

# Texas Gulf Coast Vineyard Update March 2009



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### Spring nitrogen & boron fertilization in vineyards

Many growers have been questioning how the droughty 2008 growing season may have affected their vines coming into the 2009 season. This topic was touched upon in a talk I presented at the 2009 Annual Gulf Coast Grape Grower Field Day back in February. Nitrogen and boron were the nutrients that I emphasized for the Gulf Region during that presentation. Some of the highlights from that presentation are discussed below.

#### Nutrients and drought

Many nutrients, including nitrogen (N) and boron (B) are taken into grapevine roots via mass flow of the water solution in soil. Therefore, for N to be taken up by vines, there has to be both plant available water and a healthy root system to allow for uptake. Both rainfall and irrigation water will aid in the uptake of N and other nutrients from the soil solution.

Regardless of the efficacy of a given irrigation system, one might presume that prolonged periods of drought will reduce total functional root area. A decrease in root area can result in less water uptake and less surface area of soil that is exploited by roots in search of nutrients. Furthermore, certain quantities of N and other nutrients are removed from the vineyard each year in the form of crop, and cane wood from pruning. Currently, no vineyards that I am aware of in the Gulf Coast are factoring in this nutrient removal each year when determining their fertilizer inputs.

There is no direct measurement that a grower can use to determine amount of root loss or growth. The best a grower can do at this time is to keep good records of seasonal rainfall and irrigation usage and to plot that data over the calendar year. Grapevine roots will inevitably grow and die back over the course of the season and vineyards that experience little rainfall and large gaps

between watering (including the dormant period) may suffer greater loss of functional root area. My extension colleagues in the Hill Country and West Texas regions had observed micronutrient deficiencies in several vineyards that applied no water at all nor received rain throughout the winter season in 2007-2008. In some vineyards this resulted in stunted spring growth, which mirrored text book examples of zinc and boron deficiency. This is an instance where I am comfortable with a diagnosis based on observational data alone. The good news is, severe root loss can be reduced by proper irrigation and strategic fertilization may help mitigate drought induced nutrient deficiencies.

#### Nitrogen in grapes

Proper nitrogen (N) balance is essential for the seasonal health of grapevines and the longevity of vines within a vineyard. Nitrogen deficient vines will display uniform yellowing or pale leaves on entire shoots, and will have difficulty filling the allotted trellis space. It is difficult to predict N requirement simply by looking at vines, and it is often too late to influence the current season N status if fertilizers are applied after deficiency symptoms appear. Plant tissue analysis is a very useful method for determining fluctuations in N status from season to season. This is why it is recommended to submit grape petioles for nutrient analysis every one to two years. The normal range for N in bloom petioles is 1.2 to 2.2%.

Too much N can also present quality issues in the vineyard. Over-fertilization with N can lead to excessive vegetative growth in the canopy, large “bull cane” production, increased shading and disease of fruit, and reduced fruit set (shoot tip growth can compete with developing flowers). To avoid over-fertilization with N or other nutrients it is important to understand how

the previous season’s weather and fertilization have influenced the current season. For example, if N was broadcast to the vineyard soil last spring, and there was no significant rainfall to work it into the soil, it may not have been effectively taken up by vines. Depending upon the form of N, some of the fertilizer may have been lost to volatilization since last year (e.g. urea). This scenario may result in petiole test showing low N, even though it was applied the previous year. In some cases, a good rainfall will make N available again. Otherwise, in a dry season it may be helpful to have the ability to fertilize using your irrigation system.

#### Nitrogen fertilization in vineyards

If you feel that your vines may benefit from a maintenance application of N this year, now is the time to begin planning. Several growers have called or written to inquire about rates and products. In most cases, if 2008 petiole tests showed less than 1.5% N and there was no fertilizer added to the vineyard, I recommended a maintenance rate of 20 to 30 # of N per acre. Several forms of N fertilizer are available. Below are some examples of N fertilizers and the product rates required to achieve a maintenance rate application of 20 lb/acre of actual N:

**MAP (monoammonium phosphate) (11% N)**  
20 lbs N =  $20/0.11 = 181$  lbs MAP/acre

**DAP (diammonium phosphate) (18% N)**  
20 lbs N =  $20/0.18 = 111$  lbs DAP/acre

**Calcium Nitrate (16% N)**  
20 lbs N =  $20/0.16 = 125$  lbs product/acre

**Ammonium Sulfate (21% N)**  
20 lbs N =  $20/0.21 = 95$  lbs product/acre

**Urea (46% N)**  
20 lbs N =  $20/0.46 = 43$  lbs product/acre

The type of fertilizer a grower chooses is often based on economics and availability, however, some products are better suited for acidic or basic soils. For example, Ammonium sulfate is commonly used in vineyards in the Gulf Coast because it is relatively inexpensive and readily available. If both phosphorous and N are needed, MAP or DAP will also provide some phosphorous. In general, fertilizers containing ammonium-N will have an acidifying effect on soil. Alternatively, calcium nitrate will add N without causing a decrease in pH.

Thus, you may choose N fertilizers that will have the desired effect on soil pH. This is why it is often recommended that ammonium sulfate be used in “gumbo” clay soils of pH 7.0 and above, and Calcium Nitrate be used in soils below pH 6.0. Prices vary widely, so you may want to start calling suppliers to inquire about prices and availability. Knowing the % N in the product allows you to compare prices on a price per unit N basis, rather than price per pound of product.

#### Nitrogen application & timing

Nitrogen use in winegrape vineyards is most efficient if applied in a band under the vine rows or through a drip irrigation system. If your vineyard is not set up for fertilizer injection or “fertigation,” then it is generally best to get the N applied early in the season, and then hope for a rainfall to work it into the soil. Most growers in that category will apply N just after budbreak.

Work from Michigan State has shown that N uptake is more efficient if applied from the time of bloom to six weeks after bloom. Because shoot growth is stimulated by N, applications made just prior to bloom may stimulate shoot competition with flowers, potentially reducing fruit set. This can be the case if moderate to high rates of N are

applied between the period of budbreak to bloom. Moderate to high rates of N are not usually recommended unless bloom petiole samples contain less than 1.0% N. In an ideal situation, a moderate to high rate of N (30-50#/acre) could be split into two applications; one just after bud break, followed by a second just after fruit set is completed. Alternatively, the N application could be split by applying one half of the rate after fruit set followed by the second half immediately after harvest, to coincide with the late season flush of root growth. For those with fertigation potential, this “spoon feeding” method is quite feasible. Nitrogen fertilization is discouraged between the time of veraison and harvest, as a reduction in vegetative vine growth is desired in favor of fruit maturation.

#### Boron fertilization in vineyards

Boron (B) is a micronutrient that is often low in vineyard soils in the Gulf Coast. Many growers apply B as a foliar nutrient spray, 2 to 4 weeks before bloom. Boron has been shown to improve pollen tube formation in grapes and other tree fruit and nut crops, thus improving fruit set. An extension research trial in progress in Austin County has shown that B is effectively taken up by Blanc Du Bois vines when sprayed 4 weeks prior to bloom. Research on the effects of B on fruit set and yield of Blanc Du Bois are not complete at this time, but because B is often low in both soil and petiole reports in the Gulf region *and* it is an inexpensive material to spray (about \$10 per acre/application), I will continue to recommend its use at this time. This is particularly the case after the dry 2008 growing season.

#### Types of boron fertilizer:

Borosol 10 (10% boron)  
Solubor (20% boron)  
Borax (11% boron)  
Borate-46 (14% boron)  
Borate-65 (20% boron)

Boron can be toxic to green growing tissue if used in too high of a concentration (Figure 1). No more than 0.5 pounds per acre of boron should be applied at one time (2.5 pounds per acre of Solubor or 1.8 quarts of Borosol 10). Some growers opt for a split application, applying two sprays of 0.25 pound B per acre (1.25 pound of Solubor or 0.9 quart of Borosol 10) before bloom. At the 0.25 lb B rate, the boron can safely be mixed with fungicides such as Dithane to maximize spray efficiency. Spring foliar sprays are timed at 6-10 inch shoot growth and 14 days later.



**Figure 1:**

Note: To reduce risk of foliar burn, do NOT apply boron sprays at less than 14 day intervals or tank mix boron with water-soluble packages, oil, or surfactants. Applications after the commencement of bloom may alter or “spike” results obtained by petiole analysis at full bloom.

## **Trimming of new bare rooted hybrid grapevines**

Another common question in the extension office this winter has been with regards to trimming or pruning of dormant, own-rooted hybrid grapes for new vineyard plantings. It is not unusual for bare rooted cuttings to arrive from Texas nurseries containing numerous spurs and higher than the desired number of dormant buds.

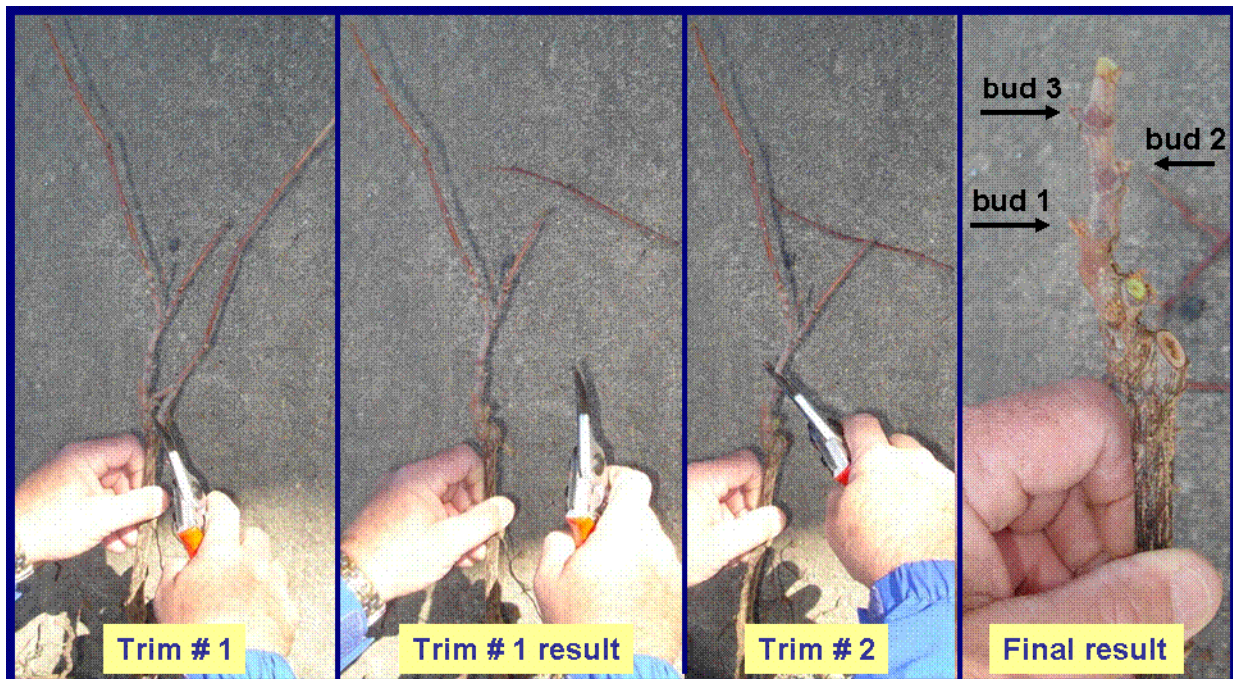
Recall that the goal in the first season is to establish a strong root system and start forming the perennial trunk wood.

Technically, only one shoot is required to do this. However, I am most comfortable recommending about 2 to 3 buds per vine. This allows a grower to distribute the growth into multiple shoots in the first season, which may help reduce vine vigor and the incidence of bull cane production. Additionally, the grower has the chance to select the best of the shoots to retain for a trunk when dormant pruning, not to mention, having a spare shoot in the event of seasonal shoot breakage.

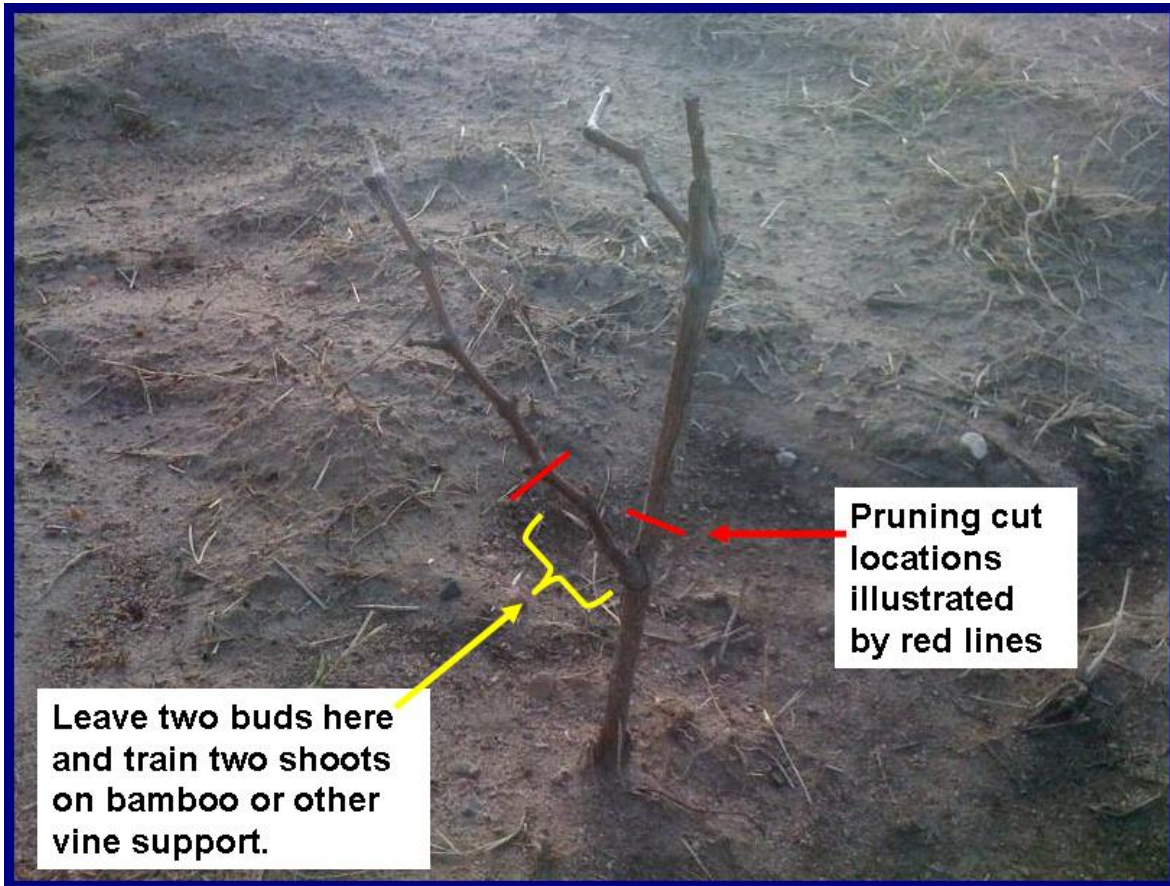
I was able to demonstrate the trimming process on a recent extension visit and thought that some photos might be helpful to post here. If vines were simply planted and watered in, and growth has already commenced, it is still not too late to get in the vineyard and adjust bud or shoot numbers on individual vines. Below are some examples of dormant pruning (Figures 2-4).



**Figure 2:** Photograph showing how to prune a dormant rooted vine before planting. The 1 and 2-year-old wood of a dormant Black Spanish grapevine are illustrated. Three buds were retained on the 1-year-old wood, each of which will produce a shoot during the growing season.



**Figure 3:** Photograph showing the step-by-step process of trimming an own-rooted Black Spanish grapevine before planting. In this example, 3 buds were retained on the 1-year-old wood, each of which will produce a shoot during the growing season.



**Figure 4:** Photograph showing where to prune a dormant, own rooted Black Spanish grapevine after planting. In this example, 2 buds were retained on the 1-year-old wood, each of which will produce a shoot during the growing season.

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**2009 Upcoming Viticulture Events**

**Sprayer Calibration Workshop**

**April 8:** 3-6pm

Excellent disease and pest management is dependent upon the proper use and delivery of agricultural products. At this workshop your viticulture extension advisor will demonstrate the step-by-step process of calibrating an airblast sprayer and herbicide sprayer. Small vineyard equipment will also be calibrated in the demonstration. This workshop is free and open to the public.

Please register via email to: [fawestover@ag.tamu.edu](mailto:fawestover@ag.tamu.edu)

Location: Austin County Vineyards, 13302 FM 1094, Cat Spring, TX, 78933

**6th Annual Texas Pierce's Disease Research Symposium.**

**April 16**

Time: 8:30 - 5:00

Location: Thurman Mansion, Salt Lick Pavilion, Driftwood, Texas

Contact Jim Kamas for further information: [j-kamas@tamu.edu](mailto:j-kamas@tamu.edu)

## **Vineyard Field Meeting**

**May 28:** 3-5pm, Summer meeting, (location & topics TBA)

The Gulf Coast Regional Field Meetings offer an opportunity to keep updated on current viticulture practices and to communicate with the wine and grape community of your region. These meetings are also a great opportunity to get out and see other vineyards. The field meetings are free and open to the public. For more information, email: [fawestover@ag.tamu.edu](mailto:fawestover@ag.tamu.edu)

## **Texas Viticulture & Enology Research Symposium**

**June 2-3**

The first annual Texas Viticulture & Enology Research Symposium will provide reports on the latest results by researchers from Texas A&M and Texas Tech University. Guest speakers will provide updates on recent research from other states.

Location: Granbury Resort Conference Center, Granbury, Texas

Contact Ed Hellman for further information: [ewhellman@ag.tamu.edu](mailto:ewhellman@ag.tamu.edu)

## **Prospective Winegrape Grower Workshop – Houston**

**June 8:** 9am-3pm

This one day workshop is designed for individuals considering planting a commercial vineyard in Texas. Topics will include site considerations, risks, costs, labor requirements, necessary expertise.

Cost: \$125/person, \$200/couple (includes lunch)

Register at: <http://agrilifevents.tamu.edu/>

For a complete list of Prospective Wine Grower Workshops around the state of TX visit:

<http://winegrapes.tamu.edu/prospective.html>

## **Advanced Wine Grower Workshop – Tour of training systems for hybrid wine grapes**

**June 9:** 1-5pm

This workshop is part of a series of Advanced Grape Grower workshops that will be conducted across the state by the Texas AgriLife Extension Viticulture Team. Three vineyards will be visited during this workshop, each with a unique training system for growing hybrid winegrapes. During this tour, growers will be able to evaluate Geneva Double Curtain, Vertical Shoot Positioned, High Munson, and the Smart Dyson Ballerina training systems. The focus of this meeting will be to describe the potential advantages and disadvantages to the above systems and to critique the effects of each system, with respect to yield and quality potential. Advanced canopy management techniques will be demonstrated by the instructors. All vineyards are planted with standard white and red hybrid winegrapes for the Gulf Coast Region. This Advanced Grower Workshop will be co-instructed by Texas AgriLife Viticulture Extension Associates, Fritz Westover (Gulf Coast) and Teresa Burns (West Texas). Additional assistance will be provided by Austin County ANR Extension Agent, Philip Shackelford.

**Cost:** \$25 (includes refreshments)

**Location:** The workshop begins and ends at Austin County Vineyards, 13302 FM 1094, Cat Spring, TX, 78933. Carpool transportation for the tour will be provided.

Register at: <http://agrilifevents.tamu.edu/>

For a complete list of Advanced Wine Grower Workshops around the state of TX visit:

<http://winegrapes.tamu.edu/resources/advanced.html>

## **Additional Events**

For a list of additional Texas wine & grape events visit: <http://winegrapes.tamu.edu/news/events.html>

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As always, feel free to contact me if you have any questions or comments.

Best regards,

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