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USE OF PLANT ANALYSIS

William O. Thom

Plant analysis is the laboratory determination of several nutrient elements on a single sample of plant material. In recent years this technique has been more frequently used to diagnose soil fertility problems or to monitor soil fertility recommendations on growing crops. Current instrumentation makes it possible to rapidly determine several elements on an extract from a plant sample.

While plant tissue analysis may be used to check for a suspected nutrient deficiency problem or to monitor the status of nutrient elements in a crop, it is not a substitute for soil testing. It is most effective when used with a regular soil testing program. A plant tissue analysis should be regarded as another tool in crop production rather than just getting a few numbers from the laboratory.

The number of elements which are measured depends on the laboratory to which the samples are sent for analysis. Most laboratories analyze for at least 11 elements, and some do as many as 16. The most common elements analyzed in the sample are nitrogen, phosphorus, potassium, calcium, magnesium, iron, manganese, boron, copper, zinc, and aluminum. Others that may be available include, sulfur, sodium, molybdenum, cobalt, and silicon. Although all of these are not essential for plant growth, they are used for interpretation and recommendations.

Interpretation of the elemental content indicates whether each element is insufficient, sufficient, high, or in excess of that required for a specific crop. Stage of growth and portion of the plant sampled will greatly influence elemental concentrations. Tissue sampling of plant leaves becomes quite unreliable after the fruiting stage is started. Because of these differences, research studies have been conducted to determine the best time of sampling, and what part of a plant should be sampled in order to accurately interpret the results. Interpretations and recommendations are available for field crops, vegetable crops, small fruits, tree fruits, and ornamentals.

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In general, the best recommended time to sample agronomic crops for plant analysis occurs near the end of the vegetative growth stage, and just prior to the beginning of the reproductive stage. However, sampling earlier or later may be necessary for specific crops, or when problems are apparent with a crop. Most laboratories providing the plant analysis service will provide a "sampling kit" which contains a detailed instruction sheet on when and how to sample a specific crop. Such instructions should be rigidly followed. Any laboratory which is trying to do a good job will insist on a correctly taken and well cared for sample, a completely filled out information sheet, and a soil sample taken at the same time as the plant sample.

The cost of plant analysis will vary from as little as \$8.00 per sample to about \$22.00, depending on the number of elements and whether recommendations are included. Information on plant analysis can be obtained from your local county agricultural agent. In some areas local fertilizer dealers also make this service available to customers.

Results from plant analysis may not solve every fertility problem encountered. And often, a corrective treatment may not be possible until the next growing season even if a nutrient problem is uncovered. In some cases, results may indicate that a problem does not exist even when abnormal growth patterns are evident. Then the cause needs to be sought elsewhere. Such a result can be a valuable tool in crop management and should not be underestimated.

For the farmer looking for high yields, a plant analysis can play a meaningful role. Comparing plant analysis results from year to year on his crops, and watching for large changes or trends can warn of a developing excess or deficiency. Use of visual observations, knowledge of the field, soil test results, and plant analysis will allow a farmer to seek technical help in adjusting his fertility management program to prevent deficiencies or excesses from occurring.

Sampling Time for Selected Crops

<u>Crop</u>	<u>Time</u>	<u>Method of Sampling</u>
Corn	At silk when silks are still green	Gather the entire ear leaf, removing at the stalk.
Soybeans	Prior to or at initial bloom	Collect trifoliolate leaves, with one trifoliolate per plant.
Tobacco	Prior to or at bloom	Take the entire 4th leaf from the top of the plant.
Forages, Grasses	For maximum quality hay	Remove leaves on the top 6 inches of plant