



To obtain even distribution of materials, divide total quantity in half and spread in two directions.

Management Basics for Bent Greens In Southern Areas

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Once upon a time bentgrass was only for northern climates. As the desire for the ultimate in putting surfaces spread, the use of bentgrass on putting greens spread as well. Today it may be found in all but a few of the hottest and most humid Gulf Coast states. Even some Hawaiian courses have bentgrass greens. It is THE grass for championship putting surfaces.

There is a considerable amount of interest in, and much more to be learned about, growing bentgrass on putting greens in warmer areas. An examination of a few basics in bentgrass management will illuminate the subject.

SOILS

One of the major requirements for good bentgrass greens is the media in which the turf has to grow. For some years the USGA Green Section has advocated greens with adequate drainage, both on the surface and throughout the soil itself. Without doubt the amount of maintenance required for a bentgrass green, and in many cases the very success or failure of the green, depends upon the percolation of the soil. This was a para-

mount consideration when the Green Section specifications for a method of putting green construction were developed in 1961.

It has often been said that bentgrass can survive on the oxygen in fresh water if no other oxygen is available. But the key word here is "fresh." Nothing puts bentgrass out of commission faster than water standing on the surface. Weekly spiking of bentgrass greens in hot weather is a very definite aid to better movement of air and water into the soil by breaking up soil crusts which may form.

WATER

The principles of watering bentgrass greens are the same as watering all other grasses, but sometimes we are forced to make slight alterations. Basically, bentgrass greens should be watered deeply and at a low rate of precipitation. Excess water standing on the surface must be avoided. The turf should then go as long between waterings as nature will allow: the turf should begin to show some signs of stress before more water is applied.

A blue-grey color and/or foot printing in the heat of the day are the first signs of turf-

grass moisture stress. Bentgrass greens should be syringed immediately when this occurs, giving each green of 5,000 square feet about five minutes of water. The more water pressure the better. High pressure breaks up the droplets into a mist when a rose nozzle is used. The nozzle should be pointed upward and kept moving at all times. If it were possible, we would like to get water on the leaves to cool them, but leave the soil dry.

A good water man knows from experience how much water a green should have, about how long it will last, and where to put it. For instance, he knows that if you give more water to the high spots, the low spots will take care of themselves. He would never start by watering the front of a green pitched from back to front and he instinctively knows that greens usually dry from the outside in. The proper placement and timing of watering is just as important as water itself.

Never water greens to soften them and to make them hold a shot. By watering greens to soften them, you water to saturation, and thereby exclude oxygen from the soil pores. When oxygen is excluded the grass roots sluff off and grow only near the surface, which means the shorter the roots, the more often you have to water. It goes on and on, and you eventually lose. In this kind of situation, your greens may always hold a shot, but with a little adverse weather the holding surface may soon be without bentgrass.

Another reason for letting the greens go as long as possible between waterings is that when they are kept saturated, the water acts as a lubricant between the soil particles, and may puddle the soil. Puddling in this case means that saturated greens under golfer traffic only get harder as more water is applied.

FERTILIZER

Different bentgrasses have slightly different fertilizer requirements. Overstimulation is as bad, if not worse than starvation. When bentgrasses are overfed, they tend to become lush and succulent, and are therefore less resistant to traffic and more prone to wilt and disease. Clipping yield, color, and vigor

are the main guidelines to proper green fertilization. The number of pounds of nitrogen applied per 1,000 square feet per year will vary with the length of the growing season in various parts of the country. Ideal growth in bentgrass occurs around 75 degrees F., and you had better be careful with nitrogen feedings when temperatures climb.

To maintain color without pushing bentgrass in the hot months, one ounce of iron sulfate or magnesium sulfate per 1,000 square feet may be helpful. These materials should not be used on a regular basis on greens because the normal green color should be a characteristic of properly fertilized turf. Their use on special occasions will help to avoid overstimulation and still give the desired color.

Bentgrasses reportedly consume nutrients in an approximate ratio of 4-1-2, although there is some disagreement among authorities. In any event, a soil test is most helpful in evaluating your nutrient needs, and will also help in maintaining the proper pH level. However, the soil tests should be used only as a guide and should not be considered the final and absolute answer in determining putting green nutrition.

Bentgrass will tolerate a wide variety of pH levels, but we believe that a pH of approximately 6.2 is best. Bentgrass prefers slight acidity, and nutrient availability is also greatest near a pH of 7.0.

MOWING

Mowing frequency and direction is important on bentgrass greens. Greens mowed every day present the most desirable putting surfaces. However, four-times-a-week mowing is usually the most acceptable, budgetwise. Mowing direction is important and should be changed each time to reduce grain. This problem of grain development and mowing direction may become more serious as we move toward the use of larger triplex mowing units. Direction changes are extremely important.

Vertical mowing is not only accomplished to check grain development, but also to clip off *Poa annua* seedheads, and to smooth and



Weekly spiking during the summer aids air and water penetration, and breaks crusts.

speed the putting surface as well. Care should be taken to avoid vertical mowing damage to the putting surface. Usually, the mower is set just to comb the ends of the grass blades. Deeper slicing should be done at the right time and with the more powerful vertical slicing machines designed to remove thatch. The vertical slicing machine should be set actually to slice the turf, and yet to do a minimum of damage to the putting surface. Slicing operations should be followed by top-dressing to smooth the putting surface and encourage the turf to heal quickly.

WEED CONTROL

A good green should be weed-free. Nevertheless, weed problems develop. Usually the use of unsterilized top-dressing material is the prime source of the seed. Clover, chickweed and crabgrass are the three main weeds which trouble greens. Mecoprop will control clover and chickweed in most greens if applied at the proper rate and at the proper time. Arlington and Congressional bentgrasses

have been reported to be sensitive to Mecoprop, and hand weeding must be considered where they are present.

As for crabgrass control, a number of materials may be used with satisfactory results, but each material has its own characteristic action.

Phenyl mercury (PMA) is an effective crabgrass control and fungicide agent, but it must be applied when crabgrass is in the early seedling stage. This chemical can produce a turf burn in hot weather.

DCPA (Dacthal) is a good pre-emergence control material for all crabgrasses. It was not originally recommended for use on bentgrass greens, but experience now proves that it has a wide margin of safety on all but Cohansey bent. As with most preemergence materials, the soil should be undisturbed until the crabgrass germination period has passed.

INSECTS

Most insects are controlled by timely applications of the chlorinated hydrocarbon ma-

terial (Chlordane). The wettable powder formulation is preferred because of the increased safety to bentgrass.

Several newer insecticides, such as Diaznon or Sevin, have also been proven to be very effective. Because these materials have only a short residual life, they are recommended on a curative basis, rather than for preventative insect control.

FUNGICIDES

A fungicide program, whether curative or preventative, is essential for good bentgrass greens in most sections. There is an array of broad-spectrum and specific disease fungicides for golf course use available today. They will give good control of most turfgrass diseases when properly employed.

THE BENTGRASS TO USE

Many good bentgrass strains are now available for use on putting greens (see "Story of Cohansey" in the September, 1968, USGA Green Section Record). Creeping bents make up the majority of the turf on greens, and only seaside and pennecross of the creeping bentgrasses can be seeded. This gives them an advantage over the selected strains of bentgrasses which must be propagated by stolons.

These special bentgrass strains were originally selected for certain desirable characteristics in a particular region. You may select your own strain of bentgrass based on color, disease resistance, vigor, growth characteristics, or any number of other features. In the final analysis, however, its performance usually depends upon the management it receives.

STATEMENT OF OWNERSHIP

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of October 23, 1962; Section 4369, Title 39, United States Code). 1. Date of Filing—October 1, 1968. 2. Title of Publication—USGA GREEN SECTION RECORD. 3. Frequency of issues—Six issues a year in January, March, May, July, September and November. 4. Location of known office of publication—40 E. 38th Street, New York, N.Y. 10016. 5. Location of the headquarters or general business offices of the publishers—40 E. 38th Street, New York, N.Y. 10016. 6. Names and addresses of Publisher, Editor, and Managing Editor: Publisher—United States Golf Association, 40 E. 38th Street, New York, N.Y. 10016. Editor—William H. Benguefield, 40 E. 38th Street, New York, N.Y. 10016. Managing Editor—Robert Sommers, 40 E. 38th Street, New York, N.Y. 10016. 7. Owner (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given.) Names and addresses—United States Golf Association, 40 E. 38th Street, New York, N.Y. 10016; President—Hord W. Hardin, 40 E. 38th Street, New York, N.Y. 10016; Vice-Presidents—Robert K. Howse and Philip H. Strubing, 40 E. 38th Street, New York, N.Y. 10016; Secretary—Fred Brand, Jr., 40 E. 38th Street, New York, N.Y. 10016. Treasurer—Eugene S. Pulliam, 40 E. 38th Street, New York, N.Y. 10016. 8. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities—None. 9. Paragraphs 7 and 8 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a corporation which itself is a stockholder or holder of bonds, mortgages or other securities of the publishing corporation have been included in paragraphs 7 and 8 when the interests of such individuals are equivalent to 1 percent or more of the total amount of the stock or securities of the publishing corporation. 10. This item must be completed for all publications except those which do not carry advertising other than the publisher's own and which are named in sections 132.231, 132.232, and 132.233 Postal Manual (Sections 4355a, 4355b, and 4356 of Title 39, United States Code).

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A. Total No. Copies Printed (Net Press Run)	7,353	6,500
B. Paid Circulation		
1. Sales Through Dealers and Carriers, Street Vendors and Counter Sales	none	none
2. Mail Subscriptions	5,605	5,647
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D. Free Distribution (including samples) by Mail, Carrier or Other Means	280	280
E. Total Distribution (Sum of C and D)	5,885	5,927
F. Office Use, Left-Over, Unaccounted, Spoiled After Printing	1,468	573
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