



The importance of grapevine nutrient status

Knowing the nutrient status of grapevines allows us to identify potential imbalances, therefore allowing an opportunity to improve plant and health. Vine nutrition is important for grape production and vine development throughout the growing season, as the minerals will be used in many important roles during vegetative and reproductive growth. A tissue analysis allows us to evaluate if uptake of nutrients by the plants has been adequate, additionally identifies how nutrient deficiencies can affect the normal development of the vine. These results make it possible to implement a suitable fertilization strategy, which can aid in achieving our goals of yield and quality while maintaining respect for the environment.

It is important to remember, high levels of water and fertilizers do not necessarily result in beneficial response to the fruit and the plant. Tissue sampling is an inexpensive method to determine what is needed by the grapevines.

How is nutrient status evaluated?

Nutrient evaluation of vineyards can be done a number of ways: soil analysis, sap analysis and tissue (or leaf) analysis. To get the full value of doing nutrient analysis, several methods may be needed in combination. Leaf analysis is a very useful tool to quantify nutrient status in the plant, it is recommended that it be done at least once per year. To be able to obtain the most accurate results, it is important to know the growth stage and the position of the leaf on the plant. This is neces-

sary to standardize the sampling strategy as there are fluctuations in the nutrient levels within the plant.

Sampling protocol

How to proceed with tissue sampling will depend on three variables:

When to sample?

Two growth stages are the most used: blooming and veraison. If logistics make it impossible to take samples at both times, sampling at veraison should not be skipped.

Which tissue?

The leaf is the most commonly used part: blade and petiole (see Fig. 1). It is necessary to analyse both leaf parts separately, because depending on the goal or for some elements, one part can be more accurate than the other. It is necessary to carefully separate the blade from the petiole (see Fig. 2). The physiological age of the leaf must be kept consistent all throughout sampling.

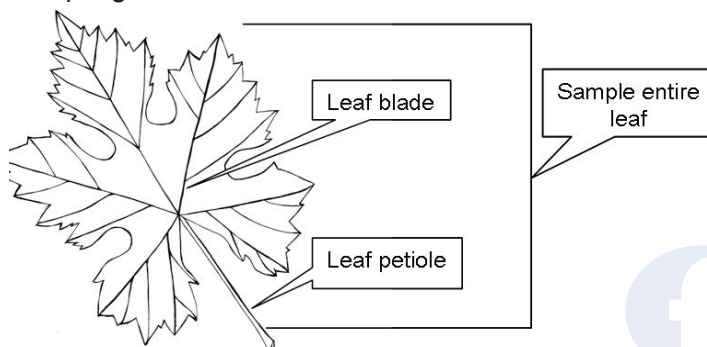


Fig 1. Grapevine leaf illustrating both parts; blade and petiole.



Fig 2. The separation of blade from petiole.

Where to collect samples?

It is important to collect leaves from the same area of each vine to maintain consistency of leaf age. Take samples from each variety separately, walk each block fully and collect leaves from random plants. The goal is to collect a composite sample of the block. The recommended protocol is to collect the leaf opposite the first cluster (this is the cluster closest to the bottom of the shoot) during full bloom (see Fig. 3 and 4). During veraison, the sample will be collected from the fifth leaf on the shoot. The fifth leaf will be the youngest, fully developed leaf. It is very important to choose healthy and complete leaf tissues; avoid collecting leaves that have been injured by insects, disease or other factors.



Fig 3. and Fig. 4 Grapevine shoots indicating sample location during bloom.

Tips for successful sample collection

- It is important to consider consistent parameters for sampling: soil, variety, rootstock, vine vigor, trellis system, soil management, etc. Samples must be representative of the block.

- Generally, between 60 and 100 leaves per block are collected depending on leaf and block size. The leaves have to be healthy, completely developed and coming from fruitful shoots. If you question how many leaves to collect, it is always better to collect more, the lab can dispose of extras if necessary but they cannot add more.
- When there are symptoms of nutritional imbalance, it may be useful to submit two samples. Leaves with and without symptoms can be collected and analysed separately. When you receive the results you will then be able to decide if different management strategies need to be made to account for the differences.
- The bags have to be clean, with good aeration and good identification. Brown paper bags are a great choice for storing samples. It is not recommended to take samples on Fridays, as the samples will deteriorate over the weekend. Samples must be delivered to the lab within 24 hours of sample collection.
- Ensure that sample identification names are kept consistent between blooming and veraison; and from year to year. This is very important for tracking results over time, and being able to easily compare them year to year. It may be useful to draw a sketch of the vineyard and include the names of each sample location on the map, especially when samples are being sent to a consultant.
- It is useful to make note of when treatments have been made to the grapevines prior to sampling. Especially if a nutrient result comes back much higher than anticipated.
- If you are sending samples to a new lab, it will be beneficial to contact them beforehand to determine if they have a preference for sample packaging.

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