## 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. Draining a green to take care of seepage from an adjacent hillside.**—In your February, 1924, BULLETIN, you recommend that a grassy hollow be constructed in order to take care of hill seepage, as being a better plan than to put tile down, covered with rubble from the tile up to a point near the surface of the ground. A year ago we treated a green by the latter method. We made a ditch about 4 feet deep, put in 6-inch common drain-tile, and covered the tile with cinders up to within 8 inches of the surface, and then sodded it over. This seemed to give us good results, and we intend to treat two more greens the same way this spring. These two greens are backed too closely by trees to permit the putting in of a grassy hollow, and if we do anything it will have to be with tile. What specific objection do you have to this method? (Indiana.)

ANSWER.—In order to take care of the seepage from the hillside where it is impracticable to put in either a grassy hollow or a bunker, the matter can be attended to by using tile and rubble. Dig a trench deep enough to get well below the level of the green so that the seepage water that comes out below your trench will not be too near the surface of the green. The lowest part of your green ought to be 1½ to 2 feet above the bottom of the trench. To secure satisfactory drainage with tiles there should be a series of tiles, one laid over the other from the bottom up, particularly well toward the top, so as to take care of the water at all the levels. These layers of tiles can be a foot apart; that is, each line should be a foot above the other, and the intervals filled with rubble. If you put in only one layer at the bottom of the trench, enough water will escape over that layer to give you a soggy condition of the green; at least this frequently happens; but with a battery of lines of tiles one above the other it is possible to cut off the seepage water completely. It is possible that you could do the whole job, and we think it entirely practicable, with coarse rubble. Cinders, we fear, are too fine, as after a while they clog up with silt and then satisfactory drainage ceases.

**2. Recurrence of white grubs on land previously infested.**—Last summer the fairway and rough on four of our holes were infested with white grubs and upon your recommendation we tried the sodium cyanide treatment. This year the grubs have not appeared on any of the fairways, but have appeared in several places just off the fairway where the ground is relatively high. They are found at from 3 to 10 inches below the surface. Do you think that we will have trouble over the large area that we had last year and would you recommend treating them in the same way? (Massachusetts.)

ANSWER.—On this point the Department of Agriculture advises us as follows: "Judging from our knowledge of the emergence of the various broods of May beetles, which lay the eggs producing white grubs, it seems very likely that the beetles of 1924 were responsible for the grubs which are present this year near the fairways and that these grubs will mature in the spring of 1926, producing beetles during the spring of 1927. As white grubs are not known to migrate through the soil to any great distance it seems probable that these particular grubs are not likely to cause further damage to the golf links and that no general damage from grubs is to be expected until the summers of 1927 and 1928. Of course, this is merely a guess based on our general knowledge of the subject, but we believe that this will generally hold true."

**3. Corrosive sublimate in the control of earthworms.**—What is an effective and at the same time safe amount of corrosive sublimate to use on putting greens to kill earthworms? Is it better to apply it mixed with sand and then watered in, or to apply it in the form of a solution? (New Jersey.)

ANSWER.—We have had best results by dissolving 2 to 3 ounces of corrosive sublimate in 50 gallons of water and applying this solution to 1,000 square feet of putting green, and then watering the area thoroughly. In very hot weather of midsummer such an application requires careful attention, particularly with regard to watering, as otherwise it is likely to scorch the grass; in the spring and fall, however, we have had no trouble in this respect. Others prefer the dry method of application, using the same rate of application. The quantity of sand we have used in our tests of the dry method is from 1/3 to 1/5 cubic yard per 1,000 square feet. Unless you have a distributor to use in applying the dry mixture we would recommend that you make use of a solution.

**4. Controlling dandelions in putting greens.**—In THE BULLETIN, April, 1924, page 107, you recommend iron sulfate for killing dandelions. Would it be safe to use it on greens without danger of injuring the turf? Our greens are bluegrass and redtop. We have tried sulfuric acid, but the weeds are such a pest all over the country here that we had no success with it, just relief for about three weeks at a time after treating. Is iron sulfate a sure death for them with continuous treatment for one season? (North Dakota.)

ANSWER.—We would not advise the use of iron sulfate on putting greens, although we are sure it can be used without serious effects to the grass. However, when used in this way it is not likely to be sufficiently strong to kill dandelions. The only methods we have found dependable for ridding greens of dandelions are cutting the plants out by hand, taking care to remove all of the deep root, and treating each plant with a small quantity of sulfuric acid. These are both very tedious and expensive methods, but they seem to be the only ones that are satisfactory.

**5. Use of sulfate of ammonia in relation to new seedings.**—Would you advise putting any sulfate of ammonia on our fairways before seeding? (New York.)

ANSWER.—We would suggest that you defer the application of sulfate of ammonia until the grass has made a fairly good start. This is a very quick-acting fertilizer and its effects are not lasting. Therefore if the

fertilizer is applied before the grass can avail itself of its value or before the growing season has begun, its effect is apt to be lost. Furthermore, germinating grass seeds and grass seedlings are less able to resist the burning effect of sulfate of ammonia than is established grass, and therefore may possibly be killed by the chemical.

**6. Close mowing of fairways.**—We are seeking for some information as to how close it is safe to mow the fairways on the average golf course. We have noticed the past three or four years that the operators usually set their cutting knife down as close to the ground as it will go, and the uneven surface causes the cutting reel to cut the grass down into the roots, and in many places scales the sod, leaving large bare spots. It seems to us there is great danger of serious damage to the turf to cut so close during the summer months; besides, it does not leave a desirable turf for the players. We have had letters from two or three clubs stating that they set their cutting units to cut their fairways a quarter of an inch from the surface—that is, to set the lower knife blade a quarter of an inch from the ground, and in experimenting here the last few days with cutting units set a quarter of an inch the knife plowed into the uneven surface and the cutting reel took the grass out by the roots. We have, therefore, concluded that setting the knife blade a half-inch from the surface of the ground is as close as any mower should be run and as close as any fairway should be cut without too much injury to the grass. What is your advice in the matter? (Minnesota.)

ANSWER.—In regard to mowing fairways we do not think any harm is ever done no matter how close they are cut, provided the grass is not crowned by mowing or that the grass is cut entirely out, as frequently happens on ridges. Crowning is always undesirable, whether on the fairways or on the putting greens.

**7. Improving greens where the growing season is short.**—Our playing season is limited practically to July and August, and as we generally have no real spring or fall weather here, it leaves but one month, June, of growing weather on which we can count to get our greens in shape. We have enough creeping bent in our nursery to furnish stolons for at least five greens, but it is not at all likely that we could have greens ready for summer play by planting them with stolons in the spring. In view of this condition what can you suggest in the way of putting our putting greens in good shape for play this summer? (Colorado.)

ANSWER.—We would advise you to save your bent stolons for use in planting greens this fall and seed your greens as early as possible in the spring with German mixed bent or Rhode Island bent, using the seed at the rate of 3 pounds to 1,000 square feet, or possibly at a somewhat heavier rate. If you sow this seed on your greens after they are closely cut, and follow that with a top-dressing of 1 cubic yard of well-screened compost to about 2,500 square feet, and keep the greens fairly moist, we believe you will get very good results. For purposes of economy you could replace one-third of the bent seed with redtop seed and still get very good results, as redtop seed is much cheaper than bent. Your compost should consist of about one-fourth well-rotted manure and the balance about equal parts of loam or clay loam and sand. Fall seeding is much more satisfactory than spring seeding, although the latter can be made to answer.

**8. Exterminating ants with carbon disulfid.**—During the past season we were greatly troubled with ants in our putting greens and fairways. Our method of exterminating these insects was by treating granulated sugar with arsenate of lead. This method was only fairly successful. We are desirous of having your opinion as to the proper method of exterminating ants from greens and fairways, and wish to know whether corn meal treated with barium carbonate is effective and whether this poison will in any way do injury to fine grasses. (Iowa.)

ANSWER.—There has never been discovered a good remedy for ants. Poisoned bait will reduce their numbers, but no method of poisoning has been found that will completely exterminate the pests. For putting greens we believe the best and safest method to follow is to take carbon disulfid in an ordinary spring-bottom oil can and squirt a few drops of it directly into the opening in the colony. A man doing this work should have several burlap bags soaking wet to drag along and cover the places treated as soon as the liquid is injected into the holes. Carbon disulfid forms a heavy gas that will kill all animal life if kept confined in it. This gas is somewhat explosive, so that it is a good plan to warn the laborers not to light their pipes while using it. It is a rather slow method, but it gets the ants, and we believe that in the long run it is the most satisfactory way to handle them.

**9. Controlling Poa annua.**—For a number of years we have been troubled from June to September with a considerable amount of *Poa annua* in our greens. While we realize that this does not hurt the putting condition of the green, if it is possible to get rid of the *Poa annua* we should like to do so. (New York.)

ANSWER.—It has been our experience that the application of ammonium sulfate will in the course of a few years rid bent greens of *Poa annua.* Applications should be made at least three times a year, once in early spring and once in the fall at the rate of 3 pounds to 1,000 square feet, and once in midsummer at the rate of 1½ pounds to 1,000 square feet. Heavier applications will burn the grass. The applications must be well watered in if burning is to be avoided when made at these rates. We have obtained the best results when applying the ammonium sulfate mixed with compost. The *Poa annua* can also be controlled by weeding it out in late winter or early spring, before it produces much seed. Mowers and other implements used on the greens should be washed or otherwise cleansed of *Poa annua* seed in order to prevent the spreading of the grass.

**10. How often should cups be changed?**—What is the standard practice with regard to frequency of changing the cups on a green? (California.)

ANSWER.—We are inclined to hazard the statement that in general the oftener the cups are changed, the better. At any rate, the cups should be changed frequently enough so that the turf around them does not become badly worn. This will vary under conditions. In soggy weather the turf gets pretty badly used up in one or two days. Under other conditions the turf will stand the wear and tear easily for a week. Generally speaking, we think it will be well to adopt the policy of changing the cups every day or every two days. In any event, your best guidance will be the wear and tear of the turf.