

An endowment fund seems the most feasible plan to provide for greater support, and the United States Golf Association has sanctioned the organization of an incorporation to carry out this idea.

The Green Section needs larger support to adequately perform the work of investigation and of research necessary to reach its highest development with which it is confronted. It must be borne in mind that much of the information which it has utilized is that gathered by years of work by the United States Department of Agriculture and state agricultural experiment stations. This fund of information, so far as it relates to golf courses, is now pretty well exhausted. If the Green Section is to be kept up to its present standard, there must be much experimental work performed to solve some of the very perplexing problems which confront greenkeepers. The wide variations of soil and climate in this country give rise to many local problems. It can not be expected that the results of experiments conducted in one locality can be applied generally over the whole United States. There is great need for experimental work similar to that conducted at the Arlington Farm at Washington, to be carried on in several different places. The carrying on of experimental work at several places in the country by the Green Section is important for two reasons: First, because it enables us to determine the influence of different climatic and soil conditions upon turf growing; second, because it will enable us in large measure to unify the investigational work so that experiments in different places will be strictly comparable. Already several agricultural experiment stations are much interested and are anxious to assist in the work. Some of them have ventured to give advice, which we are sure would have been different had it been based on their actual investigations, rather than from old publications. At the present time we are assisting the Florida Experiment Station to conduct some work in cooperation, as there are numerous problems connected with subtropical grasses which can only be solved by tests under the actual conditions. I am sure that the opportunity to enlist the cooperation of trained investigators in our turf problems is one that we must embrace in order to secure the best results. This however will require more funds than the Green Section at present possesses.

It is highly important that the turf investigations all over the country be so organized that the different agencies will not by any mischance work at cross purposes.

Sour Soils.

By LYMAN CARRIER.

Soil chemists are not in entire accord as to what constitutes a sour soil. There are a few simple tests which distinguish acids from alkalis. Litmus paper, which can be obtained from the drug store, is commonly used. Acids turn blue litmus paper red, and alkalis will turn red litmus paper blue. An easy way to make a soil test for acidity, is to put a piece of litmus paper at the bottom of a glass tumbler and fill it with damp soil. The change, if it occurs, will take place in a few minutes and may be viewed through the glass. Soil is a complex material, and the litmus test is not reliable for all chemical conditions which may be encountered.

Many popular notions have developed about sour land. We frequently get in our correspondence the statement "Our soil is sour." After

investigating a number of such instances, we find that several different conditions are designated as sour soils. Any slimy condition of the turf resulting from over-watering, humid weather, or too much manure or indeed any wet land, is likely to be called sour. Of course, the only thing needed to remedy such a condition is drainage; and as "Chauncey" once wrote to "Dear Bill," the next best remedy is more drainage.

The character of the vegetation is frequently taken to indicate whether a soil is sour or not. Such plants as sorrel, sour dock, etc., are often attributed to an acid condition. My faith in this test was once badly shaken. In some pasture experiments I left a pile of quick lime to slack on bluegrass sod. When the lime was removed, the grass underneath was of course entirely killed. But on that spot came up a very luxuriant growth of sheep sorrel.

Moss is another plant which is overrated as an indicator of sour soil. The plats in our fertilizer experiments at the Arlington Farm which have had nothing applied to them but lime have more moss than any others in the series. We might also cite innumerable instances of moss growing on old marble tombstones. Moss comes in turf whenever the grass becomes thin.

Golf quacks spread a great deal of misinformation in regard to this subject. It is an easy thing to say a soil is sour. It sounds scientific. And you may rest assured that the company represented by the quack has something to sell which is a sure-cure for sourness. Spiked rollers, oyster shells, and humus are the stock remedies. The latest cure-all to come to our attention is "agricultural salt." This is used presumably to make the inland courses smell like the seashore. The only other known use for salt on a golf course, outside of the clubhouse, is for a herbicide to kill all vegetation, as along walks and in gutters.

In our opinion real sourness of the soil, so far as growing fine turf is concerned, is an asset rather than a liability. Such grasses as the bents, redtop, and fescues do better on an acid soil than they do on one that is alkaline. We have been unable to note any benefit from lime on bluegrass. Some of the plants which respond favorably to lime, such as crab grass, white clover, and plantains, are serious weed pests on golf courses. We have been trying for several years to convert a neutral or slightly alkaline soil to an acid condition, without much success. It is easy to produce an alkaline condition with lime carbonate and similar materials. But to reverse the procedure and create an acid soil that has any degree of permanency has baffled all the soil chemists to whom we have submitted the problem.

As a rule, old fields which have been cropped for years without any manure being applied are sour. On the other hand, well-manured land is usually sweet or alkaline. Starting with worn-out farm land, it is possible to build up the productivity of the soil with manure and ammonium sulfate without making it unduly alkaline. Under such conditions it is possible to grow fine turf remarkably free from weeds. The old custom of applying lime overcomes this advantage and makes more work for the weeder.

In conclusion it may be well to state that we have never found an instance of a golf course suffering from having a sour soil. This is a bugaboo that the greenkeeper may well forget.