

Questions and Answers

All questions sent to the Green Committee will be answered as promptly as possible in a letter to the writer. 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 answer given in this column, it is your privilege and duty to write to the Green Committee. *Please bear in mind that the recommendations given apply specifically to the locality designated at the end of the question.*

1. **Do not cut the grass in your bent nursery rows.**—Some of the carpet bent grass that we planted vegetatively last autumn is now over a foot high. Do you recommend letting this grass grow and seed itself, or cut it down close and depend upon the creeping of the roots for the extension?—(Maryland.)

Let your creeping bent alone until about the end of August; then get busy to make your vegetative plantings as described in the July (1921) number of THE BULLETIN. You will need the utmost growth available during the summer so as to get the long runners, which are the easiest to lift and to chop up for the broadcast plantings.

2. **The eradication of crab grass.**—In the latter part of July of each year, crab (fall) grass makes its appearance in great quantities in our putting-greens and fairways. This necessitates putting a gang of men on the greens and digging it out by the roots. After this is done, the greens are in very poor shape for about two months. Could you suggest any method of treatment in the spring that would keep the crab grass out of the greens? Would you suggest not cutting the greens so close?—(Pennsylvania.)

Crab grass in the latitudes of Washington and Philadelphia is exceedingly troublesome as a weed, especially in putting-greens, and we do not know of any royal road to success in eradicating it. The best method we have found for keeping crab grass in check is to fertilize the greens well, preferably with good top-dressing of compost such as is described in the April (1921) number of THE BULLETIN. As soon as the grass appears, remove it by hand. After the grass becomes fairly well established in putting-greens its eradication invariably leaves the greens in a ragged condition; therefore the advisability of starting early. By top-dressing, let us say once a month from spring until the time crab-grass becomes evident, it is possible to so stimulate the grass as to lessen the abundance of crab grass in the greens. We have had numerous reports on the effects of raking, and there are special rakes for this purpose. We are not prepared, however, to recommend this method unqualifiedly, particularly because we have had no personal experience with it and also because of the fact that in connection with its use the turf is quite badly torn. In the hot, dry weather of summer this is not always desirable.

3. **Determination of the amount of plant food extracted from soil by the growing crop.**—I would like to inquire whether or not any experiments have been conducted with a view to determining the amount of plant food extracted from a putting-green during the course of a season? Would the following experiment lead to any reliable conclusions? Suppose I take say the green that comes nearest to being ideal with regard to the turf that we have, measure the green accurately, and throughout the season try to mow when the dew is absent, and keep a record of weights of grass that is cut off each mowing; and then take a sample say every two weeks of the fresh grass clippings and have it analyzed for moisture so as to ascertain the amount of dry matter and also the amounts of such plant foods as nitrogen, phosphorus, potassium, calcium, etc.—(Michigan.)

The question you bring up is that involved in the old so-called "bank account" theory of fertility, namely, that there is a definite amount of nitrogen, phosphorus, potassium, calcium, etc., in the soil and that every bit of vegetation removed as a crop reduces the supply in the soil just that much. An enormous amount of agricultural experimenting has been done on the basis of this assumption. This has resulted in a large stock of knowledge on the amount of salts removed from the land by its crops, and, in related experiments, in the amount of salts removed by leaching. The practical value of these investigations is very small. The amount of salts removed by cropping or by leaching has not been found to be a definite index as to the amount of fertilizer that should be applied, which was one of the things hoped for in connection with such experiments. So far as a golf course is concerned, there is no danger of wasting any fertilizer value which may be contained in grass clippings if these are used in the compost heaps.

4. Eradication of daisies.—Our club is very much bothered with daisies on our greens, and we have tried every method we can think of to eradicate this hindrance but to date have not been successful, and we would appreciate very much your advising us as to whether or not you know of any method by which we can rid the greens of this pest.—(Oregon.)

We know of no easy way to get rid of this pest. Where it is not too troublesome, weeding will probably keep it in check, but where there is a bad growth of the weed it is probably best to lift the sod and replace it with clean turf. For this purpose we advise every club to have a piece of good turf for patching purposes. It is not necessary to go to the expense that is required in building a putting-green to do this, and it will be found to pay for itself many times, to say nothing of the satisfaction of being able to repair the greens with a minimum loss of use.

5. Carbon dioxide as a stimulant to plant growth.—We have seen it stated that the confining of carbon dioxide gas beneath light-excluding covers on turf will greatly stimulate the growth of the grass. Is this practicable?—(Pennsylvania.)

It has long been known that green plants, that is, plants with green coloring matter in their leaves, can use more carbon dioxide than is present normally in the atmosphere provided they have an abundance of sunlight and water. This fact has been well established by laboratory tests. However, the problem of utilizing the gas economically is a very difficult one. It has been suggested that possibly carbon dioxide may be used in greenhouses, but it is very doubtful if it will ever be used economically in open fields. The gas diffuses so quickly that it would require a large supply really to be beneficial. In greenhouses, of course, the gas would be confined, and there would also be plenty of light for its assimilation by the plants. Green plants can not utilize carbon dioxide in the absence of light, and therefore the proposal would appear to be valueless, because it involves the covering of turf with a light-excluding canvas or oilcloth. An excess of carbon dioxide in the absence of light has a tendency to be detrimental rather than beneficial. While we do not wish to discourage any experiments that have indications of being more or less well founded, we do not think the one here suggested would be worth while, since it violates one of the fundamental principles of plant physiology, which is that light is necessary for the assimilation of carbon from the air in the manufacture of organic compounds through the agency of the green coloring matter

known as *chlorophyll*. It may be well, however, to remember that one of the functions of barnyard manure, or indeed of any soil material rich in humus, is, through its decay, the supplying of large quantities of carbon dioxide to the soil. There can be but little doubt that this is one of the reasons why humus materials stimulate the growth of plants. All in all, this would seem to be by far the most practicable way of increasing the amount of carbon dioxide available for plant growth.

6. **Eradication of pennywort; salt in weed eradication.**—We mailed you yesterday a box containing some sod with a flat weed in it. It is giving us a great deal of trouble; in fact, it is ruining our greens, as when it takes possession it kills out the Bermuda grass. Can you recommend some chemical which will kill this weed without taking any chance of damaging the Bermuda grass?—(Mississippi.)

The weed you sent in for identification is one of the pennyworts. This causes a great deal of trouble in lawns and fine turf on golf courses. Unfortunately we have never discovered a good remedy for fighting it. We believe it would be worth your while to experiment by spraying with an ordinary solution of common table salt. You could apply it with one of the ordinary hand-spray outfits such as used in gardens for spraying vegetables. We would advise starting with a solution of about 3 per cent by weight, and increase it to 5 per cent or 6 per cent if the grass will stand it that strong. Grasses will usually stand more salt than will the broad-leaved plants like the weeds you have; but it will be necessary to work carefully with the spray or the grass will be injured.

7. **Applying nitrate of soda to putting-greens.**—How much nitrate of soda should be applied to ordinary greens where we want a quick, thick growth? How is it best to apply nitrate of soda—in its ordinary form, or dissolved in water?—(Illinois.)

We have recommended that nitrate of soda never be used in single applications to a greater amount than 5 pounds to one thousand square feet. It can be applied by dissolving it in a solution of 1 pound to 10 gallons of water and then sprinkled on with a sprinkling can. The green should be well watered immediately after the application of the material, as otherwise the solution which is on the leaves becomes strengthened as the water evaporates, and this will cause burning. A better way in our judgment is to mix the nitrate of soda, well pulverized, with many times its amount of sand, and then scatter the mixture over the green, after which the green should be sprinkled. Five pounds to one thousand square feet is a fairly heavy application, but this may be applied every month of the year if desired. If the applications are made monthly we would suggest, however, that it would be better to reduce the application to just about half of what is above indicated.

8. **Bee hills on turf.**—We send you by parcels post a sample bee which we have found boring holes in our fairways, especially the part that has been resown last year and heavily fertilized. The fairway is near a woods. The holes resemble the ant holes only they are very much larger holes, and the earth piles are quite bigger. One fairway is quite infested with these. Any information you can give us will be much appreciated.—(New Jersey.)

The bee sent with your letter of recent date is a species of *Colletes*. The holes and piles of earth now appearing in your fairway and caused by the insect are the exits made by the mature insects, which do not return to these same burrows; it will therefore be useless to treat these burrows for the destruction of the insect, and all you can do is to brush or wash

the hills away. The mature insects dig out of the ground in March or April, mate, and the male dies, but the female returns to the same grounds from the latter part of April to June, burrows again into the soil for a depth of two to three feet, deposits her eggs in the bottom of the burrow, and makes several returns to the burrow during the season to deposit pollen and other food for the next brood. By the following March or April the new brood is ready to dig itself out. The work of this insect in golf turf has never been brought to our attention before. The insect does not feed on the grass roots, and its only injury to the turf appears to be the unsightly hills which it constructs as its burrows. If these hills are objectionable we would advise the adoption of measures to destroy the eggs or newly hatched insects in the burrows. The burrows are, however, rather deep, and to combat the insect successfully would probably require a soil injector, by means of which carbon bisulfid could be injected a foot or more beneath the surface of the soil. It might be, however, that by squirting about a half-ounce of carbon bisulfid down the new holes bored by the bee from the latter part of April to June, and closing the mouth of the hole securely with soil, the eggs or newly-hatched insects can be destroyed. It is possible also that about 2 ounces of sodium cyanide solution of 8 ounces to 50 gallons of water, as recommended on page 233 of the November, 1921, BULLETIN, might be effective. The problem is to destroy the new life deposited into the ground by the females in late spring, so as to prevent the depredations of a new brood next spring. As above stated, this is the first time this matter has been brought to our attention, and all that we can suggest is experimentation along the above lines, if you care to go to the expense and if the situation is so serious as to warrant it.

9. **Top-dressing of greens with sand.**—At our new club, which we will start using this fall, we have built in our greens, using a top layer of equal parts of humus, top soil and sand. Three of the greens although constructed in the same manner as the rest, get harder than the others. We attribute this to the fact that that section of the ground upon which these greens are built is of a heavier clay texture, which is more plastic, and the top soil in that section is thinner and poorer than that which went into the other greens, consequently there should have been more humus and sand incorporated in it to make it of the proper consistency. The top-dressing used this spring was composed of three parts compost (sod, humus, garden soil and well-rotted manure) to one part sand, and we expect to use this application lightly two or three times through the season. It, however, occurred to us that on the greens which have shown the tendency to harden, a bigger percentage of humus and sand should be used. Would a light application of sand alone, or just sand and humus, be beneficial to the greens in question?—(Minnesota.)

You are probably correct in your statement that the three greens that get harder than the others are composed of the more plastic soil, and on these greens it might be well to be very liberal in your top-dressings of sand, and indeed to continue with top-dressings, mainly of sand, until the surface texture is considerably changed. To make the whole matter more concise: (1) Use sand top-dressings on greens which are composed of a rather heavy clay or clay loam, as this top layer of sand will bring about better water absorption and reduce very materially the tendency of such soils to puddle and bake; (2) where the general growth of the soil and the putting-green is already satisfactory, use just such a mixture as you have been using for your top-dressing.