

# Soil Characteristics in Relation to Golf Courses

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**T**HE GREENKEEPER is the man who is responsible for the looks of the course. You, Mr. Greenkeeper, come onto the scene after the land is selected. They hand you something and you have to make something out of it. It is up to you to make an attractive course, one which people like to get out onto. You have nothing to say about the type of soil that you have to work with yet it is one thing you are primarily concerned with because this soil is what you are going to grow the trees, shrubs, and grass on, and the general appearance is going to be due to the kind of soil you have to work with.

Soil consists of a mixture of different size particles of rocks along with particles of organic matter. The size of these particles is a very important thing and we have described that under the name of texture. O. J. Noer has given the list of textures—coarse sand or fine gravel, medium sand, fine sand, medium sandy loam, fine sandy loam and very fine sandy loam, silt loam, silty clay loam, clay loam and clay. The following show the textures: Sand (coarse, medium, fine), 10 to 15% silt and clay; loamy sand, 15-20% silt and clay; sandy loam, (medium, fine and very fine), 20 to 50% silt and clay; loam, 50% or more of silt and clay; silt loam, less than 20% clay, and 50% silt; silty clay loam, 20 to 30% clay, 50-80% silt; clay loam, 20 to 30% clay, 20-50% sand; and clay, more than 30% clay, less than 50% silt.

The amount of silt and, especially clay, in soil has marked effect on the water holding capacity. The finer the texture the higher the water holding capacity; the coarser the texture the lower the water holding capacity. You want enough fine material so that you have some considerable reservoir for water for the soil on which you are going to grow your grass. It will have a definite relation to the amount of grass produced and it will have a definite relationship to the amount of water required. Where you have the fairways so that you can use sprinklers it is not so much of a problem.

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*\*One of the papers read at Minnesota Greenkeeping short course.*

Texture of soil is very closely related to natural drainage; the finer the soil texture the poorer the drainage. Also, the finer the texture the more apt the soil is to get hard. You sometimes have this hard surface in places where the texture appears to be very fine. You can see that these things are working against each other.

## Relation to Natural Drainage

In this connection, also consider the matter of nutrients and natural fertility. The finer the texture, ordinarily the more fertility there is in soil. For natural fertility you will want a medium fine soil. Perhaps the ideal soil for your golf courses would come somewhere in between the fine sandy loam or loam. This loam soil is often spoken of as 50-50 soil. It makes nearly an ideal soil because it has water holding capacity, is ordinarily fairly fertile, drains well and hence permits earlier play in the spring.

Organic matter is very desirable in any top-soil, as it serves to prevent baking. Organic matter is a good deal like a sponge or peat. It helps to hold the water in the soil.

## Chemical Properties

Under chemical properties such things as the supply of plant food nutrients, nitrate phosphate, potash and lime should be considered. Consider the reaction as to acidity. This is quite important to you concerned with golf courses. The most suitable reaction for plant growth is slightly acid. A pH around 6.5 is considered ideal. Plants perhaps do a little better under that reaction than under others. We have plants that will naturally grow under acid conditions. Some grasses fall under that group. An acid reaction may effect different types of weed growth. Get your soil acid and dandelion and chickweed will not grow so well. The reaction of the soil may have some relationship to the development of certain fungous diseases.

In the case of nutrients we are chiefly concerned with nitrogen, phosphate and potash, three elements we ordinarily apply in commercial fertilizer. We can supply these as we want. In growing grasses nitrogen is most important because it makes an abundance of top growth. Select your nitrogen fertilizer to suit your needs. There is a nitrogen fertilizer that develops an acid reaction, it is urea. It has a

tendency to cake, so you have to be careful in using it. It is the exact compound you find in manure.

If you want to develop an alkaline reaction, use nitrate of soda. If you don't want to effect the reaction, use organics such as blood, etc. Nitrogen fertilizers can be applied on top, but organic fertilizers are better worked in.

There are several phosphate fertilizers; some are very readily available. All the super-phosphates are in that group. Some less available phosphates are ordinary rock phosphates which I wouldn't advise you to use at all. Bone meal is slowly available. It is widely used. There are also very readily available phosphates, such as ammonium phosphate which go a long way; therefore use them with care. With phosphate fertilizers it is a good plan to work them in. If you are on the spot when they are preparing the greens, work the fertilizer into the soil about three or four inches. If you get it worked in it will have a desirable effect on the root system.

What should you use? You know your conditions. You have your fertilizer plans developed. Do not change until you have done some experimental work on the side. 't would be foolish as you know now what results you are getting but you don't know what you might get, if you change your plans. Apply a good fertilizer (nitrogen, potash and phosphate) on your greens and fairways once a year. If you haven't been including potash, it would be a good plan to put a little potash on. Once a year at least give a complete fertilizer and the rest of the year follow what experience has taught you is good for your course. Carry out a few experiments as you go along.

I am wondering if some of you are not putting on too much fertilizer. It is easy because you take a fertilizer like ammonium phosphate and it has a lot of plant food in a handful. The phosphate isn't going to over-fertilize very much because it becomes fixed in the soil, but nitrogen might have some bad effects in making overgrowth. If you put on an excess of nitrogen you are apt to get a coarse growth. It is the thing that you have to watch the most.

Cleveland, O.—A galvanized metal shower compartment, fully equipped, that sells for \$45 is being made by the Sanymetal Products Co., 1772 Urbana road. The compartment is finished in gray baked enamel. Further details will be sent on request.

## Golf Teaching a Cinch—Only 42 Troubles

**A** RECENT questionnaire sent out by the PGA asked the pros what detail of the game was most difficult for the students to learn. The answers give a pretty clear hunch that golf instruction is no job for a man who isn't competent, as approximately 300 returns gave 42 different problems that the pro tutor has to work out for his pupil.

Most commonly noted difficulty was inability to get some rhythm into the pupil's swing. Although the majority of the pros said women's lessons made up the greater part of their business it was obvious from the returns that the traditional grace of women seems to be frightened away by the sight of a little white ball.

A list of the features the pros noted as "hardest to get the pupil to learn" follows, but not in order of the frequency with which the difficulties appeared in the questionnaire answers:

Balance, holding club correctly, coordination, driving, long irons, pivot, iron play and recovery shots.

Bunker shots, direction, relaxation, approaches—100 yards, short pitch over traps, straight left iron, relaxation at impact.

Weight shift, swing from outside in, holding body still, hitting with hands, timing, downward swing.

Holding head still, mashie, grip, hitting with club instead of body, judgment of distance, stroke is a swing, how to handle club.

Brassie from fairway lie, all irons, concentration, left side of body, shifting of weight.

Follow through, overcoming tenseness, to start downswing properly, body action, rhythm, conscious effort.

Hit through, woods with men, irons with woman, mid-iron, long shot to green.

## Kansas City G. A. Adopts 1932 Caddie Rates

**R**ATES for caddie service in 1932 recently adopted by Kansas City G. A.:

Single, 9 holes	.....\$ .50
Single, 18 holes	..... .75
Double, 9 holes	..... .75
Double, 18 holes	..... 1.30

Practice 40c an hour; minimum time, ½ hour. Additional charge for caddying if boys are taken to other courses, 35c.