

### **Practical Uses of Plant Tissue Testing**

Sampling and testing tissue from an actively growing plant during the growing season can be a valuable tool for agricultural producers. The primary reason to utilize plant tissue testing is to determine the concentration of essential elements that are currently present in the plant. Results will indicate whether soil nutrient levels and applied fertilizers are sufficient to meet crop requirements. [Submission forms](#) and additional information regarding plant tissue testing can be found on our website.

For most agronomic crops, there are published values or “sufficiency ranges” for each essential nutrient that indicate normal concentrations for each nutrient, for a specific plant part, at a specific growth stage. Comparing your plant tissue results to these published values can help focus where nutrient deficiency may be occurring. Keep in mind this is a snapshot of one point in time, and conditions can change from day to day.

Generally, nutrient deficiency causes a reduction in plant growth. If the deficiency worsens, visible symptoms appear on the plant and yield can be further reduced. A plant tissue test may aid in identifying these deficiency symptoms prior to yield reductions occurring. In some cases where a plant tissue analysis indicates a potential nutrient deficiency, applying nutrients in-season can address the issue and correct it. For example: a corn field that is young enough to still have a spray application that could include the addition of micro nutrients if the tissue analysis shows a need. In other cases, a nutrient deficiency correction may not be able to occur in-season. This may happen if the plant tissue test is done on a taller plant, where getting into the field for an additional spray application would not be possible. In this case, the fertility program on that field can be evaluated and adjusted for the following growing season.

Plant tissue testing can also be used to compare nutrient concentrations in different areas within a field. For example, if the corn crop looks quite healthy in one area of the field and looks less healthy or different in another area of that field, plant tissue analysis may help the grower identify the reason(s) for this observed difference. Lack of plant health can be caused by nutrient deficiencies in the soil, plant disease, pest damage, soil compaction, flooding and other factors. A plant tissue test can be a valuable tool when diagnosing these problems.

### **Proper Sample Collection and Handling**

[Proper collection](#) of plant tissue samples is the most critical step in using plant analysis as a tool to evaluate an actively growing crop. Plant nutrient composition varies with growth stage, portion of the plant which is sampled, fertility management within a field, soil characteristics, and field conditions. Sample handling between the time of collection and when it arrives at the laboratory is also crucial.



### When to Collect Plant Tissue Samples

The growth stage at which a plant tissue sample is collected will have important implications on how the resulting data can be interpreted. The standard nutrient sufficiency ranges that have been developed, and are used to interpret plant nutrient concentration data, were done at specific crop growth stages. A sample that is collected at a time other than those with available sufficiency data can still be analyzed, however, interpretation of the data may become more complicated. A few examples are included in this table. For a more detailed table of crops and collection times, please use the guidelines proposed by the University of Wisconsin.

Crop	Stage of Growth	Plant Part	# plants to sample
<b>Alfalfa</b>	bud to first flower	top 6 inches	35
<b>Corn</b>	pre-tassel	leaf below whorl	15
<b>Corn</b>	tassel to silk	ear leaf	15
<b>Soybean</b>	prior to or at initial flower	newest fully developed leaf	25

### Including a Soil Sample

Including a soil sample with plant tissue samples can provide a more comprehensive understanding of how to interpret results from the plant tissue analysis. If a plant tissue analysis confirms a possible nutrient deficiency, a soil test can help identify why this deficiency may be occurring. For example, if a potassium deficiency was confirmed with a plant tissue analysis, the level of available potassium in the soil sample may be used to determine if soil potassium supply is lacking; suggesting that the potassium deficiency in the crop may be corrected with potassium fertilization.

A soil sample consisting of at least 10 cores should be taken from the same area where the plant tissue sample was collected. Name the soil sample the same as the tissue sample so results can be easily organized and compared. Try to avoid any fertilizer bands when collecting these samples.