pennlinks	CB	19 h	72 f-h	70 cd	87 b	92 b	21 gh	13.6 d-g	
Highland	Col B	17 h	66 h	39 g	70 e	74 e	19 h	9.4 gh	

† CB = Creeping bentgrass, Col B = Colonial bentgrass, PR = Perennial ryegrass, RB = Rough bluegrass, RT = Redtop, VB = Velvet bentgrass.

§ Cover rate = sum of average daily percent cover for the first 50 days after seeding.

\* Means within columns with the same letter are not significant different ( $p = 0.05$ ) using the Waller-Duncan k-ratio  $t$  test.

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Table 4. Turf quality and color estimates on cool-season grasses overseeded 12 Nov. 1987 on Tifdwarf bermudagrass at Gainesville, FL.

Cultivar	Species†	Quality					Color			
		Dec.	Jan.	Feb.	Mar.	Mean	Nov.	Feb.	Mar.	
		- - - - - Ratings§ - - - - -								
Laser	RB	8.8 a*	8.9 a	8.4 a	8.8 ab	8.7 a	2.0 e	1.0 e	1.7 f	
Sabre	RB	8.9 a	8.8 a	8.4 a	8.5 a-c	8.6 ab	2.0 e	1.0 e	1.0 f	
Marvelgreen/Laser	PR/RB	8.7 ab	8.6 ab	8.2 a	9.0 a	8.6 ab	1.0 f	1.7 de	2.7 e	
Marvelgreen/Supreme	PR	8.0 b	8.1 b	8.1 ab	8.8 ab	8.2 a-c	1.0 f	2.0 d	3.2 de	
Laser/Pennncross	RB/CB	7.9 b	8.3 ab	8.0 ab	8.3 bc	8.1 bc	3.7 cd	2.0 d	3.0 e	
Laser/Streaker	RB/RT	8.0 b	8.1 b	7.7 bc	8.7 ab	8.0 c	3.7 cd	2.0 d	2.5 e	
Pennncross	CB	6.8 c	6.7 c	7.2 cd	7.3 d	6.9 d	4.7 ab	5.0 a	5.0 a	
Pennway	CB	6.3 cd	6.4 cd	6.9 de	7.0 de	6.6 de	4.7 ab	5.0 a	5.0 a	
Coated Pennncross	CB	6.2 c-e	6.0 de	6.8 d-f	8.0 c	6.6 de	4.0 b-d	5.0 a	5.0 a	
Pennlinks	CB	5.9 d-f	5.7 ef	7.2 cd	7.0 de	6.4 ef	4.7 ab	5.0 a	4.8 a	
Penneagle	CB	5.7 d-g	5.8 ef	6.8 d-f	7.3 d	6.3 ef	4.7 ab	5.0 a	5.0 a	
National	CB	6.1 c-e	5.6 ef	6.5 e-g	7.0 de	6.1 ef	4.3 a-c	4.3 ab	4.0 bc	
Seaside	CB	5.5 e-g	5.4 fg	7.0 de	6.7 e	6.1 ef	4.3 a-c	4.0 bc	4.0 bc	
VNS	CB	5.7 d-g	5.5 ef	6.6 ef	6.5 ef	6.0 f	5.0 a	4.7 ab	4.8 a	
Pennncross/Streaker	CB/RT	5.6 d-g	5.5 ef	6.3 f-h	6.7 e	5.9 fg	5.0 a	5.0 a	4.8 a	
Streaker	RT	5.2 fg	4.9 gh	6.0 gh	6.0 fg	5.4 gh	3.3 d	5.0 a	4.5 ab	
Kingstown	VB	5.0 g	4.7 h	5.8 h	5.7 gh	5.2 h	4.0 b-d	3.3 c	3.7 cd	
Highland	Col B	3.7 h	3.5 i	5.1 i	5.3 hi	4.2 i	4.7 ab	5.0 a	4.5 ab	
Exeter	Col B	3.7 h	3.7 i	4.9 i	5.0 i	4.2 i	4.3 a-c	5.0 a	4.3 a-c	
Tifdwarf check	--	1.0 i	1.0 j	1.4 j	2.8 j	1.4 j	--	--	--	

† CB = Creeping bentgrass, Col B = Colonial bentgrass, PR = Perennial ryegrass, RB = Rough bluegrass, RT = Redtop, VB = Velvet bentgrass.

§ Quality rated 1 to 9 where 9 = best. Color rated 1 to 5 where 5 = bluegreen and 1 = apple green

\* Means within columns with the same letter are not significant different ( $p = 0.05$ ) using the Waller-Duncan k-ration  $t$  test.



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