

Vineys
Viticulture Information News, Week of 25 April 2016
Columbia, MO



Grape Nutrient Management and Soil pH

Over the past few months I have been looking at a lot of soil analysis and tissue analysis reports. In some cases I will receive a soil analysis results and no tissue analysis report and vice versa. This has made me wonder if there is some confusion among grape growers on what analysis they should be doing. I have read a lot of grape growing guides that promote soil analysis before establishing grapes and then recommend petiole sampling after establishment. This is poor advice. You need to perform both soil and petiole analysis on a routine schedule. I say this because one of the greatest limitations for nutrient uptake by plants is a change in soil pH (Figure 1).

Soil pH is a measure of the concentration of hydrogen ions. Hydrogen ions are cations. At soil pH of approximately 4.5 or lower, Aluminum is in higher concentration than hydrogen ions. Aluminum ions reduce the growth of grape vines by inhibiting root growth. Aluminum ions are not taken up by the roots of grapevines and therefore Aluminum will not be found in petiole sample results. The addition of lime to the soil increases soil pH and decreases the availability of aluminum.

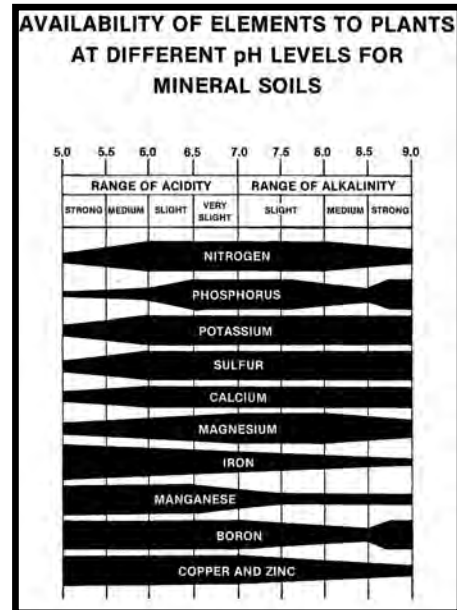


Figure 1. Availability of nutrients to plants at select pH ranges. Image credit: <http://www.spectrumanalytic.com/>

Some grape cultivars can grow in low soil pH soils. Grape cultivars with *Vitis lambrusca* genetic backgrounds can tolerate soils that have pH values below 5.6. Grape cultivars with more of a *V. vinifera* background will grow poorly in these same acidic soils. So the question becomes, what about the hybrid grape cultivars. The growth of hybrid cultivars on acidic soils is dependent on the parental background of the parents. If the hybrid has more *V. vinifera* as genetic background, then expect it to perform poorly in low pH soils. Vice versa for a hybrid with more *V. lambrusca* in its genetic background.

Regardless of genetic background of your grape cultivar, soil pH can be adjusted to grow most grape cultivars. Lime can be added to low pH soils to increase soil pH and sulfur can be added to high pH soils to reduce soil pH. In most instances in Missouri, soil pH is on the acidic end of the pH scale. Therefore in order to maintain the soil pH that is conducive to vine growth lime is added.

The problem is that lime is not very reactive when just broadcast applied on the soil surface. Lime will neutralize soil acidity best when incorporated into the soil. In established vineyards this becomes a difficult task. Some methods employed are trenching along the vine row and banding the lime, or broadcast applying and using an implement such as a weed Badger to incorporate the lime. Another potential option is to apply liquid lime. Liquid lime will react faster, but needs to be reapplied more often.

There are two types of liming materials. Agricultural lime or Aglime is mainly calcium carbonate. Whereas dolomitic limestone contains both calcium carbonate and magnesium carbonate. Dolomitic lime is often only used in low pH soils that have a magnesium deficiency. When adding dolomitic limestone it is important to know the potassium level of the soil. Both potassium and magnesium are positively charged ions or cations and often soils high in potassium will express magnesium deficiency even when soil magnesium levels are high.

Soil pH values of 5.5 or lower are considered strongly acidic and often will result in grapevines showing nutrient deficiencies. I recently pursued some soil analysis results from a 2 acre vineyard that had the following soil pH results; 7.0, 4.7, 4.6, 4.3, 4.5, and 4.0. I believe this vineyard had lime applied at establishment about 10 years ago and additional lime has not been added since. Results also showed that the soil was rated high in magnesium and low in calcium. In this case, Aglime (calcium carbonate) would need to be added to the soil. The problem is that the soil pH has gotten so low that to bring the vineyard up to a pH 6.0 would require the addition of 5.25 tons/acre. In established vineyards, lime applications should not exceed 2 to 3 tons per year. Here we are likely looking at split applications and deep incorporation using a chisel plow or some other incorporation. Another problem likely encountered will be root damage to the grapevines.

For information on soil testing see [MU Soil Testing Services](#)

Scouting – Be Alert

A lot of powdery mildew has infected other plants (Kentucky bluegrass cultivars susceptible to powdery mildew, ornamental landscape plants such as beebalm, *Monarda* spp. and vegetable plants) over the past couple of weeks. Meaning environmental conditions have been conducive for powdery mildew development. I have not observed nor have I had reports of powdery mildew developing on grape tissue. Vineyard blocks that had high levels of powdery mildew infections last season should be scouted as well as grape cultivars (Chambourcin, Vidal blanc, Vignoles) that are highly susceptible to powdery mildew. Temperature conditions have been ideal for powdery mildew development. Powdery mildew thrives at mid-60's °F to mid-80's °F. Remember powdery mildew does not need wet tissue for infection and thrives under high humidity conditions. When scouting for powdery mildew this early in the season focus on areas where grape tissue is shaded as within these areas high humidity often results. Also scout younger grape leaves, as fully mature leaves develop age related resistance to powdery mildew.

Sending Pictures for Pest Identification or Abiotic Problems

Over the past year many of you have sent me pictures to identify problems occurring in your vineyards. I appreciate all the pictures and in addition many of the pictures help educate others about problems that occur in vineyards. Please keep sending pictures. When sending pictures of a potential problem, take a close-ups of the problem and also take in picture of the whole vine (See the examples on right). Providing these two types of pictures helps in the diagnoses.

In addition, please send a short narrative with the pictures that includes the grape cultivar, pesticide spray history, and any other information that your believe may be of importance.

When diagnosing the problem I often consult with Patricia Hosack, Director of the MU Plant Diagnostic Clinic. Patti is a great resource in diagnosing problems in all plants including grapes. If we cannot determine the problem from the pictures, we will ask you to submit samples to the Plant Diagnostic Clinic.

For more information on the [MU Plant Diagnostic Clinic](#)



A 4-year old Norton vine (above) in which the grower thought had egg- or seed-like growths near the petiole shoot junction (below and inset).

Diagnoses: Guttation droplets that occur in rapidly growing vines under high soil moisture conditions and high humidity. The leaves cannot transpire water fast enough and built up water pressure pushes out water droplets that contain minerals/phloem sap.

Cumulative Growing Degree Days for the Seven Grape Growing Regions of Missouri from April 1 to April 25, 2016.

Region	Location by County	Growing Degree Days ¹		
		2016	2015	30 Year Average
Augusta	St. Charles	212	257	212
Hermann	Gasconade	237	242	226
Ozark Highland	Phelps	256	272	236
Ozark Mountain	Lawrence	267	248	238
Southeast	Ste. Genevieve	244	264	239
Central	Boone	230	236	212
Western	Ray	219	213	201

¹Growing degree days at base 50 from April 1 to April 25, 2016. Data compiled from Useful and Useable at <https://mygeohub.org/groups/u2u/tools>. Click on link below to determine growing degree days in your area.

To determine the number of growing degree days accumulated in your area since April 1, click this link [Search for GDD at your location using this tool](#).

Please scout your vineyards on a regularly scheduled basis in an effort to manage problem pests. This report contains information on scouting reports from specific locations and may not reflect pest problems in your vineyard. If you would like more information on IPM in grapes, please contact Dean Volenberg at 573-882-0476 or volenbergd@missouri.edu