

the hole, hits the caddy, who is holding the pin still in the hole, and the ball drops dead to the hole. The caddy belongs to one of the players not in the tournament. Apparently, according to the rules, there would be no penalty and the ball would be played as it lay. However, I am under the impression that there is or was an old rule to the effect that the caddy at the pin shall be treated the same as the players' own caddy. In other words, while he is holding the pin he belongs to the man who is approaching and is affected by the same penalties.

ANSWER.—Under Rule 32, if the flag is still in the hole and not removed there is no penalty whatever if the ball strikes the flag. The United States Golf Association has ruled on a previous occasion that anyone outside the match who is designated to hold the flag is exempt from any penalties imposed under the rules.

QUESTION.—In a best-ball foursome one side concedes the other seven strokes, the strokes coming on certain holes designated on the back of the score card. The side giving the strokes is in possession of the honor. The next hole is halved in fives. On that particular hole the side with the handicap is entitled to a stroke. Does the honor remain or pass?

ANSWER.—In a handicap match play where players receive strokes on certain holes, the lowest net score made on the hole wins the hole and the honor goes to the player who wins the hole. The handicap man is entitled to the same privileges as the scratch man.

QUESTIONS AND ANSWERS

All questions sent to the Green Committee will be answered in a letter to the writer as promptly as possible. The more interesting of these questions, with concise answers, will appear in this column each month. If your experience leads you to disagree with any answers given in this column, it is your privilege and duty to write to the Green Committee.

While most of the answers are of general application, please bear in mind that each recommendation is intended specifically for the locality designated at the end of the question.

1. CREEPING BENT AS A SOUTHERN TURF GRASS.—A great number of our members are urging us to try creeping bent for our putting greens. Do you think it will be able to stand up in a climate such as ours, particularly during the summer months? (Louisiana.)

ANSWER.—It is practically certain that creeping bent will not survive your summer conditions. You could start these greens in the fall and they would be all right through the winter, but with your hot weather of summer they would be pretty sure to go to pieces even though you were able to keep Bermuda and other plants from invading the greens. Under California conditions—that is, in a relatively dry climate—northern grasses can be pushed much farther south than they can in humid regions. It would be an easy matter for you to test out creeping bent under your conditions, by planting a small plat of it, say 10 or 15 feet square.

2. SEEDING BERMUDA GRASS GREENS; CONSTRUCTING COMPOST BEDS.—We have purchased Arizona Bermuda grass seed for seeding nine new greens

and would be glad to have your advice with regard to soil preparation, fertilizing, and rate of seeding. Our soil is red clay. (South Carolina.)

ANSWER.—On your red clay soil you should grow most excellent Bermuda turf. It will be desirable to incorporate some well-rotted manure in the top few inches of your soil. If you can not obtain rotted manure, use bone meal or cottonseed meal, applying it at the rate of about 15 pounds per 1,000 square feet. The seed should be sown at the rate of 2 pounds per 1,000 square feet. In the further upkeep of your greens, good compost having a fair proportion of sand will be the proper top-dressing to use. Your compost should contain 50 per cent of good top soil, 25 per cent of humus material, preferably manure, and 25 per cent of sharp sand. You will find the bed system much cheaper and more satisfactory than the heap system in making compost. With a large, low heap you can do all of the turning of the material and keep down weeds, by the use of a plow and a harrow. The compost should be screened before being applied to the greens. Compost improves with age. Arizona Bermuda grass seed always contains a considerable percentage of the strain which is being called Atlanta Bermuda and which is the best of all strains for putting greens. A good many golf courses in the south have planted their greens from cuttings of this grass.

3. WINTERHARDINESS OF REDTOP SEEDLINGS.—It has been represented to us that redtop seed may be sown with safety at any time during the winter that the ground is in condition for seeding. If this is correct, may we expect that a hard freeze would not kill the young grass in case the seed sprouted? (New York.)

ANSWER.—We have never seen a case where redtop seedlings have been killed even in midwinter, except where drainage is poor. Therefore, we believe you would be safe in seeding redtop at any time in the winter when the soil is in condition for seeding. The great advantage of early seeding is that in spring the young grass is given a better chance to combat weeds.

4. VALUE OF TOP-DRESSING IN WINTER.—We are planning to open our course in full swing the first of April, and it seems to us that February would be the proper month for top-dressing our greens, although we have been advised that March is soon enough. When is the best time for us to top-dress the greens? (Kentucky.)

ANSWER.—We top-dressed last winter and the results were rather surprising. The grass seemed to show as much benefit from a dressing then as it did in summer. We see no reason at all why you should not top-dress your greens in February if they are in condition to work on at that time.

5. ERADICATING COCO OR NUT-GRASS.—Do you know of any way to get rid of nut-grass on putting greens? We have been trying to dig out this grass but find that it comes back about as fast as we dig it out. (Georgia.)

ANSWER.—This is an extremely difficult weed to eradicate from lawns and putting greens. The plant is spread by the little nuts or tubers, the seeds apparently never being good—at least we have never yet obtained any seed that would germinate. Therefore the logical thing to do would be to get the ground completely free of the nuts before planting the putting green. One way to do this is to put a fence around the ground for a short time and put in some geese. They will find and eat nearly all of the nuts.

It is possible the nuts might be removed by screening the soil, but as some of them are extremely small we doubt if this would be effective. A third possibility would be by sterilizing the soil by use of a steam portable sterilizer, but this is expensive and in the light of our present knowledge we can not recommend it. If the ground is free from the nuts in the first place there would be little or no danger of their finding their way to the putting green. If you have putting greens badly infested, we suspect that if the turf were removed clean to a depth of about 1½ or 2 inches and used as compost for fairways, the ground beneath would be perfectly free of the nuts, and this would probably be the cheapest way of getting rid of the nut-grass in badly contaminated greens, and then of course planting the green anew.

6. TREATMENT AND DRAINAGE FOR WET MUCK LAND WHERE GRASS DOES NOT THRIVE.—The drainage of our No. 8 hole is giving us considerable trouble. This hole slopes from the tee to a brook, and then again downhill beyond the brook. There is a section of this fairway, from the brook beyond the green, of about fifty or sixty yards, which is of a very black, mucky soil. We have drained that in a manner which we supposed would be adequate to dry it out. We then plowed and harrowed and sowed to 50 per cent Kentucky bluegrass and 50 per cent re-cleaned redtop. This portion of the fairway did not dry out as quickly, and this seed made a good start, but after the grass was up about 1½ inches and was of a healthy green, it died down within thirty days and we were obliged to harrow the land again. Thinking the soil contained too much acidity, we sprinkled it with lime, and sowed it again with the same mixture of seed. The grass from this second seeding is now about the same height as that from the first seeding, but it is beginning to show very brown. If this grass does not thrive, what other grass would you suggest seeding on this soil? We believe we have satisfactory drainage. There is however a large hill back of the green and the water soaks into the ground above the green and comes out again at this particular wet place. The fairway at this point is about 70 yards wide. We have in it 8 tile drains, all starting beyond the brook. (Maine.)

ANSWER.—We are inclined to think that your trouble is caused more by the nature of your soil than by poor drainage, although probably both factors are effective. We have found it exceedingly difficult to grow grass on certain muck soils. Frequently it is not difficult to get a good stand of grass, but the grass seedlings turn yellow and die before turf is formed. This is true even where drainage is provided. Lime seems to help but little. If your second seeding is not successful we would suggest that you top-dress your muck fairway with well-rotted manure, or with manure and soil made into a compost after the manner frequently described in *THE BULLETIN*. If a fairly heavy top-dressing, say one-half inch or more thick, is applied, we believe you will be able to grow grass on that particular fairway, provided the drainage is good. If it is necessary to improve your drainage we would suggest that you run a line of tile deep enough at the upper edge of the fairway to cut off the seepage completely. Redtop and bent do fairly well on soils not perfectly drained, but if the soil is too wet for these grasses the only other worth trying is bird grass (*Poa trivialis*), which makes beautiful turf where it succeeds.

7. THE BIRD'S-NEST FUNGUS IN TURF.—I am sending you a small piece of bent turf from one of our greens. You will notice in it a growth

of some nature in all appearance like worm holes. Upon examination you will find these to be growths $\frac{1}{2}$ to $\frac{3}{4}$ inch in length, with well-defined roots. They began to grow about October 1 and are increasing now (November 18) in number. So far there is no damage to the greens except in appearance. (Washington.)

ANSWER.—The cup-shaped or vase-shaped growth in your turf is a species of bird's-nest fungus, known botanically as *Cyathus*. This fungus often occurs on manure and decayed wood or other vegetable matter, but we have never before seen it growing in turf. The only explanation that we can offer for its presence is that you have used manure in excessive amount and in large chunks. We do not think the fungus will injure your grass, although where abundant it may interfere with the putting quality of your turf. We would suggest that for a time you avoid applications of manure, but fertilize your greens with ammonium sulfate. The turf you send is a very nice sample but you seem to be using entirely too much sand in the top-dressing. The top inch of the soil seems to be pure sand. Your top-dressing should be of a loamy nature to give best results.

8. INTRODUCING BENT GRASS INTO BERMUDA GREENS.—This summer we planted four new greens with German mixed bent seed. The grass on these new greens has done splendidly, and from present appearances they will be by far the best greens on our course. We have tried the experiment of raking out the coarse grass on some of the old greens and then top-dressing the green heavily and sowing creeping bent stolons as we would on a new green. The top-dressing stimulated what Bermuda there was left in the old greens, and this went ahead much faster than the bent. However, the bent is coming along nicely now (November), and during the winter season, when the Bermuda is dormant, may prevail. Have you had any experience in converting Bermuda greens into bent greens in this manner? (California.)

ANSWER.—We have never seen Bermuda greens converted into bent greens in the manner you describe, and doubt that it can be done successfully. During the hot weather of summer the Bermuda is very apt to kill out the bent. Greens of other grasses can however readily be converted into bent greens by sowing stolons of creeping bent on the old turf, and then top-dressing.

9. TOBACCO PRODUCTS AND CARBON DISULFID IN ANT CONTROL.—I wish you would be good enough to advise me if tobacco products are effective in the control of ants. (Colorado.)

ANSWER.—We have tried two or more tobacco products and have received reports from golf clubs who have tried others. On the basis of the experience and information obtained we have reached the conclusion that these preparations are not satisfactory for the control of ants. They appear to repel ants for a brief period, but the ants soon return. In fact, they are repelled for only a short time, especially if rain follows the application of the tobacco or the greens are watered shortly afterward. As long as the fresh material is on the surface the ants seem to be repelled, but after it is washed into the turf it seems to have little influence on them. For the control of ants we have found nothing better than the injection of about a teaspoonful of carbon disulfid into each nest. This is a tedious way of ridding greens of ants, but so far it seems to be the most satisfactory. The carbon disulfid may be applied with a spring-bottom oil can. One squirt is sufficient for a nest, and the hole of the nest should be closed immediately after the application. Care should of course be taken to avoid

touching the grass with the carbon disulfid, as it kills the grass with which it comes in contact.

10. CINDERS AS A BED FOR DRAINAGE TILE; DEPTH OF LAYING TILE; SUB-IRRIGATION OF PUTTING GREENS.—We are building a new golf course and are ready to start work on the tiling of the greens. We are not clear however on the following points, and should like to have your opinion. Is it advisable to bury tile in cinders, say approximately 2 inches underneath and on each side with about 6 inches on top? Is a depth of 2½ feet proper for placing the tile? In *THE BULLETIN*, Vol. I (1921), page 85, is an article describing the sub-irrigated greens at the St. Louis Country Club. Have any other experiments been conducted along this line? It seems to us that if we can depend on capillary action of the soil particles, sub-irrigation has many attractive features over the method of sprinkling, since it would appear that we could arrange such a layout so that the water pipes would lead directly into the drainage tile, necessitating merely the opening of a valve so that this irrigation could be done at any time of the day, by laborers on the course, without interfering with play. It would also eliminate the necessity of having hose and sprinklers. (Illinois.)

ANSWER.—We believe it is generally considered that tile buried in coarse cinders is more efficient than tile covered mostly with soil, as in the former case there is much less danger of the joints becoming clogged. The depth for laying the tile is a matter that will vary according to conditions. Two feet is about the minimum. In regard to sub-irrigation by a comprehensive plan such as that employed at the St. Louis Country Club, several clubs have experimented with it but the results have been unsatisfactory. It is a very expensive method and the whole apparatus is likely to become clogged. No evidence has yet been put forward to show that sub-irrigation has any advantage over surface irrigation.

11. LAKE BOTTOM SEDIMENT AS A TOP-DRESSING.—We are forwarding a sample of sediment taken from our lake. Our green committee is anxious to ascertain the chemical analysis of this sample, and your opinion with regard to any possible benefits that might be expected from the use of the sediment as a top-dressing for fairways and sub-surface for greens. (North Carolina.)

ANSWER.—Your sample consists of coarse sand, a considerable amount of silt, and some rather sticky clay. The clay in the sample is too sticky to warrant its use with satisfaction, and we believe that you can find on your course very much better material than this. There is nothing in it to indicate that it has any particular fertilizer value. For top-dressing purposes, texture of the material is the all-important thing. This texture should preferably be that of a loam, or, if your soils are heavy, that of a sandy loam. The expense of a chemical analysis of a soil sample is rarely justified, as it throws no light on its fertilizer value.

12. GETTING RID OF MOSS.—Have you any suggestions as to how we may rid our putting greens of moss? (Connecticut.)

ANSWER.—In our experience we have found that the presence of moss is due to impoverishment of the soil, resulting in an inability of the grass to spread, and that the best corrective measure consists in fertilizing with ammonium sulfate, used either alone or in compost, after the manner which has been described in various places in *THE BULLETIN*.