

Grape Tissue Sampling

Sampling Notes

Grapevine tissue analysis is a reliable means to routinely monitor nutrient uptake and identify nutrient deficiencies before they are visually observable, which can prevent a reduction in yield and/or quality. To compare results year to year it is best to sample the same plant part at the same growth stage each year. Petioles (the stem connecting the leaf to the cane) are the plant part most commonly analyzed in California.

General Sampling Instructions

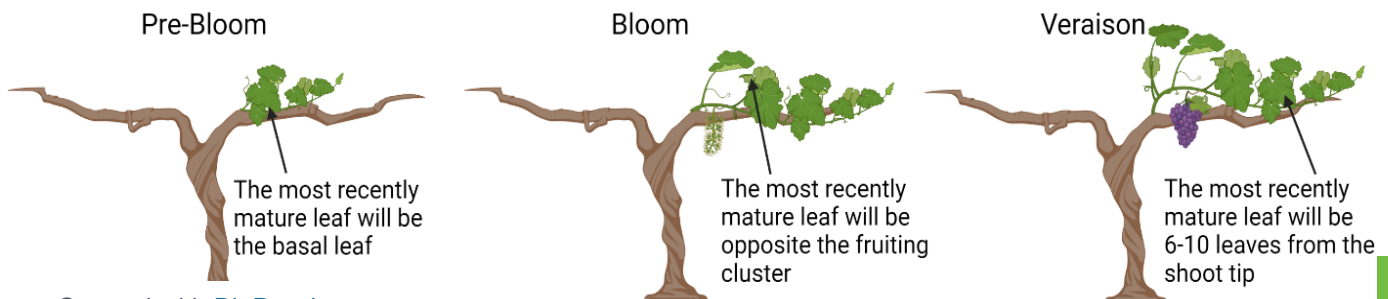
Sampling Time:

- *Pre-Bloom* is generally the earliest you can sample once there is at least 18 inches of shoot growth. At this time, the basal leaves across from the flower clusters have fully matured and have finished accumulating nutrients. Sampling during this time is especially useful when historical information is not available, or the vines have never been sampled before.
- *Grape bloom* is the most common time to sample vineyards. Full bloom is when about 2/3 of the caps are loose or have fallen off the flowers. Tissue analysis at bloom can help guide fertilization for the remainder of the season.
- *Veraison*, the onset of fruit ripening, provides another opportunity to collect samples to follow up on the bloom-time analyses, particularly if measures were taken to correct nutritional deficiencies. It is generally too late to utilize the results from veraison to correct nutritional deficiencies in the current growing season, however results can be used to plan post-harvest fertilization and early season fertilization for the following year.
- *Other growth stages:* Although the most comprehensive interpretive data exists for both bloom and veraison, samples can be collected at any time prior to senescence, especially to compare strong and weaker areas of a vineyard.

Plant Part: Regardless of the stage of growth, collect the petiole or leaf blade of the most recently matured leaf (full-size and dark green). The petiole is preferred over the leaf blade for routine monitoring as most research in California has focused on petiole analysis for sufficiency guidelines.

- *Pre-Bloom and bloom:* The most recently fully mature petiole or leaf blade that you will collect will be opposite a fruiting cluster.
- *Veraison:* The most recently matured petiole/leaf blade that you will collect will typically be 6-10 leaves from the shoot tip, or about 1/3 the total length of the cane from the shoot tip.

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Quantity per Sample: A minimum of 60-80 petioles or 30-40 leaf blades are required per sample.

Sampling Frequency: Samples should be collected at least once a season, although having multiple data points for both bloom and veraison is ideal.

Sampling Area: Collect a separate sample for each vineyard or block that differs in vine age, productivity, rootstock, variety or soil type. Avoid sick/nutritionally deficient vines or sample them separately and compare them to areas of stronger growth to determine what nutrients are lacking.

Sample Collection: For most nutritional deficiencies, petiole sampling is preferred. However, if you suspect boron toxicity, leaf blade analysis is needed. When diagnosing unusual symptoms, you can collect: 1) healthy petioles 2) healthy leaf blades 3) weak petioles and 4) weak leaf blades and submit them in that order on the work request form. It is important that the leaf blades are separated from the petioles at the time of sampling.

Although randomly collecting samples from throughout the vineyard can provide a good overview of the nutritional status of a vineyard, collecting samples from designated sampling rows can reduce the spatial variability and provide more consistent results for year-to-year comparisons. Always collect samples in paper bags, never plastic. When samples are submitted in a timely manner to the laboratory they can be rinsed prior to analysis. Dry samples cannot be rinsed of dust or foliar fertilizer residues.

Recommended Tests:

- *Petiole:* Where chloride is not a problem, the recommended analysis is “G2+TN.” If chloride is a concern, the recommended analysis is “G3+TN”.
- *Leaf:* Where chloride is not a problem, the recommended analysis is “L2” (full nutrient analysis). If chloride is a concern, the recommended analysis is “L3” (full nutrient analysis + chloride).

Preparing Sample for Lab: Take any notes about the sampling block. Once collected, try to keep the samples cool and ship or deliver to the laboratory as soon as possible with a [work order form](#).

References

Christensen, P. (2000). Use of Tissue Analysis in Viticulture. Retrieved from NG10-00 website: <http://cecentralsierra.ucanr.org/files/89528.pdf>

Lazicki, P., & Geisseler, D. (2016). Plant Tissue Sampling in Orchards and Vineyards. *University of California, Davis*. Retrieved from https://apps1.cdfa.ca.gov/FertilizerResearch/docs/Orchard_Tissue_Sampling.pdf

Williams, L. E. (2012). *Review of Mineral Nutrition of Grapevines and Fertilization for California Vineyards*. 115, 1–16.