

set out on low, poorly drained areas, the grass soon succumbs to an excess of water and is replaced by the less desirable taller grasses.

Buffalo grass spreads almost entirely by surface runners, which should not be disturbed by hoeing or cultivating after the sods are set out. It is well to clip at intervals throughout the season to control other growth and admit sunlight essential to the spread of the grass. Clipping will not wholly destroy but will reduce competing growth and leave a stubble over the land sufficient to minimize the roughening effects of erosion and soil blowing. A mowing machine or a high-cut lawn mower, cutting at a height of 2 inches, will cut the taller grasses without unduly injuring the prostrate buffalo grass. Observations indicate that persistent and repeated close clippings of buffalo grass with an ordinary lawn mower weakens the grass and encourages the inroads of weeds.

The uneven surfaces caused by wind and water erosion or careless transplanting may be leveled by topdressing after the grass has become fully established on such areas as lawns, golf courses, or football fields, where a smooth surface is desired. Depressions in the turf may be filled by periodic applications of a fine layer of soil, being careful not to cover the leaves entirely.

QUESTIONS AND ANSWERS

All questions sent to the Green Section 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. If your experience leads you to disagree with any answer here given it is your privilege and duty to write to the Green Section. While most of the answers are of general application, it must be borne in mind that each recommendation is intended specifically for the locality designated at the end of the question.

Use of peat in preparing sandy soil for putting green purposes.—How valuable is peat in preparing a sandy soil in the construction of putting greens? In what amount should it be used on a soil that is almost pure sand? (New Jersey)

ANSWER.—Peat would be very desirable in supplying organic matter in preparing a top soil for your putting greens. For best results about 20 cubic yards of peat would be required for a green of 6,000 square feet. The peat should be disked in and thoroughly mixed with the top 4 inches of soil.

How can we get rid of annual bluegrass? (Ontario)

ANSWER.—It is practically impossible to get rid of annual bluegrass (*Poa annua*) in putting greens, by ordinary methods, once it has been allowed to go to seed in the greens. It will produce seed even when kept closely cut. When it first appears in a green as scattered individual plants it can be removed by hand weeding. If it has developed into more or less solid patches, these may be removed with a hole cutter or a turf plugger. When, however, it is fairly well dispersed through a green it is necessary to remove all the sod and replant the green, weeding out any annual bluegrass afterwards as fast as it appears. Much can be done to prevent the grass from get-

ting into a putting green. In the first place, care must be taken not to use topdressing material which might contain seed of annual bluegrass. A great many golf courses are unconsciously putting annual bluegrass seed on their greens through the medium of topdressing. In order to detect the presence of the seed in topdressing material, a sample of the material may be put in a greenhouse and kept watered until all seed contained germinates and the identity of the plants can be determined. In the second place, care must be taken to protect a green from overwash from surrounding higher areas in which annual bluegrass occurs. This can be done by placing swales or sand traps so as to intercept the overwash.

Steam sterilization of soil under growing turf.—An apparatus has been shown to us for forcing steam below the roots of grass and it is suggested that by its use insects in the soil will be killed and the nitrogen content of the soil increased. Could this apparatus be advantageously used on putting greens? (Ohio)

ANSWER.—Steam sterilization of soil for killing weed seeds before the soil is used for planting crops has been practiced for some time, and you will find the process described in the Bulletin of September, 1930. We doubt, however, that steam could be forced into soil under growing turf without a certain amount of the steam filtering around the roots of the grass and thus killing it. No doubt the steam would kill the insects and worms in the soil and tend to make more nitrogen and other plant food available, but if at the same time it destroyed the turf the results would not be so favorable. We do not know of any work that has been attempted with a view to sterilizing soil underneath turf and are therefore unable to say to what extent the turf might be injured. It might be well to have the machine tried out to ascertain its effect on soil insects and on the turf underneath which the test is made.

Fertilizers for rose bushes.—We have had excellent results in our rose gardens by fertilizing twice a year with a mixture of pulverized cow manure and bone meal. We are told, however, that a certain specially prepared fertilizer should be used on roses, since it contains necessary elements not found in the mixture we have been using. Have you any information on this matter? (New York)

ANSWER.—The United States Department of Agriculture informs us that it has found nothing better for roses than the mixture of pulverized cow manure and bone meal applied to the bushes twice a year.

Reseeding greens.—Within a few weeks we must entirely reseed one of our greens and patches on other greens. In what manner can this best be done? (New York)

ANSWER.—In reseeded a green we would rake the existing turf and cut it as close as possible, and then spike the green, seed, and apply topdressing and fertilizer. If convenient, the seed, topdressing, and fertilizer may be mixed together. The turf should not be spiked too deep, since seed washed to the bottom of holes that are too deep, and then covered with topdressing, might not germinate.

Should putting greens be watered in daytime or at night? (New Jersey)

ANSWER.—We believe that, everything considered, it is best during summer to water putting greens in the early morning. The reason for this is that the fungi which cause common turf diseases depend upon sufficient moisture and heat to make growth on the turf. The surface of a dry putting green would be less humid on hot nights than one that had been sprinkled. For that reason there is less spread of disease on putting greens at night if the surface is dry. In the control of fungus diseases it is advisable to get the dew off the greens as early as possible in the morning so that the grass may dry quickly. It has been found that watering the greens breaks the surface tension of the drops of dew on the grass, so that it dries much more quickly in the morning after it has been watered. Watering has the same effect on greens in this respect as poling and switching. It is true that there will usually be more moisture lost by evaporation from early morning watering than from night watering, due to the influence of the sun; but if the greens are watered thoroughly in the morning sufficient water will be stored in the soil to carry the greens through the following night, as the roots will tend to get in contact with the water which has sunk below the surface. Even though the surface is dry in the evening it will be frequently found damp before morning because there is a gradual rise of water in the soil. It has frequently been proved that, contrary to common superstition, watering putting greens in the sunlight does no harm. Another argument in favor of early morning watering is that greens are usually more economically and thoroughly watered then, since it is easier to keep track of the men engaged in this work in daylight than after dark.

Utilizing local strains of Bermuda grass on tees.—While bluegrass is abundant in our section it is not sufficiently vigorous to withstand the hard usage occurring on our tees, especially those calling for an iron shot. We also have a wild Bermuda grass here, commonly known as wire grass, which, however, seems to be ideal for our tees, as we have tried some out on the tees and with excellent results. It is difficult to find a sufficient quantity of this Bermuda grass for our purposes. We are sending you a specimen of the grass and should be glad to know where we may obtain seed or stolons of it. The grass loses its green color and becomes brown with the first frost, but it leaves a heavy mat during the winter months and becomes green again the following May. (Virginia)

ANSWER.—Bermuda grass varies considerably and consequently there are a great many distinct strains. However these have not been isolated and therefore we cannot identify your sample with any particular strain. You could plant Bermuda seed, but the chances are that this strain which is growing under your conditions is more hardy and better adapted to your section than the majority of plants that would be produced from seed. Bermuda grass grows luxuriantly in nurseries, and it is therefore suggested that you plant a nursery of such patches of the grass as you may find possessing the best appearance. The stolons or the sod produced in this nursery could then be used for planting your tees.



When the interval between intellectual classes and the practical classes is too great, the former will possess no influence, the latter will reap no benefit.

—Henry Thomas Buckle.

