

Vineyard Fertilization

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It is nearing time to start applying fertilizer if you have not done so already. In the past we would apply fertilizer in early spring before bud break because we had some time before spring work really got started. We had finished pruning, tightened the wires, tied up the vines, replanted missing vines and removed our hills on the vinifera. **Now what?** Let's throw on some fertilizer and get that done so we can go on to some other operation.

Is timing of fertilization really that important? The following excerpts are from an earlier report out of the Vineyard Vantage. A report by Eric Hansen indicated that multiple applications of nitrogen may be needed to maintain sufficient nitrogen in the root zone over the extended period of peak demand, particularly on sandy soils. Efficiency of nitrogen uptake may also be affected by fertilization placement and rate. Greatest absorption may be achieved when fertilizer is applied over the soil containing the most grapevine roots, which is normally the herbicide strip immediately under the trellis. This is most important in younger vineyards where the root system is not as extensive. As a general rule, the percentage of fertilizer nitrogen absorbed decreases as the rate of nitrogen increases. Although some growers apply high rates of nitrogen in a single application, greater efficiency of nitrogen uptake may occur from multiple applications banded beneath the vine when the vine demand is high. Studies have shown that application of nitrogen while grapes are dormant is inefficient because a high percentage of the applied nitrogen is leached from the soil before uptake by the vine. Vines absorb nitrogen relatively slowly between budburst and bloom, most rapidly between bloom and veraison and then slow down between veraison and harvest. Thus the most efficient time to apply nitrogen would be shortly after bloom when the vines are growing rapidly.

Application Rate: Generally we apply approximately 50 pounds of actual nitrogen per acre each year to juice grapes with lower rates (30 pounds) applied to wine grapes. The **actual nitrogen** that you apply is calculated by taking the form of nitrogen that you are applying such as ammonium nitrate, which is 33% nitrogen and multiply the weight of a 50-pound bag of ammonium nitrate which will give you 16.5 pounds of **actual N** that you are applying per bag. Approximately three 50-pound bags will give you 50 pounds of actual N per acre if applied at 0.27 pounds of ammonium nitrate per vine at an 8 foot by 10 foot spacing (545 vines/acre). **Example 2:** Urea (45% N) x 50 lb bag of Urea = 22.5 lbs of **actual N/bag**. If you are going for 50 lbs of **actual N** per acre then: 50 lbs/acre divided by 22.5 lbs of **actual N** = 2.22 bags per acre using Urea at the 50 lb per acre rate.

Training systems that permit large vines such as **Geneva Double Curtain (GDC)** require higher application rates of 75-100 pounds of actual N per acre. Larger amounts are best applied as split; half rate applied by bloom and the second half by veraison. Younger vineyards require less nitrogen usually in the 15 to 20 pounds of actual nitrogen per acre. Nitrogen is readily available between the pH values of 6.0 and 8.0, but becomes less available at lower or higher pH levels.

We would like to see pH values around 6.0 to 6.5. The American varieties can tolerate lower pH values of 5.5 better than vinifera type grapes. Liming should be done after you have tested your soil and determined a need and the absolute best time to lime is well in advance of planting so that you can incorporate the lime into the soil 8 to 12 inches deep. The pH is much more difficult to correct after the planting because of the slow movement of the lime through the soil. Lime can also increase the availability of other elements such as phosphorus, calcium, magnesium, and molybdenum. The dolomitic lime can be used to raise the magnesium content in the soil and pH and a calcitic lime can be used to raise the calcium content as well as the pH in the soil. If the soil pH was not corrected before planting the pH may be raised over time with multiple applications of lime of 2 to 2.5 tons per acre twice a year.

Can Potassium additions help? Next to nitrogen we have to consider Potassium as one of the next most important elements to maintain good vine health and sugar development. Application rates should be based on vine vigor, soil tests, and petiole analysis. For soil applications 100-400 pounds per acre of 0-0-60 is recommended. The number of applications may be higher in clay and sandy soil if the pH is above 6.5. Apply potassium in 2-foot bands under the trellis to assure that the major portion of the material will be available for root uptake. Potassium can be applied anytime, but the maximum uptake will be between bud break and veraison and again immediately after fruit harvest.

Organic fertilizer? Any time you can add organic material to the fields it is going to help the health of the soil and tilth. An organic material may vary greatly in composition depending on its source. When such a material is applied as a fertilizer an unknown quantity of nitrogen, phosphorus, potassium or other elements are applied unless it has been analyzed. Cost to obtain and spread and amounts are usually higher unless a readily available source is part of the operation. Observations of growth and petiole analysis can tell you if you are getting enough nutrients to the vines. Organic materials such as mulches can have a detrimental effect of tying up nitrogen that is used by microorganisms to break down the mulch into a usable form for the vine. Additional nitrogen to feed both the vine and microbes will alleviate this problem.

What about fertilizing vines that were winter injured? The rule here is wait and see. We are definitely going to want to reduce the normal application rates of nitrogen to vines that are showing signs of winter injury. That is delayed bud break or uneven budbreak and shoot growth. If you are unsure about your crop, it might be advisable to split the nitrogen application this year and apply a half-rate at bloom (two thirds of nitrogen goes to vegetative growth, one third to fruit). If you have very few shoots, this may be a year to not apply nitrogen. Watch for nitrogen deficiency symptoms (thin weak growth, light green foliage). If symptoms develop, apply a foliar spray of urea around veraison. Foliar sprays can be a corrective for deficiency symptoms, but are not a permanent solution to vineyard fertility problems.