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## THE USE OF SOIL ANALYSES

**I**N recent years various agricultural scientists have given much attention to the testing of soils to determine plant food requirements. For years the Green Section has been using several methods for testing soils in an effort to help clubs select the most effective and economical combinations of fertilizers for their particular needs. There is still much confusion as to what can and cannot be expected from laboratory tests of soil samples.

The Green Section is always glad to test samples of soil from member clubs, report results and offer recommendations based on these tests. To make this service most useful it is necessary for the club official to cooperate fully in sending good representative samples and in furnishing some information concerning them. The taking and shipping of samples is described in this issue.

Laboratory tests of soils serve only as guides. In some cases overzealous individuals have given the impression that all that is necessary is to put a sample of soil through a complicated chemical test and, presto! the whole complicated problem of turf fertilization could be figured out to the nth degree. Agricultural chemists years ago learned that this could not be done with farm crops, and notwithstanding all the showmanship on the part of some soil testers the fact remains that soil tests have in themselves only limited values for turf work.

It is well recognized by those who are best informed in methods of testing soils that the actual results of these tests as an aid in turf culture represent not more than 20 per cent. of the value, whereas the interpretation of these laboratory results represents fully 80 per cent.

A club official will send in a report occasionally of a complete chemical analysis of soil which he has had made by competent chemists.

After going to this great expense this club official has found he is unable to interpret the results and has submitted the report for a Green Section interpretation. In some instances even though the chemical work may have been entirely satisfactory no interpretation can be made of the analysis that could reasonably be expected to justify the expenditure for even the postage stamp used in forwarding the report.

Tests of soil samples with laboratory methods offer a valuable guide in the diagnosis of turf disorders or in determining the amount and kind of materials that should be applied to turf. They should be considered as no more than this.

To understand the value and limitations of soil tests, they may be compared with the taking of temperatures in human ailments or the making of urine analyses. When a physician examines a patient he invariably first takes his temperature. He may find a high fever. This in itself is important but the most important part of the diagnosis is the physician's interpretation of this temper-

ature. It may represent a minor disorder or a serious chronic ailment.

In order to determine what is wrong and be able to suggest remedies the physician makes other tests. He counts the pulse and may have urine, blood and various other tests made. In some cases he can directly locate the source of illness by these tests. In the big majority of cases, however, his diagnosis is based on information he obtains from the patient, or someone well acquainted with his case, as to his various aches or pains, what he has been eating or drinking, when he first noticed any ailment, etc., through a whole series of questions to determine the history of the case and all symptoms relating to it.

The science of turf culture is in its infancy as compared with medical science. Yet there are individuals who register their disappointment when they fail to have their turf problems solved by a soil analysis. We occasionally receive from clubs some samples of soil without even a postal card in reference to them. We often receive samples with letters something to this effect, "We are sending you some samples of our soil. Will you please examine them and let us know what is wrong with the turf?" After examining the soil we may no more be able to diagnose the turf ailment than a physician would be able to diagnose an ailment merely by an examination of urine, blood, temperature, etc., without a collection of other odds and ends of information collected from the patient. Since we cannot obtain this miscellaneous information from the soil samples, it is necessary to ask the club officials furnishing the soil to cooperate in supplying it.

An examination of urine may show albumen in sufficient quantities to quickly guide the physician to a diagnosis of his case. Likewise an examination of soil may reveal grubs or layers of sand, clay or peat which provide definite leads to the disorders. Just as an extremely high blood pressure may give the physician a valuable clue, an excessive acidity of the soil as indicated by soil tests may give a definite clue to turf disturbances. However, in both the cases of blood pressure and soil acidity there is a wide range of tolerance that, except in extreme cases, makes these tests unreliable unless correlated with other symptoms. In the large majority of cases the physician finds that the test he has at his disposal does not in itself definitely locate the disturbance. The same applies to the diagnosis of turf ailments.

When soil tests are used merely as a guide to the solution of turf problems they serve a useful purpose. When overemphasized they can lead to waste and confusion. When recommendations based simply on soil analyses are sent out from any laboratory (regardless of its supposed rating) which assume to describe definite turf feeding or management procedure with hair-splitting differences for the various fairways and putting greens, they should be regarded with suspicion. Quackery is by no means a stranger in the field of turf culture.

## COLLECTING AND SHIPPING SOIL SAMPLES

**A** GOOD sample of soil for analysis represents the area in question. The ideal sample from an area of 1,000 square feet of turf should consist of five or more

small plugs removed at random. In established turf the surface soil to a depth of 1 or 2 inches is of most importance for an analysis of a chemical nature, such