The Modern Construction of Putting Greens In the Middle West and Southern Hot Clay Soil District

By Leonard Macomber

CLAY soils are perhaps the most difficult class of soils to deal with, especially where climatic conditions are severe, and one must always bear in mind that to produce and maintain putting greens of the finest quality, it is necessary to make a marked improvement in the mechanical condition of all heavy soils.

If you have a heavy sticky close grained, compact soil, it must be made more fertile, porous, and warmer. The drainage must be well taken care of and sufficient sand and humus incorporated in the soil to make it porous and firm and supply the necessary plant food.

It is easy to form an opinion of a putting green by just walking over it. One can tell by the feel of the turf whether its firmness is due to over rolling or to the employment of more correct methods.

In many districts, it is impossible to play on putting greens situated on the natural clay soil very early in the Spring, because they remain wet and sticky so long and then with the arrival of the hot dry weather, clay soils have an unfortunate characteristic of caking, packing, and cracking badly.

The soil gets so hard it is impossible to play a "pitch" shot onto the greens and "hold" the ball. One month the greens are soft and "slow" and the next, they are hard and "fast."

So progressive ideas on putting green construction have resorted to elaborate methods to overcome all the difficulties of producing and maintaining first class greens in hot, clay soil districts.

We find one club, the Scioto Country Club, of Columbus, Ohio, spending as much as a thousand dollars in the construction of each of their eighteen putting greens. The system they worked on in general is as follows:

They built large irregular shaped undulating greens, first of all plowing the areas and scooping off all the good top soil into one deposit and then scooping down into the sub-soil to the depth of about twenty-four inches, piling up the poor soil separately—using it as a filler in some cases or for the foundation of mounds.

The general contours of the surfaces of the greens were formed in the subsoil and after laying drain tile in herring bone formation, they placed a six to eight-inch layer of cinders to take care of the drainage effectively. Of course in localities where cinders are not obtainable cheap, any other porous material, such as broken rock, gravel, or loose sand will answer the purpose.

On top of the drainage layer was placed a fifteen-inch composition layer made up of fifty percent soil (using the top-soil removed from the greens if of good quality), about twenty-five percent sharp sand, and about twenty-five percent stable or barn-yard manure; the soil having been previously sweetened with ground limestone.

The materials were all mixed in a cement mixing machine right at each green, and sufficient time allowed for the composition soil to settle before going on with the work.

Then was placed another layer about three or four inches thick—a mixture made up of the best sifted loam obtainable—representing about fifty percent. —thirty to forty percent. of sharp sand, and ten to twenty percent. of well rotted stable manure. This material was made lighter with less manure, and in the preparation of the seed bed, a complete artificial fertilizer was used and the seed covered with a quarter-inch layer of pure humus.

With the surface drainage properly taken care of, there was no difficulty in producing and maintaining an excellent turf on the greens. At the same time, it is necessary to weed, renovate, reseed, topdress, and sand the greens systematically and occasionally sweeten the soil with pulverized charcoal.

During severe hot dry weather, the greens are "dusted" with sifted compost and watered freely two or three times a week, and if the turf is kept healthy, thick, and strong,—there is not much room for weeds, and the annual crab grass.

The advantages of building greens as above are many. They play better; worms are less in evidence; the greens are open for play much earlier and later in the season; they behave properly in bad weather—that is, they drain freely in wet periods; the surfaces keep in good condition; and in dry hot weather, the soil does not bake, pack down hard, and crack. As the make-up and up-keep of the greens are artificial, it is not necessary or desirable to choose grasses that are natural to, or thrive best, in a certain district under natural conditions, but rather to choose those that are best suited for putting greens.

The nature of the soil in many districts is generally responsible for the failures to produce and maintain really good greens. If the soil conditions can be improved and changed, there is no reason at all, with artificial systematic treatment, why good greens cannot be produced and maintained. In some of the Southern States, for instance, on heavy clay soil in North Carolina and Georgia, putting greens are being constructed on more or less the above system and during June, July, and August, it is proposed to cover the greens with cheese cloth (about three to four feet above the ground) as a protection from the hot sun — and play temporary greens. It is the same arrangement as covering tobacco, but the greens should be watered systematically and uncovered occasionaly to benefit from the natural rains and allowed some early morning or late afternoon sun.

The Use of Lime

By R. Vander Beken

GREENKEEPERS are nowadays fully alive to the importance of maintaining a supply of lime in the soil that it may seem unnecessary to write at length on the subject, but as examples are so often cropping up where otherwise good soils are deficient in lime, it seems an opportune time to point out how to determine whether or not the soil contains a sufficiency of lime.

As is well known, one main use of lime is to neutralize the acidity of the soil, set up by the decomposition of organic matter. For a shortage of lime a good indirect indication can be determined by testing the acidity of the soil.

Methods of testing for acidity with litmus paper.

The usual test for acidity or sourness in a soil is blue litmus paper; if this is turned red, it may be concluded that the soil is sour and that it will greatly benefit by liming or an application of marl or ground limestone.

There are several tests, but three of the simplest are:

(1) Take a handful of soil in a somewhat moist condition, place a slip of blue litmus paper in the soil, which is then kneaded gently for a minute or two so as to bring the particles of the soil in close contact with the litmus paper. If the soil is acid the colour of the litmus paper will change in the course of 5 to 10 minutes to red.

(2) Take a little of the surface soil from, say, half a dozen places on the area to be examined and mix well. Take a few ounces of this mixed soil and, putting it in a clean cup or tumbler, pour on a little boiled water and stir until it becomes a thick paste. Into this insert a piece of blue litmus paper by means of a small stick or the back of a knife. After fifteen minutes carefully draw out the paper and if that part of the litmus paper which has been in contact with the "mud" has turned