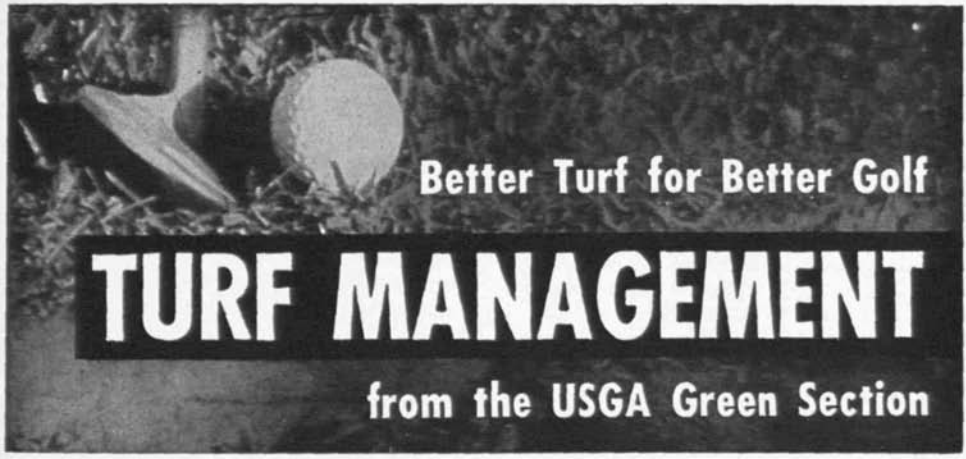

Cool Season Grasses for Winter Turf on Bermuda Putting Greens

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Many golf courses in the warm climate regions of the Mid-Atlantic area and in Southern States are using the fine leaved improved bermudagrasses for summer turf on their putting greens. Cool season grasses must be used with bermudagrass putting greens to furnish a good putting turf for two to seven months of the year. Grasses selected for winter putting turf on bermudagrass greens must provide pleasing color, good density, good putting surface and good wear resistance while bermudagrasses are dormant.

The acute problem in managing the Bermuda-cool season turf is the transition of Bermuda to cool season grass in the fall and back to Bermuda in the spring. The spring transition period is especially critical in that the high seeding rates that are essential to give satisfactory winter turf, delay the development of Bermuda in the spring. Also the cool season grasses may die in the spring before Bermuda has developed.

Satisfactory establishment of grass for winter turf is contingent upon a knowledge of the behavior of cool season grasses in relation to time of seeding and date of seeding under various environmental conditions.

During the past two years experiments were conducted at The James River Country Club, Newport News, Virginia, to evaluate various grasses for winter turf.

METHODS

Experiments during the last two years show that there are large differences in the winter season turf quality of cool season grasses seeded on bermudagrass greens. Seeding rates and time of seeding also influence quality during the winter season.

Tifgreen (328) Bermuda was established at The James River Country Club in July 1959. Nine cool season grasses and a mixture were overseeded on replicated 8 x 10 ft. plots at two dates, September 15 and October 1 of the same year.

Before overseeding the area was vertically mowed twice. There was little thatch on the new bermudagrass sod and enough soil was turned up by vertical mowing to cover the seed; hence, soil topdressing was not used. Nitrogen from

Table 1. Turf Densities of Cool Season Grasses Overseeded on September 16 and October 6, 1959 at different rates on Tifgreen Bermuda.

Grass	Rate/M	September 16 Seeding						October 6 Seeding				
		Oct. 4	Oct. 25	Jan. 21	Apr. 19	May 11	June 15	Oct. 25	Jan. 31	Apr. 19	May 11	June 15
Red Top	3		35	5	70	83	28	40	02	73	85	33
Red Top	6		37	5	73	83	37	47	15	77	83	55
Seaside	3		43	37	81	85	50	43	52	77	90	35
Seaside	6		40	43	78	88	43	38	62	82	93	45
Pennlawn	12		57	43	85	92	50	57	58	90	92	62
Pennlawn	24		80	55	85	89	53	88	77	93	97	62
Com. ryegrass	25		37	45	68	75	20	75	78	85	87	17
	50		53	72	82	77	15	85	87	92	85	13

a natural organic source was applied to supply 0.7 lbs. of N per 1000 square feet at time of seeding.

The experiment established in the fall of 1960 was similar to the 1959 study. Six grasses at two rates, and six grasses and 2 mixtures at one rate were overseeded on September 15 and October 4. Before overseeding in 1960, the area was vertically mowed twice and ¼ cu. yd. of topsoil was applied per 1000 square feet after seeding. Nitrogen rate was increased from the previous year to 1.5 lbs. of N per 1000 square feet. The 1960 experiment was put on the same area as the 1959 study. Only one half of each of the previous year's plot was overseeded. The other 40 square feet was not disturbed to determine the summer persistence of the cool season grasses sown in 1959.

During both years the treatments were arranged in split block designs and replicated three times. The newly seeded areas were kept moist until the grass was established and then mowed at a one-fourth inch height.

RESULTS AND DISCUSSION

The highest rate of overseeding gave the best turf density, Tables 1 and 2, and color during October and March. However, turf density and color from April to June did not differ between high and low rates of overseeding. Grasses seeded at a low rate gave a good cover by spring because of a favorable environment and large plants developed during this season. The data shows that lighter seeding rates could be used where there is only spring play.

Overseedings made in early October produced better turf than seedings made in mid-September; however, the differences were not large for the 1960 seeding. Tables 1 and 2. Better turf for early seeding in 1960 than for 1959 may be attributed to higher seeding rates, higher nitrogen fertilization, and a somewhat milder winter during the second year. Such grasses as common ryegrass and Pennlawn performed better during the winter months of both years when overseeded in October.

During both years the early October overseedings provided cool-season grass coverage much sooner after seeding than the September overseedings. This may be attributed to the fact that cool season grasses germinate better and develop faster under cooler soil temperatures in October as compared to September. These data show that more successful overseedings may be associated with declining soil temperatures.

Common ryegrass, which is now generally used for winter turf, germinated

rapidly and maintained a relatively high turf density from October to May during both years. In late spring the density was reduced very drastically, in 1960 it went from 85% in May to 13% in June, Table 3; and in 1961 from 70% in early June to 12% in late June, Table 4. The abrupt loss of common ryegrass before bermudagrass growth caused poor turf density, off coloring and objectionable bumpy putting surface. Such poor spring transition makes common ryegrass rather undesirable for winter turf on bermudagrass greens.

Common S-23 and Tetrone perennial ryegrasses were similar to common ryegrass in that they germinated quickly to develop a turf but all ryegrasses caused poor spring transition periods. One of the biggest objections of using perennial ryegrasses is the very tough spring growth which makes clean clipping impossible and gives an off-color.

The **Agrostis** species (redtop and bentgrass, as a whole were slow to start and were inferior in fall and winter to other grasses seeded in this test. Redtop and Highland colonial bent were the poorest while Seaside gave a better winter turf density than other bentgrasses (Table 3 and 4). Penncross was rated in between (Table 3). The second season Seaside provided better density, but its color was only fair to poor during the coldest winter months. This may be attributed to the fall of 1960.

Poa trivialis was the only bluegrass used in these tests that germinated rapidly enough to produce sufficient density and color to be suitable for winter turf The chief drawbacks of using **Poa trivialis** for overseeding bermudagrass were its off-color, deterioration of sod coverage, and uniformity due to disease in April and June.
fact that Seaside was seeded heavier the second year. All **Agrostis** studied in this test provided excellent transition periods both springs.

Pennlawn creeping red fescue gave good density and excellent color, (dark green) throughout the entire season in the first year. Excellent turf was also obtained during the second year. The stiff upright growth of creeping red fescue gave a uniform putting surface with excellent wear resistance. Its persistence in the spring and its fine texture gave a spring transition period so gradual to bermudagrass that it was hardly evident. These results indicate that Pennlawn is an excellent grass for winter turf. The behavior of Pennlawn in these experiments was confirmed under playing conditions by Mr. T. K. Baldwin, Greens Chairman of the Longwood Golf Club, Farmville, Virginia. Mr. Baldwin reports that his club had without question the best winter coverage on his bermudagrass greens after overseeding 20 pounds of Pennlawn per 1000 square feet in the

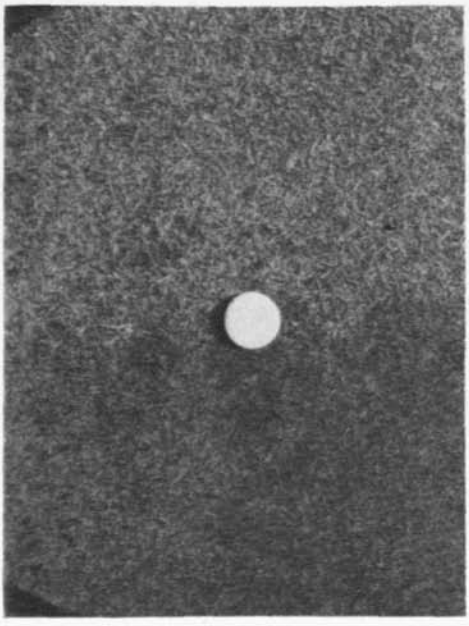
Table 2. Turf Densities of Cool Season Grasses Overseeded on September 15 and October 4, 1960 at different rates on Tifgreen Bermuda.

		September 15 Seeding						October 4 Seeding					
Grass	Rate/M	Oct. 4	Oct. 25	Jan. 11	Apr. 25	June 2	June 21	Oct. 4	Oct. 25	Jan. 11	Apr. 15	June 2	June 21
Redtop	5	25	73	45	88	85	22		32	40	87	77	23
Redtop	10	50	85	62	92	83	22		68	59	88	79	32
Seaside	5	37	83	79	92	84	57		63	73	91	83	56
Seaside	10	35	78	83	93	87	45		72	75	88	86	57
Pennlawn	18	57	87	73	96	90	62		78	75	97	92	53
Pennlawn	36	58	97	85	96	90	57		85	88	95	92	53
Com. ryegrass	30	78	83	68	94	72	6		82	70	87	62	6
Com. ryegrass	60	82	92	70	86	68	6		92	90	86	62	5

Table 3. Average Turf Cover and color ratings of cool Season Grasses Overseeded on Tifgreen Bermuda on October 6, 1959

		Dates of Observations									
		October 25		January 31		April 10		May 11		June 15	
Grass	Rate/M	Density*	Color**	Density	Color	Density	Color	Density	Color	Density	Color
Highland bent	6	43	2	33	3	82	2	88	2	47	2
Astoria bent	6	47	2	57	4	90	2	90	2	40	1
Penncross bent	6	50	2	55	4	83	2	92	1	43	2
Seaside bent	6	38	2	62	3	82	2	93	1	45	2
Per. ryegrass	50	90	3	90	3	90	5	90	2	47	5
Redtop	6	47	2	15	5	77	2	83	2	55	3
Pennlawn creeping red fescue	24	88	1	77	2	93	1	97	1	62	2
Merion Ky. bluegrass	12	28	2	28	4	88	1	95	1	65	1
Common ryegrass	50	85	3	87	1	92	4	85	3	13	3
Common ryegrass + Redtop (9:1)	28	70	3	78	1	93	4	87	3	20	3

*—Percentage of color
**—1 is best color, 5 is poorest color



An April view of the fine texture of Pennlawn creeping red fescue overseeded on 328 Bermuda as compared to the coarser textured common ryegrass.

Common ryegrass and Pennlawn creeping red fescue mixture produced a quicker cover in the late fall than the fescue alone, but turf density and color were poorer during the spring transition period than for Pennlawn creeping red fescue. The biggest disadvantage was that the larger leaves of the ryegrass in the mixture did not blend well with the fine leaved bermudas and the ryegrass influence caused a poorer spring transition than the fescue when overseeded alone.

SUMMARY

Experiments evaluating cool season grasses for winter turf on bermudagrass putting greens were conducted for two years at Newport News, Virginia. In these tests the highest rates of overseeding gave better turf density and color during the period from October to March. Little difference was found in the spring between the high and low seeding rates.

Better winter turf quality was obtained when overseedings were made in early October than in mid-September. This may

Table 4. Average Turf Cover and color ratings of cool Season Grasses Overseeded on Tifgreen Bermuda on October 6, 1960

Grass	Rate/M	Dates of Observation: October 25 Density	October 25 Color	January 11 Density	January 11 Color	April 25 Density	April 25 Color	June 1 Density	June 1 Color	June 21 Density	June 21 Color
Highland bent	10	33	1	78	3	89	3	82	2	47	2
S—23 perennial rye grass	60	85	2	95	2	93	2	80	2	13	4
Park Ky. blue grass	20	80	1	67	3	90	3	88	1	55	1
Tetrone perennial rye grass	60	83	2	48	4	81	3	63	3	13	3
Rainier creeping red fescue	36	88	1	82	2	81	4	78	2	45	3
Seaside bent	10	72	1	75	3	88	4	86	2	57	2
Perennial rye grass	60	92	2	91	3	77	5	67	4	9	2
Redtop	10	68	1	59	4	88	2	79	2	32	3
Pennlawn creeping red fescue	36	85	1	88	1	95	2	92	1	53	1
Merion Ky. Blue grass	20	20	1	85	2	93	3	92	1	61	1
Poa trivialis	20	83	1	89	1	92	5	63	3	38	5
Com. ryegrass	60	92	2	90	3	86	4	62	5	5	5
Com. rye + Pennlawn	60 (2/3-1/3)	83	2	92	2	94	2	82	3	38	3

be attributed to the fact that cool season grasses germinate better and develop faster under cooler soil temperatures in October as compared to September.

The abrupt loss of ryegrass before bermudagrass growth causes poor spring transition and makes ryegrass rather undesirable for winter turf on bermudagrass greens.

Pennlawn creeping red fescue has given excellent winter putting green turf quality during both years of testing. Its persistance in the spring and its fine texture also gave an almost unnoticeable transition to bermudagrass.

The chief drawback of using **Poa trivialis** for winter turf on bermudagrass was its susceptibility to disease in the spring. The bentgrasses were inferior in the fall and the winter due to slow development in the fall.