

# Better Harvests from Soil Tests

by **Hadley Reed**

From *Farm Quarterly*  
Courtesy of USIS

Farmers in the United States, particularly those in the midwestern agricultural State of Illinois, are receiving more practical help and are getting better harvests every year as a result of scientific soil tests carried out by soil specialists. Since the Illinois system of soil testing is one of the oldest and best in the United States, a description of how it functions will illustrate how the procedure can be of help to farmers everywhere.

The State of Illinois now has soil-testing laboratories, owned and financed by the farmers they serve, in more than four-fifths of its counties. Most of the remaining counties are served by the existing laboratories. The first country laboratory was established in 1944. Before that time, soil scientists of the College of Agriculture of the University of Illinois had conducted extensive soil-testing experiments and had amassed information for the use of farmers for many years. Since 1944, some 4,000,000 acres of Illinois farm land have been tested to determine needs for limestone, phosphate, and potash.

In addition, the University's laboratory, which guides the soil-testing program, has tested an additional 500,000 acres.

These tests have resulted in a well-rounded program which is recommended to farmers interested in increasing the productivity of their land. This "Illinois System of Permanent Soil Fertility" emphasizes five steps, the first of which is the actual testing of all fields to determine their needs for lime, phosphate, and potash. There has not yet been developed a soil test for nitrogen which can be interpreted practically.

The second step, naturally, is the application of the minerals needed in the amounts indicated by results of the test. A third step is the growing of clover, alfalfa, or other legumes and legume-grass combinations on each field regularly to supply nitrogen and organic matter and to help control erosion. Returning to the land the fertility contained in manure, straw, cornstalks, and other crop rubbish to supply organic matter and to conserve plant food is the fourth step. The fifth step is erosion control on

sloping land by crop rotation, contour plowing, terracing, strip cropping, and other practices designed to hold the fertility of the soil.

In essence the Illinois program is designed to increase and maintain the fertility of the whole top soil. It is successful because it has been developed by practical research men working directly with the farmer. Thus, the program is one which the farmer can use and of which he can readily determine the value to his own land.

"No one person can take credit for the system in Illinois," says Dr. W. L. Burlington of the University of Illinois. "Certainly the foundation was laid down by Cyril G. Hopkins at the beginning of the century. In those years Hopkins traveled all over the State of Illinois urging farmers to apply limestone and rock phosphate to their depleted soils. Since Hopkins' time we have emphasized the need for feeding the soil and letting the soil feed the crop."

The experience of Merlin Shike, a young farmer who had his soil tested in 1946, shows how the soil fertility program functions. Mr. Shike had been getting yields below what he thought he should from his fields. After the soil test was made and he had begun to put into use the program recommended for his farm, his yields increased, some more than 100 percent.

The first step in the test is for the farmer or a representative of the soil-testing laboratory to take samples of the earth. These samples are col-

lected from various spots so that all areas of a field will be represented. The ground is scraped clean of surface litter and several bits of earth are collected and mixed thoroughly. Usually 11 samples are taken for a 40-acre farm. Mr. Shike owns 167 acres, so 45 samples were taken from his farm.

The samples of earth are tested by experienced and qualified soil technicians, and the results of the tests are checked. Then maps of the farm are prepared. Mr. Shike received three maps, each showing needs of his land for one of the fertilizing minerals. In accordance with the showings of his maps as to the amounts of each fertilizer needed he rearranged his farm into eight fields and established an eight-year rotation plan. Under the rotation plan some of his fields are being planted to legumes each year and he has scheduled the application of limestone, rock phosphate, and potash to the areas needing them so that the best results consistent with his needs can be obtained. In general, the application of limestone or rock phosphate provides the soil with material which it will use for a period of 10 years. In making recommendations for the use of fertilizer the soil scientist, of course, takes into consideration recent applications which may have been made.

Cost of making soil tests is moderate particularly in the county laboratories owned by the farmers themselves. Usually this cost is more than offset by the first year's in-

creased yield when the recommendations of the soil tester and the county extension agent or farm advisor are followed. Cost of the fertilizers is, of course, greater, but increased yields soon offset this cost also.

The Illinois program has been outstandingly successful. While much of the informational material collected by the University of Illinois would not be applicable to soils in other latitudes and countries, nevertheless the work done there can be used as a guide by agriculturists anywhere. The first necessity for a successful soil-testing program is the collection of information about soil types and histories in the area where such a program is to be started. Then test-

ing facilities must be installed. Some of the tests are quite simple, but all need to be supervised by thoroughly competent and trained technicians who can turn the results of their testing into practical plans for soil improvement.

The increasing use of soil-testing practices by farmers interested both in improving their crops and in maintaining the fertility of their farm lands is evidence that the tests, when followed by constructive action, are of great value. Pioneers of soil testing look forward to a day when every farmer, no matter where his land may be; will be able to have such service.



### SONG OF THE STUBBORN

Christmas is a stable  
 For shepherds and their kin;  
 We're wise and rich and cultured—  
 We won't go in.

Christmas is a Saviour  
 Fair of face and limb,  
 Whose end will be a gibbet—  
 We don't need Him.

Christmas is a doorway  
 For all who, bending low,  
 Would find the happy kingdom—  
 Heaven?—We won't go.

L. F. Hyland