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 privilige and duty to write to the Green Committee.

1. *What is the best way to destroy dandelions on putting greens? H. B. V.*

Three methods are practicable, as follows: (1) By digging out each individual plant, a plan that has evident disadvantages, as more or less grass is necessarily injured or destroyed. (2) By killing them with sulphuric acid, applying the acid with a sharp, stout, stiff wire rod stuck into the middle of each plant. Acid is a disagreeable substance to handle. If used, the acid should be in a broad-mouthed bottle, such as a pickle bottle, fixed to the middle of a board or tray. In taking the rod from the bottle is should be drawn over the mouth of the bottle to remove excess acid. The tray will prevent drops of the acid from falling on the grass. (3) By killing them with gasoline injected into the crown—a very neat method. The gasoline can be applied by an ordinary oiler with a sharp-pointed tip. A special implement to apply gasoline, costing $1.00, is on the market, and on application the address of the manufacturers will be furnished by the Service Bureau.

To combat dandelions in lawns and on fairways, spraying with a solution on iron sulphate is worthy of trial. The solution consists of one and one-half pounds of iron sulphate, also called copperas or green vitriol, to one gallon of water. As iron sulphate corrodes metals, the solution should be mixed in wooden vessels. It is best to use a spraying outfit mounted on wheels, and which will throw a fine mist-like spray. At the New York Experiment Station nearly all of the dandelions were destroyed by spraying five times, the first spraying just as the plants begin to bloom in May, the second and third sprayings three and six weeks later. In addition two sprayings were given in late summer. Practically all of the dandelions were destroyed, and also white-clover, heal-all, plantain, and buckhorn. The grass is but little injured, but it is desirable to stimulate it into vigorous growth by the use of fine, well-rotted manure, bone meal, or nitrate of soda.

At the Colorado Experiment Station very similar results were secured but the most effective treatment was spraying three times in August and September at intervals of two weeks. No irrigation should be given for 24 to 48 hours after spraying. The grass was injured slightly, but with good treatment soon recovered. White clover was completely killed by the three sprayings.

At Arlington Farm, Virginia, it required five sprayings to kill the dandelions, but this also resulted in much injury to the grass. The bents were much more injured than was bluegrass.

In the light of present evidence, the iron-sulphate spraying method is well worthy of extended trials and is likely to prove much more effective in some localities than in others. Iron sulphate gives a rusty stain to cement walks and walls and therefore care should be taken not to spray or spill the solution on them.

2. *Please report on the sample of muck sent herewith and advise as to its value on golf courses. W. S. F.*

The sample sent is in texture and color a fine sample of muck, but whether or not it contains toxic substances is best determined by sowing bent or fescue seed in a shallow box of the material. If the seedlings grow well the muck is desirable; if not, it can be bettered by mixing in finely ground limestone, 100 to 200 pounds to a ton of muck, and allowing it to weather some months. Sometimes weathering alone will remove the toxicity. As a rule, the surface of muck deposits is much better than the deeper material. Good muck is excellent material to mix in the soil of a new putting green, especially if the soil is very clayey or sandy; large quantities may then be used to advantage. Muck alone is not desirable as a topdressing, as it dries and blows away and its effects are not striking. It may be used with good results in compost heaps, building these of alternate layers: the first, muck mixed with lime; the second, good garden loam or sod; the third, barnyard manure. After being thoroughly composted for at least three months, these layers, mixed and sifted, make excellent topdressing material for putting greens.

3. *Can nitrate of soda be applied as a fertilizer dissolved in a solution of corrosive sublimate to destroy earthworms? W. T.*

There is no chemical change brought about by mixing solutions of these two substances; so there is no theoretical objection to using these two in a mixture. Some of the nitrate will, of course, be washed pretty deeply into the soil by the water used to get the poison to the worms, but the loss of nitrate by this means will not be large. It will be of interest to learn how the scheme works in actual trials.

4. *What are the relative desirabilities of carpet grass and Bermuda grass for fairways in the South? J. R. I.*

Both of these grasses make superb fairways in the South on soils to which one or the other is adapted. Carpet grass is well adapted to soils that have a good moisture supply near the surface. In general, carpet grass is best on sandy soils, especially those that are relatively level and not too dry; but it succeeds well on rolling lands with sandy soil at the surface and a shallow clay subsoil. Even on clay soil carpet grass is often more vigorous than Bermuda grass. Bermuda grass is to be preferred, as a rule, on clay soils and other soils not moist enough for carpet grass. The seeds of both grasses are available on the market, but Bermuda grass is often planted by the vegetative methods.

5. *What grass seed would you advise be sown on putting greens in the South where the course is used only in winter? C. J. B.*

Redtop, by all means. The seed is cheap and of high quality, especially the recleaned grade. It is a waste of money to sow fine bents and fescues, as the seed is expensive, and young redtop turf which results from seeding each fall is fully equal during the winter to turf made by the fine bents. The grass all dies out in the South during the hot summer weather. Many clubs still use rye-grass, either Italian or English; but the redtop is immeasurably superior.

6. *Is there any danger of introducing weeds into putting greens through the application of stable manure or compost? M. T. O.*

There is very little danger if the manure is reasonably well-rotted or the compost has remained in the stack or pile for a few months. Stable manure, leaf mold, peat, and similar organic materials sometimes carry weed seeds; but it is a very easy matter to determine whether or not viable weed seeds are present. Simply put a small quantity of the material in a tray or a box, such as an ordinary cigar box, and keep it moist and warm. This will afford suitable conditions for germinating any live seeds that may be present. If seedlings do not appear at the end of a week or ten days it may be assumed that the material is safe to use as a topdressing. The danger of introducing weeds by the use of humus topdressing has been much over-estimated; nevertheless, precaution should be exercised to avoid the unnecessary introduction of weeds into the greens.

7. *How can I become an expert greenkeeper? O. B. F.*

At the present time there is no educational institution where instruction is given in greenkeeping. We would suggest that you study thoroughly the best books dealing with the subject, and at the same time get your practical experience by working on a first-class golf course. At the end of a year, if you are studious and diligent, you should have a good foundation. One year's experience is not much, as the conditions may have been either exceedingly good or very bad. Until a man has had four or five year's experience under different conditions of soil and climate he can hardly call himself expert. The salaries now paid to efficient greenkeepers amply justify thorough training for the work.

8. *What are the effective substances that worm-killers contain? J. C. S.*

The effective poison is nearly all the worm-killers on the market is corrosive sublimate (bichloride of mercury). This substance makes up but a small part of the commercial worm-killers, most of it being a filler of various kinds. One worm-killer formerly on the market consisted in part of the poisonous pulp made by crushing the seeds of *Bassia latifolia,* and East Indian tree. Another, with a special name and not very efficient, consists largely of sulphur compounds, particularly sodium polysulphide and sodium thiosulphate. Many substances will irritate the worms so that they come to the surface, including lime water and probably all weak alkalies, vinegar and perhaps all weak acids, and kerosene emulsion. Some new substances are now under test which promise to be more efficacious than any of the older ones.

9. *Is this sample of soil from our putting greens sour? If so, what treatment is desirable? W. J. H.*

The best grasses for putting greens—that is, the bents and the fescues—make the finest quality of turf on soils somewhat sour or acid. If the reaction of the soil is changed by adding lime, the result will be a great increase of the various turf weeds, and consequently a poorer quality of turf. For this reason lime should rarely or never be used on putting greens composed of bents or fescues. Naturally acid soils are, in the light of present evidence, the most desirable for fine bent. It is very difficult to change a neutral or alkaline soil into one with acid reaction, various experiments thus far made with this object in view having given unsatisfactory results. Even when sulpheric acid was used, the increased acidity of the soil was very transitory. Sulphate of ammonia has long been known

to bring about an acid condition after long use; but when applied to the turf it must be used cautiously, as it will burn grass severely. Attempts are now being made to secure the desired degree of acidity by adding the ammonium sulphate to the soil before seeding or planting. Nitrate of soda, which is very commonly used, gradually brings about an alkaline condition of the soil—just the reverse of ammonium sulphate. In testing with litmus paper, make a moist ball of the soil, break this in half, put a strip of blue litmus paper on one-half and cover with the other half, pressing them closely; if the soil is acid the paper will turn pink by the end of five minutes. Or put a strip each of blue and pink litmus paper in the bottom of a tumbler and fill it half full of moist soil, pressing it down firmly. The change in color, if any, can then be watched. If the blue litmus turns pink, the soil is acid; if the pink litmus turns blue, the soil is alkaline; if no change takes place, the soil is neutral. If you must test out the effect of lime to satisfy yourself, try applying it just to one-half of a putting green and then watch for any changes you can detect between the two halves.

10. *Is humus good for grass on greens where there is a heavy clay soil? E. M. V. V.*

A good content of humus in the soil is a necessary condition to secure really fine turf. Incidentally it tends to increase the "springiness" so desirable on putting greens. By humus in the broad sense is meant more or less completely decayed vegetable matter. The best form of humus for turf is stable manure, preferably composted and well-rotted. Mushroom soil, if it can be secured, is probably best of all. Humus should be abundantly incorporated in the soil in building a new putting green, and thereafter should be applied several times a year as a topdressing. Peat and muck humus, sold as a commercial article, is to be viewed with suspicion. Frequently it is very toxic, and injures grass greatly, at least temporarily. (See also answer to question 2 above.)

Relative Response of Turf Grasses to Fertilizers

Turf grasses are not all alike in the degree to which they respond to fertilizers. In other words, some make more growth than others when given an application of the common fertilizing materials, such as barnyard manure, bone meal, nitrate of soda, sulphate of ammonia, potash, and acid phosphate. The order of their response is as follows: Kentucky bluegrass, fescues, bents. There is a marked difference between the effect of fertlizers on Kentucky bluegrass and their effect on the fescues and bents; bluegrass not only responds more quickly and markedly but it is affected for a greater length of time than are the other two. However, the turf grasses are essentially alike with regard to the season of the year during which they respond to the application of fertilizers. All respond with a reasonable degree of definiteness in the spring and fall, and all show lack of definite response in the summer.