

## Plant Tissue Testing - A Valuable Tool

Plant analysis can be an important tool in diagnosing crop growth problems. Comparing a plant's nutrient level with typical values for that growth stage can aid in determining whether a problem is caused by a nutrient deficiency or by another limiting factor.

Plant analyses, coupled with soil tests, can be powerful tools in determining the cause of growth limitations. By comparing the analytical results from both "good" and "bad" areas in a field, one can better determine the cause of the problem. Plant analysis can identify nutrient uptake problems related to soil fertility or other factors such as soil compaction, fertilizer salt injury, or poor plant development caused by pesticide injury.

### Quartering Procedures

Collecting samples correctly reduces variability and will give a true representation of the plants in the field.

If the sample size is too large, cut plant parts into smaller sections. Mix thoroughly in a clean plastic bucket. Pour the sample out onto a clean sheet of paper and divide the pile into quarters. Keep two opposite quarters and discard the remaining portion.

- Dirty or dusty samples should be lightly rinsed to remove soil particles from the tissue surface. Do not over-rinse: soluble nutrients can be leached out.
- Ship loosely packed samples in paper bags rather than plastic bags to prevent sample deterioration due to heating.
- Contact one of the Servi-Tech Laboratories for further information on collecting tissue samples.

Tissue Sampling Guidelines for Plant Analysis				
Crop	Diagnostic Analysis			Monitoring Analysis
	Stage of Growth	Plant Part to Sample	# of Plants to Sample	
Alfalfa	Prior or at 1/10 bloom	Top 6" of plant	30 to 40	
Corn	1. Emergence to 4 leaf stage	Whole plant	20 to 25	
	2. Six leaf to 10 leaf stage	Youngest mature leaves	15 to 20	
	3. Tasseling to silking	Leaf at or below the ear		

Cotton	Prior to or at first bloom (1st square)	Youngest mature leaves (discard petiole)	25 to 35	Petiole of youngest mature leaves
Grasses: Hay or Pasture	Early Growth	Whole plant	30 to 50	
Potato	Prior to or during early bloom	Leaf of topmost mature leaf	20 to 30	Petiole of topmost fully developed leaflets
Tomato	1. Prior to or during early bloom	1. Compound leaves adjacent to top inflorescence	15 to 20	1. Compound leaves adjacent to top inflorescence
	2. Flowering	2. Opposite or below top flower cluster	15 to 20	2. Opposite or below top flower cluster
Small Grains	1. Seedling stage (less than 12")	Whole plant or tillers	30 to 40	
	2. Prior or at heading	Whole plant or tillers	25 to 35	
Sorghums and Sudans	1. Emergence to 12" tall	Whole plant	20 to 30	
	2. Over 12" tall	Youngest mature leaves	15 to 20	
Soybeans or Other Beans	1. Seedling stage (less than 12")	Whole plant	30 to 40	
	2. Prior to or during initial flowering	Youngest fully expanded leaves (discard petiole)	25 to 35	
Sugarbeets	Mid-season	Leaf of youngest fully mature leaf	20 to 30	Petiole of youngest fully expanded leaf
Sunflowers	1. Emergence to 4 true leaf stage	Whole plant	25 to 35	
	2. Prior to seed-fill	Youngest mature leaf	20 to 30	
Grapes	Full bloom	Leaves opposite bunch cluster	80 to 100	Petiole opposite basla flower cluster
Fruit Trees	Mid-season	Leaf from mid shoot of current year's growth	60 to 80	
Vegetable & Ornamentals	Mid-season	Youngest mature leaf	25 to 30	

## **Shipping Tissue Samples**

After sampling, the plant tissue should be air dried or placed in a paper bag so it will not mold or decompose in shipping. **DO NOT USE PLASTIC BAGS AS SHIPPING CONTAINERS FOR PLANT SAMPLES.**

Avoid shipping tissue samples with other types of samples (soil, fertilizer, feed, water, etc.) to minimize the possibility of contamination.

## **Information About The Sample**

Optimum nutrient levels vary between crops as well as between growth stages of the same crop. Different plant parts also vary in nutrient concentrations. It is extremely important to sample correctly and to include as much information about the plant and field as possible (growth stage, field history, weather conditions, etc.)

Following these guidelines will help ensure accurate diagnosis of nutrient deficiencies. A complete plant tissue analysis from Servi-Tech laboratories includes:

Nitrogen	Magnesium	Iron
Phosphorus	Sulfur	Manganese
Potassium	Sodium	Copper
Calcium	Zinc	Boron

and a bar graph showing the relative plant nutrient concentration, if the proper growth stage and plant part information is provided.

## **Guides To Better Plant Analysis**

Collecting an appropriate, representative plant sample is essential for accurate lab analysis. Use the chart below to indicate the correct plant part to sample at different growth stages for various crops. Proper lab analysis requires an adequate amount of sample.

Proper handling of plant samples is necessary. When collecting plant tissue in the field be sure to use a clean container. **NEVER USE A METAL CONTAINER** to gather the sample, metal containers can contaminate the sample.

If the plant sample is coated with dirt or dust, the samples should be lightly rinsed under running water to remove soil particles from the tissue surface. Keep contact with water to a minimum, since nutrients like nitrate and potassium can be leached from the tissue.