

Turf roots reach down deep at Black Mountain Golf Club to feed on the ureaform nitrogen that cannot leach away, but stays to be released by soil organisms. Topside, the golfer needs only his own skill to sink balls on the putting surface of the smooth and regular green.



8 Varieties, 3 Fertilizer Programs

Black Mountain Tests Fertilizers And Bentgrasses

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BETWEEN 1962 and 1966, we made a comparative study of the response and adaptation of eight bentgrasses to three fertilization programs. This report has been prepared for the benefit of the golf superintendent and turf management specialist who may not have an opportunity to conduct such a study. We hope it will serve as a guide to those interested in choice of bent species

as well as in fertilizer performance.

Our greens management program today at Black Mountain Golf Club is based on the results of this study. And since our budget is modest, outstanding bent greens is our one feature that can compete with golf courses anywhere, as can be seen by the adjacent photograph.

All greens of 9,000- to 10,000-square-feet are seeded for economic

reasons, and now our choice is Seaside or Penncross. The smaller greens are vegetatively propagated; C7 Cohansey and Old Orchard have proved the most reliable for this purpose.

Black Mountain Golf Club is 15 miles east of Asheville, N.C., where the average elevation is 2,250 feet. Bentgrasses do well in this climate, even though we are in the transition zone between cool-season and warm-season grasses.



Superintendent Ross Taylor stands on the fairway of what he believes to be the longest hole in the world — Number 17, a 745-yard, par 6 dogleg.

Experimental Plot Preparation

The test work was conducted in cooperation with Dr. William B. Gilbert, associate professor of crop science at North Carolina State. The experimental layout (Page 27) identifies the bent species and the fertilization programs included in this study.

The first six bentgrass species have to be vegetatively propagated; Numbers 7 and 8 are seeded species.

The plots were very carefully pre-



pared to assure uniform results. The soil was disked and harrowed before adding the sand and Turface. Turface was added at the rate the soil analysis indicated, and was worked into the plots using a rototiller. The ground was then raked, leveled, and rolled to firm up the soil before planting. Lime was spread at the rate of 100 lbs. per 1,000 square feet.

The powder type of ureaform fertilizer was applied by a mechanical spreader rather than the usual spray method. We believe that this gives more uniform coverage. The sprinkler was then used to wash the fertilizer into the soil. Fertilizer programs B and C were applied in the normal way. The three types of applications permitted us to evaluate difference in direct application vs. use of balanced fertilizers and the merits of monthly application vs. two applications annually.

Eight weeks after planting, difference in coverage by the various grass

strains was becoming apparent. (See bottom left, Page 27.) On the left is Pennncross; in the middle is C52 Old Orchard; and on the right is C50 Washington. Ten weeks after the plots had been planted or seeded the grass species showed good coverage.

During the five-year period of this study, annual soil tests were made to keep the proper balance of N, P, and K, and to maintain the correct pH. The plots were observed with regard to the weather, disease, and wear resistance of the various species.

The plots were mowed at 3/16 to 1/4 inch four to five times a week during the growing season. When rain was insufficient for moisture requirements, the plots were watered on the same basis as the regular greens. Other cultural practices such as aeration and/or verticutting were not followed because we wanted to keep the species confined to the designated plots.

Weeds were not much of a problem. The fertilizer programs kept most of the turf plots thick enough to prevent weed seeds from germinating. Where weeds or crabgrass appeared, they were removed by hand.

There was an annual disease control program for the plots. We applied fungicides such as mercury, Thiram, Tersan, Captan, P.M.A.S., or iron, or a combination of these, as a preventive when weather conditions were right for disease to develop. They were used as a corrective measure when disease appeared.

Since we did not observe any insect damage in these plots and no serious infestations occurred in the area, no insecticides were applied.

Five-Year Summary

A summary of the five-year results with the various turf strains follows:

1. C7 Cohansey and C15 Toronto showed exceptional weather, disease, and wear resistance in all plots, as did the Pennncross and Seaside strains.

2. C1 Arlington and C52 Old Orchard were very satisfactory in all plots.

3. Washington C50 showed up poorest of the eight species. Verticutting and additional fertilizing might have improved the performance.

4. The uniform growth of the three replicates of the C1-C19 Arlington and Congressional was very significant in the plots where powdered ureaform (Plot A) was used. There

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was no separation in these plots, as usually occurs with mixed species, but strains were completely separated in the plots receiving the other fertilization programs (Plots B and C). This difference was noticed after the first year of growth.

Significant Observations

Over this five-year period the following significant observations were made with regard to the various fertilization programs.

1. In the spring Plots A and C always looked better than the plots B. The powdered ureaform Plots (A) always stayed greener longer in the fall.

2. All plots looked extremely good in the middle of the summer and in early fall.

3. The species in the plots that received the ureaform fertilization programs recovered from disease attack quicker and with less reduction of vigor.

4. One of the most interesting observations (See bottom right.) was to see the powdered ureaform plots real pretty and green when the temperature was 7 below zero!

Program Recommended

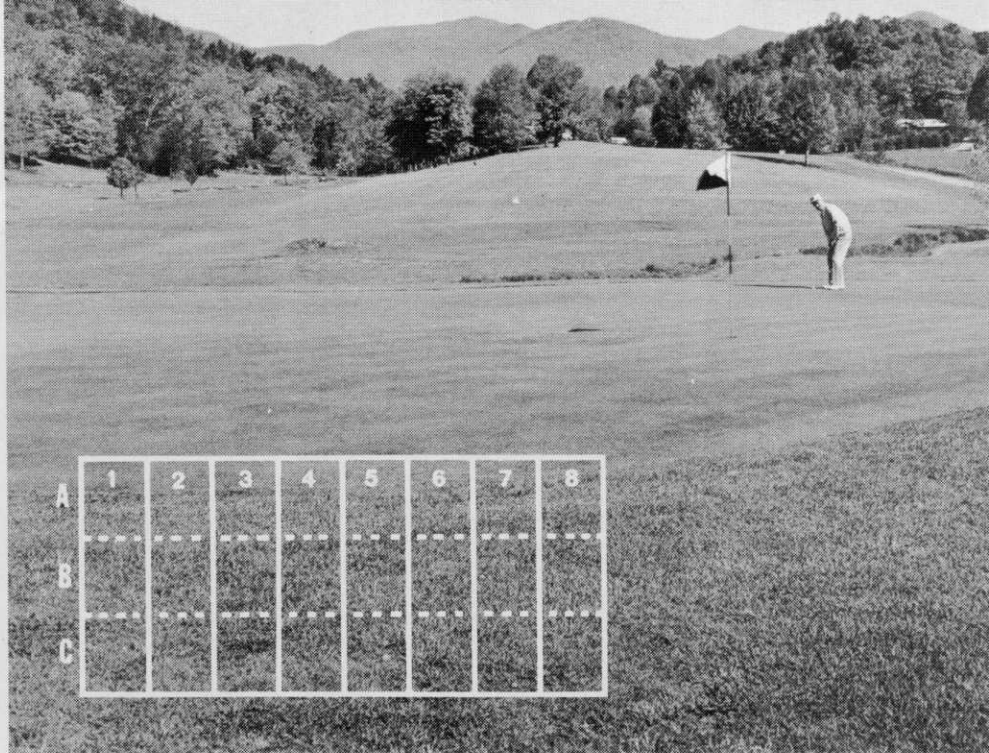
After evaluating these results and analyzing our economics, the turf maintenance program outlined below is followed for all 18 greens to keep them healthy with good color.

1. The Seaside species was selected for use on the larger greens that are seeded at Black Mountain. C7 Cohansey and Old Orchard are the choice for vegetative propagation.

2. Based on our soil analysis and the nutrient removal, we know we need a 4-1-2 fertilizer ratio.

3. Based on this fertilizer study, we selected a 16-4-8 with 60% ureaform nitrogen, and apply annually 10 to 15 lbs. of nitrogen/1,000 square feet to greens.

We make only three applications



Black Mountain's bentgrass experiment setup is superimposed above (not the location) showing three replications of eight bentgrasses. The plot size was 5x32 feet. Strains were: 1—C1 Arlington; 2—C7 Cohansey; 3—C15 Toronto; 4—C50 Washington; 5—C52 Old Orchard; 6—C1-C19 Arlington and Congressional; 7—Penncross; and 8—Seaside. Fertilization: Nitrogen, 10 lbs./1,000 sq. ft. annually. (A) Powder-type of ureaform: 6.5#N/1,000 sq. ft. 38-0-0; 15#/1,000 sq. ft. 0-10-20 in spring; and 3.5#N/1,000 sq. ft. 38-0-0; 15#/1,000 sq. ft. 0-10-20 in the fall. (B) Activated sewage sludge plus 3#KC1/50#, monthly applications April through October. (C) 10-6-4 commercial product with 60% N from ureaform, monthly applications April through October. The ureaform used in these experiments was "Powder Blue type of Nitroform"; the activated sewage sludge was "Milorganite."

a year to greens with the first about April 1 (12-15 lbs.), the second (10-12 lbs.) about May 30, and the final application (20-25 lbs.) between Sept. 1 and 5. This third application is the heaviest to be sure to have good nitrogen residual to carry us into the next spring.

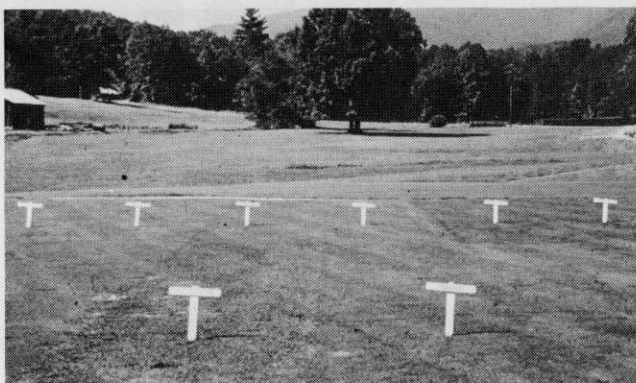
4. Proper cultural practices are also followed which include regular mowing at the proper height, and aerifying and/or verticutting.

5. On our bluegrass fairways we use a 12-4-8 (with 60% N from ureaform) and apply 300 lbs. per acre in the spring and 400 lbs. per acre in the fall.

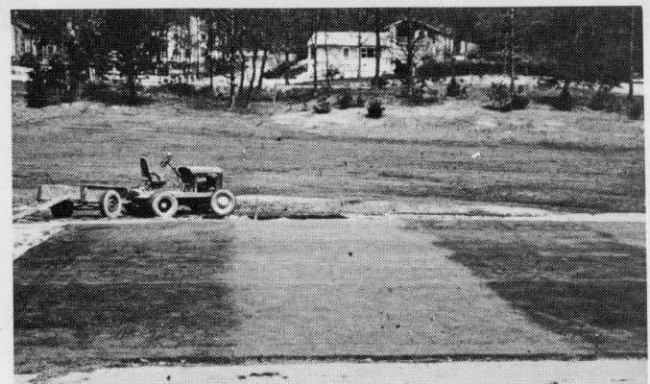
Home Irrigation Guide Available From Buckner

A brochure for planning a home lawn sprinkling system is available from Buckner Sprinkler Co., Fresno, Calif.

Called "Six Easy Steps to Permanent Home Irrigation," the brochure covers design of an underground sprinkler system, sprinkler head positioning to insure uniform watering, pipeline layout, material needs, installation directions, and conversion to automatic controller operation. For more details, circle (712) on the reply card.



Experimental plots showed this good coverage in 10 weeks. Stolons were topdressed after first cutting.



Temperature: 7 degrees below zero! Darker color of ureaform plots indicates superior cold weather resistance.