

INTERPRETING POTATO FERTILITY NEEDS FROM SOIL TESTS

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The ultimate goal of scientific agriculture is to be able to apply results of research to each individual farm. As science progresses, this application can be more and more specific.

In the past, fertilizer recommendations have been based entirely on results of experiments conducted at the nearest experiment station, or on nearby farmers' fields. This is still true to a certain degree. These, of necessity, have been general recommendations and do not take into account the variability among farms, among fields within a farm, or among locations within a field. Experiments cannot be conducted in every field or on every farm. Therefore, in order for soil science to continue to be of service to agriculture, it has been important to apply research findings to each situation. This is true not only in making fertilizer recommendations, but also in diagnosing problems.

There are two tools which have received steadily increasing attention in this regard. They are soil testing and tissue analysis. Of these two, soil testing has come into much wider usage, particularly in Central Washington.

Soil can be analyzed for nutrient elements in the laboratory by any qualified chemist; however, data obtained from a laboratory have no meaning unless there is a "standard" by which to measure. In the case of soil testing, the standard values are obtained by correlation of soil tests with response to fertilizers in the field. This is accomplished by taking soil tests, applying varying rates of fertilizer, and measuring yield, all from the same location. The correlation should be based on a large number of locations.

During the past nine years fertilizer trials on beans, potatoes, corn, and peas have been conducted at 43 different locations in the Outlying Testing Program. In addition, a substantial number of research trials have been conducted. Each of these was used for correlating the soil test with yield response. This has yielded valuable information, particularly with regard to validating the standard values used for the soil test for phosphorus.

The Outlying Testing Program is now involved in a fertility program on alfalfa. In this program, a modification in procedure is being proposed which may also be applicable to potatoes. There will be fewer detailed alfalfa fertilizer trials than there have been on other crops. At the same time, a relatively large number of locations will be used for very simple trials involving two or three fertilizer treatments in

narrow strips across the field. Prior to applying the fertilizer, a soil sample will be taken from each strip. Yield measurements will be taken using the farmer's equipment. The data from all locations will be assembled and subjected to a statistical test.

This type of information is needed not only to confirm the phosphorus test for potatoes, but also for potassium, boron, and other elements for all crops in central Washington. It is expected that the results will have value which is predictive and diagnostic -- for predicting yield responses and for diagnosing soils problems. In addition to the correlative information from all the locations, each trial will have value for demonstration purposes for the farmer involved and for his neighbors.
