



USE OF TISSUE ANALYSIS IN VITICULTURE

FACT SHEET

Tissue analysis in vineyard nutrition is an excellent management tool and supports a good soil analysis program.

The method of sampling is dependent on the objective: (A) survey of nutrient status, (B) follow-up nutrient sampling, and (C) diagnosing visual symptoms and disorders.

A. Survey of Nutrient Status

This approach is used when surveying a vineyard for general nutrient status and evaluating fertilizer needs or practices. Most of the data available is based on leaf blade or leaf petioles sampled at various stages of growth. The petioles are taken from opposite flower clusters near the base of the shoot. This provides a clean, easily sampled, repeatable tissue which tends to accumulate nutrients more than other plant parts. The samples should be taken during bloom, the nearer to full bloom the better ("full bloom" is when approximately two-thirds of the caps have loosened or fallen from the flowers). The full bloom sample assures that the tissue will be at the same physiological stage regardless of the district and seasonal differences.

Samples should be taken from a single block or management unit and should represent a single variety and rootstock. Areas of distinctly different soil vine appearance, or other condition should be sampled separately. Each sample should consist of 60-80 petioles collected from representative vines uniformly distributed over the area. Sample from non-shaded, normally growing shoots on both sides of the vine canopy.

Growers who routinely sample vineyard blocks from year to year may wish to designate specific rows in a representative area. Resampling the same rows each time improves consistency in the results when tracking the vineyard's nutrient status and adjusting fertilizer practice over years.

Foliage contamination from a nutrient spray will give erroneous laboratory results. Do not sample after a nutrient spray unless you: 1) are not analyzing for any nutrient element contained in the spray, 2) thoroughly wash the samples or 3) are sampling uncontaminated tissue later in the season.

A & L CANADA
LABORATORIES, INC.

2136 Jetstream Rd.
London, ON N5V 3P5

Phone: 519-457-2575
Fax: 519-457-2664
Aginfo@alcanada.com
www.alcanada.com

Fact Sheet No. 362
Revised 11/2013

B. Follow-up Nutrient Sampling

Certain nutrients, which are in the questionable range at bloom, can be re-checked later in the season to determine if deficiency has developed. This is particularly useful with K, which declines in the vegetative parts and can become deficient during fruit ripening. Sampling is best performed at berry softening, beginning of ripening, as it represents another physiological stage with supportive data and when leaf tissue is still healthy and functioning. Select petioles from recently matured leaves. This would be the second fully expanded leaf, usually the 6th to 7th leaf from the tip, on an actively growing shoot. The sample leaves should have the colour and texture of the mature leaves rather than the lighter and shinier, tender appearance of young, expanding leaves.

The smaller petioles at this time may require a higher number in the sample as compared to bloom. Take 75 - 100 petioles per sample if more than one determination is needed. For blade samples, 25 - 35 are sufficient due to their greater mass as compared to petioles.

C. Diagnosing Visual Symptoms and Disorders

Visual deficiency or toxicity symptoms more commonly appear during mid-summer to harvest time. Thus, sampling at this time is useful in diagnosing vine disorders or verifying a deficiency or toxicity. For such situations, sample the affected leaves regardless of location on the shoot and at any time when abnormal appearance is noted. When there are no reasonable clues take both the petioles and blades but analyze them separately.

It is also a good practice to take a sample of "non-symptom" tissue for comparison when the cause is in question. The "non-symptom" sample can be taken from an area adjoining the "symptom" area while making sure that the comparative samples are taken from the same position on the vine.

HANDLING THE SAMPLES

Place each sample in a well-labeled, clean paper bag and deliver to the laboratory as soon as possible. If there is a delay, keep the bags open in a dry well-ventilated place. This will begin the drying process and prevent molding. Never use plastic bags.

Petioles need not be washed unless they were collected from an unusually dusty vineyard or have residue remaining from a nutrient spray. Leaf blades have a greater surface area for collecting dust and should be washed if they are noticeably dirty. They should be washed in water containing a small amount of detergent followed by rinsing in tap water and two distilled water rinses. Remember, however, that some elements (particularly K, NA, and Cl) are easily leached from necrotic or dead tissue. Washing should therefore be accomplished quickly, and excess water blotted from the leaves.

For shipment to the lab over-night courier is the best.