

of the Plainfield Country Club, Plainfield, New Jersey, which issues two leaflets, one a letter to members from the Committee on Caddies, the other *Instructions for Caddies and Information for Players*.

These are all steps in the right direction, and every golf club should encourage the movement. Perhaps some organizing genius can induce all the clubs to join in a unified effort to help caddies not only to become more efficient as caddies for the good of the game but also to become worthy and successful men.

A VALUABLE TRACTOR CATALOGUE

The Implement and Tractor Trade Journal, of Kansas City, Mo., issues an exceedingly valuable catalogue, entitled "Cooperative Tractor Catalog. An Exposition of Power Farming Machinery." The seventh annual edition is now available. Along with other information valuable to green committees it contains the complete reports on all tractors tested at the University of Nebraska up to May, 1922. The catalogue as a whole is a splendid compendium on all sorts of tractor information. Sections on the following subjects of interest to golf clubs are found listed in the table of contents: Illustrated tractor specifications, 48 pages; tabulated tractor specifications, 17 pages; report of Nebraska state tractor tests, 71 pages; tractor accessory and parts manufacturers, 43 pages; first aid to the tractor, 3 pages; tractor harrow, plow, and motor specifications, 14 pages; tractor piston ring and spark plug sizes, 5 pages; motor trucks, 8 pages; electric lighting plants, 3 pages; how good roads are built, 2 pages.

New Member Clubs of the Green Section

(For Previous List See Page 190 of This Volume)

Oak Hill Country Club, Fitchburg, Mass.
 Fenimore Country Club, White Plains, N. Y.
 West Side Tennis Club, Forest Hills, N. Y.
 Niagara Falls Country Club, Niagara Falls, N. Y.
 Lynnhaven Country Club, Norfolk, Va.
 Columbus Lodge No. 37, B. P. O. E., Columbus, Ohio.
 Oberlin Golf Club, Oberlin, Ohio.
 Zanesville Golf Club, Zanesville, Ohio.
 Gogebic Country Club, Ironwood, Mich.
 Leland Country Club, Leland, Mich.
 Glen Flora Country Club, Lake Forest, Ill.
 Antelope Golf Club, Lincoln, Nebr.
 Corpus Christi Golf and Country Club, Corpus Christi, Texas.

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.

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. Checking ravages of "seventeen-year locusts" on golf courses.—We are very anxious to obtain any information you may have on "seventeen-year locusts." Already several golf clubs, having noticed that a number of trees on their grounds are beginning to show the effects of this pest, have asked us if anything can be done in the matter. Do you know of any method of checking the destructive work of these locusts?—(Illinois.)

There is a brood of seventeen-year locusts due in northern Illinois this year, and their arrival is what is probably causing the trouble. There is no remedy for handling this pest, but usually the damage is only temporary. The twigs in which they deposit their eggs are killed and they will

eventually drop off, but the trees will not be killed, and as the pest does not come except at rare intervals it has to be borne with patience. There is really nothing that can be done to stop them.

2. Soil analyses.—We desire to learn how it is best for us to have a chemical analysis made of the character of our soil for the purpose of determining how it should be fertilized.—(Missouri.)

Chemical analyses of soils cost far more than they are worth. The theory that soils can be analyzed and their fertilizer requirements definitely determined, also their suitability for crops, is practically abandoned. An examination of a sample of soil, however, if it is a representative sample, will give one who has had some experience with the treatment of soils a rather definite idea of what treatment this particular soil should have. A practical man looking at your soil as it is on your golf course could do much more in the way of making helpful suggestions for its treatment than could a chemist after he had made a chemical analysis. We should be pleased to examine a typical sample of your soil, although it is not possible to determine as much from a sample as from examination of the land itself.

3. Canada bluegrass, sheep's fescue, English rye-grass, and timothy in a fairway seed mixture.—I am enclosing a sample of a seed mixture recommended to us for our fairways. Will you kindly advise what the mixture consists of and its suitability for fairway use?—(Pennsylvania.)

Your sample is a mixture of Canada bluegrass, redtop, sheep's fescue, English rye-grass, and timothy, the first two preponderating. We do not consider this a suitable mixture for your fairways. Timothy and sheep's fescue have no place in a fairway, neither has Canada bluegrass where other grasses can be grown. If your fairway soil is sufficiently good to produce satisfactory turf we think you will find a mixture of Kentucky bluegrass and redtop, in the proportion of 4 parts of the former to 1 part of the latter, more satisfactory.

4. Well water for irrigation purposes.—Our water system consists of wells piped to an underground tank, and the water goes from the tank to the sprinklers without reaching the air. Is there any danger of watering greens with water that has not been exposed to the air?—(Virginia.)

The problem of deep well water for putting greens has often been brought up, but we have never observed any deleterious results unless the water is highly charged with minerals, particularly sulfur. If it is good drinking water we do not think that you will have any trouble from the quality of the water.

5. Compost from pine needles and forest leaves.—Will you kindly advise us with regard to the use of pine needles in making of compost, as we believe they contain more or less resin, which would be poisonous to grass?—(Maine.)

It is a common practice of farmers in eastern Virginia to use pine needles to add humus to the soil. For putting greens our advice would be to use the pine needles for about one-fourth of the organic matter put into the compost pile. Leaves from deciduous trees—that is, maples, oaks, etc.—make much better compost than do pine needles. You are probably familiar with pine forests and know that there is very little vegetation under a pine tree. This is partly due to the dense shade, but the toxic

matters in the pine needles and their slowness in decay are also contributing factors. If there are any ravines or hollows in your woods there is usually quite a thick layer of rich soil at the bottom which is excellent for the compost pile. But in the use of any of these materials it is advisable to apply some stable manure on account of the bacterial life which it supplies and which is usually absent from other forms of organic matter.

6. **Watering putting-greens.**—We understand that it is better to flood greens twice a week rather than sprinkle them every day. Just what is meant by flooding the green?—(Illinois.)

No definite statement can be made as to the amount of water to be used or the frequency of application. The idea now generally held is to soak your green thoroughly whenever it is necessary to water. This is preferable to continuous slight wettings. The amount of water and frequency of application depend upon the weather and in a large part upon the character of the soil and the drainage.

7. **Use of English bluegrass or meadow fescue.**—Would you be so kind as to tell us what English bluegrass is? Is meadow grass or meadow fescue the same as English bluegrass? What is the nature of the grass, and what are its merits? Is it any good on a golf course?—(Iowa.)

English bluegrass is meadow-fescue. This is a rather coarse, tufted hay grass which much resembles Italian rye-grass. It grows well on wet soils but has little value for golf course purposes. It persists on a putting-green and is almost impossible to eradicate without injuring the turf. Because of its relative coarseness and inability to make continuous turf it is of doubtful value on the golf courses of this country.

8. **Drainage and layering in reconstructing puttings-greens.**—The greens of our club are in a wretched condition, and it is our intention to reconstruct a certain number of them during the ensuing year. It is desired that the reconstruction work be completed prior to August 1st, thereafter followed by the seeding in the early part of September. The vegetative method of securing green turf is being given consideration. Our green committee has given considerable thought and study to the form of green construction applicable to this section of the country, and the following plan has been tentatively adopted:

1—*Subsoil*: The natural subsoil which underlies the course is a heavy, tenacious yellow clay practically impervious to water. It is proposed to remove the present top soil and then bring the subsoil to such a grade that a definite watershed will be provided; it being evident that if depressions are left in the subgrade, water-pockets will result, and by reason of the character of the subsoil such water would remain for a considerable length of time before disappearing through absorption, or from such slight seepage as might take place.

2—*Subdrainage*: We are convinced that efficient subdrainage is a necessity, and at this moment rather feel that the introduction of a porous layer between the subsoil and the topsoil is required to obtain this essential feature. It is our thought that if the porous layer is not provided, the surplus water will remain for an undesirable length of time in the topsoil and thereby produce a water-logged condition. It is possible that some of the surplus water will clear through the topsoil by seepage, which would probably produce an undesirable condition at the lower elevations of the green.

3—*Top soil*: It is proposed to provide a top-soil layer of composted material of at least 8 inches in thickness, the surface of the same being properly formed to provide a drainage plane substantially parallel to the established grade of the subsoil.—(Ohio.)

Would it not be advisable to take care of the drainage by lines of drain tile through the green rather than attempt to bring the surface of the subsoil to a definite grade? We are inclined to think that you could accomplish your purpose with drain tile much easier that way, and it would

eventually prove more satisfactory as a means of drainage. There is no question but what a large part of the troubles of growing fine turf come from improper drainage, and the condition which you describe will tend to keep a green in a water-logged condition. We think that there is no doubt but what your plan would succeed for a while, but we believe it would be more expensive than the other method.

We do not advise layers in building up putting-greens. It has been our experience that the porous layers of cinders, gravel, etc., have done more harm than good. In order to grow good grass it appears to be necessary to have a definite connection between the surface soil and the subsoil. Plenty of vegetable matter, and sand, if the soil is inclined to be heavy, will usually give the porous condition that allows for ample drainage.

9. Sulfate of ammonia, frequency, method and rate of application.—Our greens are not yet quite two years old and are doing only just fairly well. How often may we apply sulfate of ammonia to our putting greens at the rate of about 5 pounds to 1,000 square feet of area?—(Indiana.)

We are inclined to think that three or four applications per year at the rate of 5 pounds for each 1,000 square feet are sufficient, and in cases where the soil is regarded as rich, fewer applications will suffice. In our work we regard 5 pounds as about the maximum quantity, and it is probable that 1½ pounds or 2 pounds applied every month during the growing season with a little compost will give better results than 5 pounds applied three or four times during the year. While sulfate of ammonia may be applied very satisfactorily with sand, we are of the opinion that some compost at least should be used in connection with it, especially where this fertilizer is used more or less continuously. We have had excellent results from the use of sulfate of ammonia applied in a dry condition either with sand or compost and allowed to remain without being watered until washed in by the rain or until the greens required artificial watering. We have had some trouble from burning when sulfate of ammonia is applied in hot weather at the maximum rate mentioned above. From numerous reports recently received it is evident that a weak solution of sulfate of ammonia well watered in is a somewhat safer method of application than the dry method even though water be used freely afterward. It is a good plan to experiment to find how much is safe to use. Any ill effects from using too much will be noticeable in twenty-four hours.

10. The value of humus as a fertilizer.—Is humus a fertilizer? We are of the opinion that this has very little value except to mix with the soil to get a proper base.—(Pennsylvania.)

The so-called humus is nothing but bog muck, or peat, taken from swamps. You probably have the same kind of material within hauling distance of your club if you look around for it in the woods or swampy places. It is usually a good material when mixed in a compost pile with stable manure. It should be allowed to compost a year before using. Some of these swampy peats are toxic to plants. The only way to find out about this is to put some in a box and sow seed in it and watch results. Keep it moist and in a warm place, and if it is toxic the plants will soon begin to turn yellow and show a sickly growth,