

Treatment of Bermuda Greens

The following interesting letter on winter treatment of Bermuda greens, from Mr. Hugh H. Miller, of the Colonial Country Club, Memphis, Tennessee, has led us to ask for the experience of others who have had to do with Bermuda turf. Thus far seven reports have been received in response to our request, and we are glad to be able to publish them in connection with Mr. Miller's experience. It is hoped that additional reports may be received later, in which case they will be published in later numbers of THE BULLETIN.

"I have been chairman of a green committee for six years, and have built three 18-hole golf courses and maintained one or two of them for that length of time, and all have Bermuda greens. My greens have purer and more luxuriant Bermuda turf than any others I have seen. THE BULLETIN has repeatedly advised planting Bermuda greens with winter grasses, and playing on them all the year round. My method of taking care of these greens is directly opposed to the advice given in THE BULLETIN.

"Between the 1st and 15th of January our greens are closed for play and the cups put in smaller temporary greens previously sown with winter grasses and put in condition for play. The regular Bermuda greens are then forked with a spading fork, in order to loosen the underlying soil. The turf is not broken. The fork is forced down into the greens the full length of the tines, and then gently shaken so that it breaks the soil under the turf. It is then withdrawn and the operation repeated. The men work across the green in an approximately straight line, and start the next line about 6 inches from the first. This operation leaves little ridges in the green where the forks were withdrawn. The greens are then covered with about an inch of rotted manure, and are thus laid by until about the 1st of April, or until *Poa annua* begins to show up rather thickly on the greens. What remains of the manure is then raked off, the surface is lightly rolled to depress the little ridges, and regular mowing begins. At this stage the Bermuda has not begun to grow, but close cutting of the *Poa annua* and warm weather bring it out, and in a few weeks all the *Poa annua* disappears. Just as soon as the Bermuda is thriving, with the weather warm and balmy, the greens receive their first light top-dressing. This, together with other top-dressings used during the summer, do not ordinarily need any fertilizing ingredient. The function of these top-dressings is to smooth the surface of the green, and in hot, dry weather to insulate the surface from the direct rays of the sun. This dressing should never be wet down, but should be applied dry and left dry. A light dressing of sandy loam, dry and well screened, will work down in the grass and practically disappear after one or two mowings. By lightly top-dressing in this manner every two or three weeks, I have brought Bermuda greens through ninety days of drought, without a drop of water, and showing a clear, thick, healthy turf at the end of the drought. If the season has plenty of rain, top-dressing is not done nearly so often, and then only to improve the surface. Bermuda is never top-dressed unless the weather is warm and the grass growing vigorously.

"My objection to playing on the greens all the year round and planting them into winter grasses is as follows. Bermuda grass grows in warm latitudes wherever air can get to the roots. It will grow on a pile of sand or cinders. On the clay soil which we have here, the continued walking over and mowing the greens during the spring, summer, and fall pack the soil almost solid. If the soil is not loosened in the winter, the following

year the grass is not nearly so vigorous, a bare spot develops, the Bermuda is not strong enough to cover it up, and crab grass or other weeds take possession. This goes on with increasing rapidity until you have a crab grass green.

"Bermuda is the last grass that begins to grow in the spring. Like cotton, it must have heat and plenty of it. A cover crop of winter grass over the Bermuda shades it and keeps it cool, and it does not begin to grow until long after the uncovered Bermuda is up and thriving. This delay naturally gives other grasses and weeds a dandy chance to take possession.

"Why artificial watering kills Bermuda turf is a problem for experts. I only know that the turf begins to sicken after a few treatments, and that ultimately it will give up the struggle to crab grass and weeds. Not until a Bermuda green has absolutely gone to the bad will I put water on it. This is then done with no hope of reviving the Bermuda, but only to grow some sort of vegetation on the green to get by the season when the green can be renovated.

"My method has been successful here for the last six years, while clubs both here and in Nashville have practically lost their Bermuda greens by planting them in winter grass and playing on them all winter."—*Hugh H. Miller, Colonial Country Club, Memphis, Tenn.*

"Our work on the Bermuda greens starts in the fall after the frost, when we apply a heavy top-dressing of sharp sand. About the latter part of February, when the danger of frost is gone, we fork the greens and take off as much of the old Bermuda grass as can be raked off, then top-dress with either cottonseed meal or ammonium sulfate and a good sandy loam. The rest of the season we top-dress with loam once a month and cut the greens every day. We water in the evening when needed about twice a week during the hot, dry weather. This is not really necessary unless you want to keep the greens fairly soft and green. Our experience in using winter grass was disastrous, as it brought on brown-patch the next summer. Since we have stopped using rye and redtop we have not been bothered with brown-patch. You would be surprised to see what wonderful fairways we have also obtained by the use of ammonium sulfate. About thirty tons did the work for the entire course. Briefly, our method is to top-dress, using ammonium sulfate and watering when needed. We have to use a tremendous amount of water after ammonium sulfate to prevent burning. In the summer we do not use ammonium sulfate but simply top-dress with sandy loam. It is not necessary to keep the greens soaked. This in a way keeps down the growth and gives us a keen, true putting surface for some time. We have used ammonium sulfate all over our fairways with a wonderful result. Continued heavy watering and the use of fertilizer during the summer season makes the grass entirely too rank, and doubtless this is the reason why some of the growers of Bermuda turf have cautioned against the practice. We cut our Bermuda greens at least once a day with a close-cutting mowing machine to prevent the grass from getting long and crisp."—*C. B. Buxton, Dallas Country Club, Dallas, Texas.*

"In regard to forking Bermuda greens, it is undoubtedly the best procedure where a green has become over-hard, as an alternative to tearing up the whole green. In opening the turf, however, the holes should be filled with a good compost, preferably screened cow manure, since one of the first principles of making a good Bermuda green is that the soil shall be loose enough in texture to allow the runners to spread.

"Artificial watering has a tendency to make Bermuda very coarse, and it also keeps the runners near the surface. Nothing compares with a good rich compost; it gives the grass not only a richer color but a finer texture. Bermuda seems to respond very well to the use of cottonseed meal or tankage.

"Particular attention should be paid to mowing. The closeness all depends on the amount of Bermuda there is in the green. When the grass is scanty the knives should be raised a trifle, but if the grass is abundant the knives should be let down and close cutting should be the rule, as it forms a much finer mat. If the runners are left too high the green becomes too stubbly and never has the rich olive-green color.

"I am not yet ready to give my opinion on sowing greens for winter play. I am trying it out for the first time this winter, on the regular summer greens. I will tell you our experience later. Last winter I planted winter grass off to one side of our regular greens, and I will say that the Bermuda which came through in the spring was much finer than at any other place.

"One thing I can not quite understand is why our greens are never as good during the whole season as they become at this time of the year (October). The grass is now finer and much thicker."—*Howard Beckett, Capital City Club, Atlanta, Ga.*

"In our southwestern section of the country many clubs are still tolerating sand greens which can afford, and should by all means have grass greens. Thus far Bermuda grass has proved to be the only practical grass for greens in this section. An important consideration in this respect however is the strain of Bermuda grass selected for the purpose, as it has been found that certain strains, particularly the Atlanta strain, possess marked superiority. A little time and trouble spent in the selection of the better strains will yield handsome returns.

"When installing a Bermuda green, choose sandy soil if possible. Grade the green during the winter months, and be ready to plant the grass upon the approach of spring. The earlier in the season the planting is done the better. A period of 100 to 120 days of growing weather is usually sufficient to bring a green to putting condition. Much better results are obtained when the green is planted from stolons of a superior strain of Bermuda grass than when the green is seeded or sodded. Thick planting of the stolons is a good investment when quick results are desired. From the time the stolons are planted the soil should be kept moist and, most important of all, free from weeds. Begin to mow when the ground is nearly covered with new growth, and mow continuously. Top-dress lightly but frequently until a good turf is formed. My experience during the past season has convinced me of the greater importance of very frequent top-dressing than I formerly believed. The top-dressings should be of the lightest soil possible, containing a high percentage of sand.

"The greens should be cut daily. During the season of fastest growth, cutting twice a day is often advantageous, yielding fine results. Water sufficiently to keep the grass growing luxuriantly."—*P. D. Maxwell, Dornick Hills Country Club, Ardmore, Oklahoma.*

"Referring to your request for a statement from me as to my method of treating Bermuda turf, I must state that I have followed generally the advice contained in *THE BULLETIN* and have never been misled. Our experience with forking has never gone farther than the forking up of small

depressions and bumps, which has been very satisfactory. We have never risked the forking up of an entire green, being without information on that subject. The past two seasons we have seeded our greens in the fall to Italian and perennial rye-grass, Kentucky bluegrass, and Bermuda grass, but this season I am following the advice of THE BULLETIN and am seeding to re-cleaned fancy redtop, which will be quite a saving. We sprinkle the greens every morning lightly to assist in removing the dew from the grass and also to help prevent brown-patch, which by the way, I am glad to say we have never experienced. Also through the winter season, when necessary, we give the greens an all-night soaking which has kept them very beautiful. As for fertilizer, I use tankage and ammonium sulfate mixed with a little top-dressing consisting of a made-up soil, 3 parts of marl to 1 of humus and sand. All of the other courses in this section top-dress in summer with nothing but a black hammock sand, which they can do on account of their greens being flat. As our greens are, however, beautifully contoured, we are obliged to use the clay mixture. In the cutting of Bermuda greens my experience has been that by cutting too close or neglecting to top-dress often enough, the crowns of the plants are cut and the grass dies back, and only by top-dressing and plenty of watering can it be brought back. Without frequent light top-dressing, rather than a single heavy application, the roots of the grass seem to die."—O. S. Baker, *Miami Hialeah Municipal Golf Links, Miami, Florida.*

"I have tried forking only on one green, and while I obtained very good results as far as the growth is concerned, the imprints of the uplifted turf remained on the green for a great length of time and it took more than ordinary top-dressing to cover these places so as to make the green smooth again where the turf was turned from the fork. We also top-dressed with well-rotted cow manure compost, but the final results were no better than if we had used the same rich mixture on the greens in the regular way.

"In regard to winter grass on Bermuda turf, I do not think well of this practice, as in my experience it retards the early spring growth of the Bermuda grass and makes cuppy places later on in the season. It is impossible to keep the winter grass from bunching in spots. The Bermuda does not always quickly cover these spots. We are therefore making our winter greens separate from our Bermuda greens this year.

"I do not believe in too extensive watering of Bermuda grass in a soil as sandy as ours, as there is a tendency to wash the soil away from the roots and produce coarser growth than would obtain in the case of a clay soil. With a clay soil the clay sticks to the joints of the grass, allowing the new growth something to hold to. If it were possible it would be better for us to top-dress after extensive watering, in order as far as possible to replace the soil in which the new shoots from the soil-covered joints may grow.

"The only artificial fertilizer I have tried is sodium nitrate, and this has been only in the case of greens produced from seed, when in the early spring it helps materially. I have also found that a new green can be produced more quickly from seed sown in the early spring on a rich seed bed, provided frequent watering is given, than it can be produced from stolons. My experience has been that seed sown in March will produce a very good turf by the latter part of July."—Arthur W. Solomon, *Savannah Golf Club, Savannah, Georgia.*

"I have found that when a Bermuda green becomes hard and the grass shows signs of retarding of growth, if the green is spade-forked thoroughly and then top-filled, the green seems to take a new lease on life. This is done during the playing season, and while the green is a little bumpy for a while we do not stop playing on it.

"At Druid Hills we have two sets of greens, one winter greens and the other summer greens; or rather, the greens are so large that we split them and sow one-half in winter grass. This year we are using Italian rye grass exclusively. The greens have been sown for about fifty days and are ready to play now (November 8), although our regular Bermuda greens are still in good shape.

"I have found that the best fertilizer for Bermuda greens is one that contains a high percentage of ammonia. We are using cottonseed meal, and sometimes tankage, which runs as high as 10 per cent ammonia. This has given us our best results.

"I have never found that mowing Bermuda greens close hurts them, provided top-filling is done frequently. I think the success with Bermuda greens is based entirely on keeping the soil loose and allowing the small leaves to come through and keeping the vine buried with top-filling. I think we have filled our greens eight or ten times this year.

"Bermuda greens should not be artificially watered, except in long droughts. We had very little rain in Atlanta for the six weeks preceding the present date (November 8), and yet our greens are now in perfect condition.

"On some of our greens I am going to try ammonium sulfate and water. I have just returned from Dallas, Texas, where I saw the prettiest Bermuda greens I ever saw in my life, at the Dallas Country Club, and I was told the greens at the other clubs were equally beautiful. They have been using water and ammonium sulfate, but of course they have a different soil from what we have here."—*Thomas P. Hinman, Druid Hills Golf Club, Atlanta, Georgia.*

"During the season when greens are entirely Bermuda grass, which is from about May 1 to October 15, we use the following method in caring for them. Starting May 1 the greens are treated twice monthly with ammonium sulfate, about 15 pounds to each green. The greens are top-dressed once a month with a mixture of well-rotted cow manure and local top soil, which is screened and well mixed in the proportion of one-third manure and two-thirds soil. The greens are kept well watered; in fact, we try never to let them get real dry at any time. About October 15 we begin seeding our greens with a mixture of redtop and Italian rye grass, and in this way we are able to keep our greens in good playing condition the year round."—*Willie Maguire, Houston Country Club, Houston, Texas.*

COMMENT BY THE EDITORS.—The above reports of experience indicate that two radically different principles are followed by the writers. Some use essentially the same treatment found best for bent greens, namely, top-dressing, ammonium sulfate, and ample water. Others employ a semi-starvation system, namely, using both water and fertilizer to a minimum degree. It may be that the best method will vary with the soil characteristics. In any case it is very desirable that both methods be tested side by side, say the two halves of the same green. We hope every club with Bermuda greens will test the two methods in comparison.