

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. Texture desired for compost.—We are sending you two samples of soil on which we would appreciate your advice. The sample tied with the black cord represents the texture of our soil from the ninth green; the other, the one with the white cord, is the black dirt with which we have been top-dressing our greens. What we want to know is, do you recommend using sand with the black dirt as a top-dressing for our greens, or would you advise our using it without sand? Should we use something in the form of heavy clay or heavy soil with the black dirt? (Michigan.)

ANSWER.—Your native soil is a silt loam—a fairly desirable type of soil for a golf course. Your top-dressing soil we are not quite able to make out, but we think it would be better if you put in a smaller percentage of sand and perhaps a larger percentage of vegetable material. The vegetable material (leaf mold or well-rotted manure, or both mixed) should never be more than one-fourth of the total constituents, but the whole compost to be of the right texture should be such that it will compress like a ball but break readily apart. Your material looks as if it contains so much sand that it will not hold together when pressed into a ball in the hand. Except for this it looks like good top-dressing material.

2. Spring treatment for improving thin putting green and fairway turf; value and use of top-dressings of compost; value and use of woods soil and cottonseed meal; controlling crab grass; rolling greens.—The soil of our greens consists of four inches or more of rich clay loam containing a little sand from side hill washings, but no additional sand nor any compost were mixed in the soil. On top of this was placed a layer of $\frac{1}{2}$ to 1 inch of leaf-mold obtained from the woods and mixed with sand. The greens were seeded with a mixture of bluegrass, redtop, and fescue. They were top-dressed last year four times with a mixture of two parts of top soil from the woods and one part sand, to which 25 pounds of cottonseed meal were added per green. Early last season the grass on the greens was satisfactory, but toward the end of the season the turf became thin. We have no compost for top-dressing this year but hope to have some ready next year. We still have some of the top soil from the woods available for top-dressing, however. What would you suggest that we mix with it? Would it be advisable to reseed the greens lightly this spring with redtop? Two of our greens were badly infested with crab grass last fall, so badly that if they had been weeded there would have been no grass left. What can you suggest as a remedy for this condition? Would it be advisable for us to take up the sod of these greens and throw it

away and start over again? Is it necessary or advisable to roll greens if they are top-dressed regularly? Is there any advantage in using a spiked roller on greens? The grass on portions of our fairways which are on side hills has not done very well. The soil is clay, and we have more or less trouble from washings. These side hills were fertilized with sheep manure last fall, and this spring we expect to apply additional sheep manure. The grass appears in bunches, probably the result of heavings from frost. (Wisconsin.)

ANSWER.—Most wood soils are good for grass, especially if they can be composted for a short time with manure. We believe that a compost of this kind would be very helpful to your greens. You should get your materials together for a compost pile without delay. Our experience is that excellent results can be obtained by the use of compost and ammonium sulfate as a top-dressing, to be used in place of other fertilizers. As a rule the compost should consist of not to exceed one-fourth organic matter (well-rotted manure or similar materials), and the remainder loam or clay loam and sand. We top-dress our experimental greens at least three times a year, using compost and ammonium sulfate, the latter at the rate of about 3 pounds to 1,000 square feet of surface covered. Ammonium sulfate applied with compost has done more in our experience to thicken the stand of grass than any other treatment we have used. It is certainly much to be preferred to re-seeding. We suggest that one application be made in early spring after the grass starts growing nicely, a second application late in spring, and a third application in early fall. Bear in mind that ammonium sulfate will scorch grass if it is applied too heavily. Cottonseed meal seems to be a good fertilizer for grass. While it is not as quick in its action as ammonium sulfate and does not scorch the grass as readily, yet it does scorch grass if applied improperly. The early spring applications of ammonium sulfate would probably not require the use of water to prevent scorching, but water should be used in connection with the late spring and early fall applications. As for re-seeding greens, we have obtained little benefit from re-seeding, especially in the spring. However, in your part of the country it is possible to thicken thin turf by re-seeding with such grasses as redtop and bent. Bent, of course, is preferable to redtop for greens, but for temporary greens redtop will answer well. The indications are also that by scattering clipped runners of creeping bent in thin turf in the fall, and then top-dressing, the stand of grass will be quickly improved; this plan is, however, still in the experimental stage. Regarding crab grass, the essential thing is to pull out the young plants before they have had a chance to grow and spread. If the weeding is done when the crab grass plants are still seedlings, one laborer can weed as large an area in a day as three can in the same time after the plants have started to spread. We are inclined to think it would be well to consider remaking your badly infested crab grass greens. Crab grass is an annual, developing each spring from seed; but where it has been allowed to flourish the soil is sure to be filled with its seed in the spring. As for your fairways, in the absence of well-rotted stable manure, we would suggest that you apply bone meal at the rate of 500 to 600 pounds to the acre. Most sheep manure we have seen in bags for sale seems to have been badly leached out before it was put on the market. As for rolling, we believe that fairways should be rolled once a year, in the spring, after the frost is out of the ground. We do not regard the spiked roller as a useful implement; in fact, in most cases we advise against its use.

3. **Bermuda grass and Japan clover (lespedeza) for quick results on fairways.**—Our fairways have never been fertilized. The soil is a very heavy clay. For several years the fairways have been gradually getting bare in spots, especially some rather steep inclines. Last December we top-dressed these bare spots with 3 inches of ordinary stable manure. So you may have some idea of the extent of area thus affected I might add that we used for this purpose about 175 loads of manure. It is our intention to rake this manure up with a smooth rake at the beginning of the growing season, about March 1, leaving just sufficient of the manure on the bare spots to be the equivalent of a heavy top-dressing. It is suggested by some that these bare spots then be sown with Bermuda seed. As we are not sure that the sowing of additional seed is called for, I should be glad to have your opinion in the matter. (Tennessee.)

ANSWER.—We would advise you to sow these bare spots with Arizona Bermuda seed, or else plant them with roots or stolons of the Atlanta strain of Bermuda grass. The Arizona Bermuda seed carries only a small percentage of seed of the Atlanta strain. It would be well, therefore, for you to start a nursery of the Atlanta strain of Bermuda grass from runners, in soil entirely free from ordinary Bermuda, in order that you might have pure Atlanta Bermuda for patching purposes. As the planting of the roots or stolons is sometimes somewhat of a nuisance, especially on fairways under use, it might be best for you to seed your bare spots about May 1, or as soon as the summer rains start in. We would also recommend that you sow Japan clover, or lespedeza, along with the Bermuda seed. While Japan clover is an annual, lasting but for one season, it develops rapidly and makes a very satisfactory fairway turf while the Bermuda is getting established.

4. **Thickening turf of putting greens; rate of application of compost and ammonium sulfate.**—We will hold a tournament on our course during the last week in June and are anxious that our greens be in fine condition at that time. Our greens were seeded to German mixed bent. Two of them are in rather poor condition, and while they are slowly improving we doubt that they will be in perfect condition by the time of the tournament. What treatment would you advise to get quick results? (Nebraska.)

ANSWER.—There are two methods by which you can get quick results in thickening your bent turf. The first is by vigorous fertilizing. We would advise vigorous fertilizing by frequent top-dressings and by frequent applications of ammonium sulfate. The ammonium sulfate should be applied at a rate not to exceed 3 pounds per 1,000 square feet, and at half this rate in hot weather, and should be well watered in to prevent burning. The top-dressings should be of compost to which ammonium sulfate has been added, and should be at the rate of about 1 cubic yard to 5,000 square feet. The second method is by seeding the thin spots with redtop, which germinates quickly and makes rapid growth in its young stages. If your greens are in fair condition we are inclined to think that applications of top-dressing and ammonium sulfate will bring them to a fine condition by the end of June. If, however, the turf is in poor condition, we would advise the application of redtop seed.

5. **Architecture of and grasses for tees (northern).**—What is the best type of grass for tees in this section of the country? Our tees are well worn, and we want to reseed or reset them, and would like to know what the toughest

grass is that we can put on the tees to withstand the hard wear. (Ontario.)

ANSWER.—First of all, a tee should be constructed on the natural ground level, where that is practicable. A built-up tee is never desirable except for the purpose of securing visibility or drainage. We consider it much easier to obtain good turf, provided the drainage conditions are naturally good, on a natural ground level than on a raised plateau. Furthermore, on a natural ground level you can mow the tees simply with a fairway mower, and you can also make the area relatively larger so as to provide for changing the location of the tee, a practice which is of great help in the avoidance of excessive wear on a single spot of turf. If you have built-up tees on ground of this character we would suggest that you tear them down and use the natural ground level wherever practicable. If, however, you have some raised-up tees or small built tees which can not well be rebuilt with larger areas, we do not think you can do any better in the matter of grasses on these tees than using the redtop-bluegrass mixture (4 pounds of bluegrass to 1 pound of redtop). In the latitude of Washington it is very desirable to have a tree or group of trees on the south side of a tee where possible in order to shade the tee, not only for the benefit of the golfers, but because grass can be maintained much better in the shade than in the open.

6. Effects of manure and ammonium sulfate on the presence of earthworms.—We have used ammonium sulfate with success in bluegrass turf, in the following manner. Up to midsummer, each time a green was weeded it was dusted with 50 pounds of bone meal mixed with 5 pounds of ammonium sulfate, and then well watered so as to wash the ammonium sulfate into the soil. After that there were very few earthworms in the greens, while previous to this treatment the greens were heavily infested with earthworms. Do you think the use of ammonium sulfate has a tendency to discourage the development of earthworms? (Missouri.)

ANSWER.—The use of ammonium sulfate certainly does tend to discourage earthworms. On the other hand, manure has a tendency to increase the number of earthworms in the soil. In other words, organic substances appear to provide food for the worms, while ammonium sulfate and other chemicals discourage them.

7. Cottonseed hull putting surface to withstand excessive blowing.—We have experienced considerable difficulty in keeping sand on our putting surfaces on account of excessive wind which we have at certain seasons of the year. In *THE BULLETIN*, March 1924, page 77, is an article describing cottonseed hull greens at El Paso, Texas. Do you know whether a cottonseed hull surface will withstand excessive winds, and what the cost of the hulls is? (Wyoming.)

ANSWER.—Reports we have from El Paso indicate that the cottonseed hull surface is successful in withstanding heavy winds. The hulls are said to sell for about \$14 a ton in car lots at El Paso. It takes about 2 tons of hulls for a putting green. Best results are secured when the mat of hulls is laid about 1½ inches thick.