



**University of California Cooperative Extension:
El Dorado and Amador Counties**



Foothill Vineyard News

*A newsletter produced for foothill wine grape growers and grape industry by your local
Cooperative Extension Farm Advisor, Lynn Wunderlich*

ISSUE #1

MAY, 2007

Hello! You may have heard that foothill grape growers have a new Farm Advisor. After years of valuable service to Cooperative Extension, Donna Hirschfelt moved on last fall to work with UC Davis Extension. (Many of you are familiar with UCD Extension, since Donna teaches several viticulture courses there). In Donna's absence, I have agreed to expand my job duties to include viticulture for Amador and El Dorado counties. One of the first projects I have been working on is contacting you for a time to interview you with a short survey I have. This will help me understand the issues you face and help me to prioritize my work so when I call I hope you will agree to meet with me.

I have also been working on organizing Foothill Grape Day, which will be held this year at the Amador Fairgrounds in Plymouth on June 14. You should have received a notice for Grape Day already. You can see the agenda and sign up online at <http://ceeldorado.udavis.edu>. We have a good line up of speakers and it should be a fun day, with lunch and a glass of heritage zin to top it off. Next year we will plan to hold Grape Day in El Dorado county. Much thanks to the Amador Grape Growers Association for helping plan this year's event.

I look forward to working with all of you to sustain and improve the wine grape production of our unique and beautiful area. You can contact me directly at 530-621-5505.
See you all at Foothill Grape Day, June 14!

Lynn Wunderlich
Farm Advisor, El Dorado and Amador Counties

IN THIS ISSUE:

- **USE OF TISSUE ANALYSIS FOR NUTRIENTS-PETE CHRISTENSEN**
- **GOT TURKEY PROBLEMS? UC-DAVIS RESEARCHERS WANT YOU!**
- **TOP 9 REASONS WHY IT MIGHT BE DIFFICULT TO SELL YOUR GRAPES-
RON MANSFIELD GIVES PRACTICAL ADVICE**
- **GRAPE DAY IS JUNE 14- SIGN UP NOW!**

USE OF TISSUE ANALYSIS IN VITICULTURE
PETER CHRISTENSEN, EXTENSION VITICULTURIST EMERITUS
DEPARTMENT OF VITICULTURE AND ENOLOGY, UC DAVIS

Note from Lynn: Tissue analysis, done properly, can give valuable information for determining a vine's nutritional status and guiding a fertilizer program. How and when you sample can affect your results, and is based on what type of information you are seeking. Bloom time, here now, is the best time to sample when evaluating your fertilizing program. I recently came across an article by Pete Christensen, Extension Viticulturist Emeritus, with the Department of Viticulture and Enology at UC Davis. I asked Pete if I could share some of the key points here. The entire article is available on my viticulture website page at <http://ceeldorado.ucdavis.edu> or <http://ceamador.ucdavis.edu>.

Tissue analysis is a direct measure the vine's mineral nutrient status. Mineral concentrations in select tissues can account for a vine's root uptake, mobilization, accumulation and demand of most nutrients. However, there are limitations. Nutrient levels vary with tissue type, growth stage, shoot and canopy position, cultivar and growing season. Critical values or standards must be established with these variables in mind. Ongoing experience and data collection is still needed in our widely differing vineyard conditions and regions.

SAMPLING

The method of sampling is dependent on the objective: (1) survey of nutrient status, (2) follow-up nutrient sampling, and (3) diagnosing visual symptoms and disorders.

1. Survey of nutrient status.

This approach is used when surveying a vineyard for general nutrient status and evaluating fertilizer needs or practices. Most of the data and experience in California are based on leaf petioles sampled at bloom. The petioles are taken from opposite flower clusters near the base of the shoot. This provides a clean, easily sampled, repeatable tissue that tends to accumulate nutrients more than other plant parts. The samples should be taken during bloom, the nearer to full bloom the better ("full bloom" is when approximately two-thirds of the caps have loosened or fallen from the flowers). The full bloom sample assures that the tissue will be at the same physiological stage regardless of district and seasonal differences.

Samples should be taken from a single block or management unit and should represent a single variety and rootstock. Areas of distinctly different soil, vine appearance, or other condition should be sampled separately. Each sample should consist of 60-80 petioles collected from representative vines uniformly distributed over the area. Sample from minimally shaded, normal growing shoots on both sides of the vine canopy. Some laboratories may request 100 petioles per sample when petioles are small (e.g. Pinot noir and Gewurtztraminer) or multiple analyses are to be run.

Growers who routinely sample vineyard blocks from year to year may wish to designate specific rows or vines in a representative area. Re-sampling the same vines each time improves consistency in the results when tracking the vineyard's nutrient status and adjusting fertilizer practice over years.

Foliage contamination from a nutrient spray will give erroneous laboratory results. Do not sample after a nutrient spray unless you: (1) are not analyzing for any nutrient element

contained in the spray, (2) thoroughly wash the samples (see HANDLING SAMPLES below) or have made arrangements with the laboratory for sample washing, or (3) are sampling uncontaminated tissue later in the season. Sampling uncontaminated tissue is preferable, as it is difficult to remove all the nutrient residue, especially when adjuvants are used with the spray.

2. Follow-up nutrient sampling

Certain nutrients that are in the questionable range at bloom can be re-checked later in the season to determine if deficiency has developed. This is particularly useful with K, which declines in the vegetative parts and can become deficient during fruit ripening. Sampling is best performed at veraison (berry softening at beginning of ripening) as it represents a physiological stage with supportive data and when leaf tissue is still healthy and functioning. Select petioles from recently matured leaves. This would be the second fully expanded leaf, usually the 6th to 7th leaf from the tip, on an actively growing shoot. The sample leaves should have the color and texture of the other mature leaves rather than the lighter and more shiny, tender appearance of young, expanding leaves.

The smaller petioles at this time may require a higher number in the sample as compared to bloom. Take 75 to 100 petioles per sample if more than one determination is needed. For blade samples, 25 to 35 are sufficient due to their greater mass as compared to petioles.

3. Diagnosing visual symptoms and disorders

Visual deficiency or toxicity symptoms more commonly appear during mid-summer to harvest time. Thus, sampling at this time is useful in diagnosing vine disorders or verifying a deficiency or toxicity. For such situations, sample the affected leaves regardless of location on the shoot and at any time when abnormal appearance is noted. When there are no reasonable clues, take both the petioles and blades but analyze them separately. If sodium (Na) and/or chloride (Cl) toxicity are suspected, analyze only the petioles (these elements accumulate in the petioles, even though the blades may show the symptoms). For excess boron (B), use blades where much greater levels will be found.

It is also a good practice to take a sample of "non-symptom" tissue for comparison when the cause is in question. The "non-symptom" sample can be taken from an area adjoining the "symptom" area while making sure that the comparative samples are taken from the same position on the vine.

HANDLING SAMPLES

Place each sample in a well-labeled, clean paper bag and deliver to the laboratory as soon as possible. If there is a delay, keep the bags open in a dry, well-ventilated place. This will begin the drying process and prevent molding. Never use plastic bags.

Petioles need not be washed unless collected from a dusty vineyard or have residue remaining from a nutrient spray. Leaf blades have a greater surface area for collecting dust and should be washed if they are noticeably dirty. Foliar nutrient sprays can be difficult to wash off because of the adjuvants that are sometimes used. Wash in water containing a small amount of detergent followed by a tap water rinse and two distilled water rinses. Remember, however, that some elements (particularly potassium (K), Na, and Cl) are easily leached from necrotic or dead tissue. Washing should therefore be accomplished quickly, and excess water blotted from the leaves. Blades, in particular, should be dried

quickly to avoid mold growth. Refrigeration is also a way to maintain sample freshness if there is a delay in getting samples to the laboratory for washing.

A forced-air or well-ventilated oven at 60° to 80°C (140° to 176°F) is ideal for sample drying. Growers have also successfully dried samples in a vehicle parked in the sun with the windows slightly open.

INTERPRETATION OF LABORATORY ANALYSIS

The following interpretations in table 1 give critical values for important grapevine nutritional elements in opposite cluster petioles at bloom unless otherwise noted. The deficiency level is that at which deficiency symptoms may develop and/or a measurable response to fertilization with the nutrient in question can be expected.

Critical levels for nitrate-nitrogen (NO₃-N) are only established for Thompson Seedless. The levels for other nutrients are based on experience with several or more varieties and thus can be applied generally among varieties, as far as is known.

Table 1. Interpretive Guide for Grape Tissue Analysis at Bloom and Veraison

Nutrient	Deficient (below)	Adequate (above)	Excessive ² (above)	Toxic ³ (above)
NO ₃ -N, ppm	350 ¹	500	2,000	8,000
P (total), %	0.10 (0.08) ⁴	0.15 (0.12) ⁴		
K (total), %	1.0 (0.5) ⁴	1.5 (0.8) ⁴		
Mg (total), %	0.2	0.3		
Zn (total), ppm	15	26		
Mn (total), ppm	20	25	300	2,000
B (total), ppm	25	30		80 (100) ⁴ 120 (300) ⁴ in blades
Na (total), %				0.5 0.3 in blades
Cl (total), %			0.5-1.0	1.5 0.5 in blades

¹Critical NO₃-N levels are based on Thompson Seedless data only. Some laboratories report as % NO₃. Multiply % NO₃ by 2258 for ppm NO₃-N (i.e. 1.0% NO₃ = 2258 ppm NO₃-N).

²Excessive levels may be cautionary rather than indicating known effects on vine performance.

³Critical toxicity values are not well defined due to variety, growing condition, and seasonal differences.

⁴Veraison (berry softening) petiole values are in parenthesis.

A note about Phosphorus

Phosphorus (P). Confirmed deficiencies are uncommon in California, although they are increasingly recognized in some coastal and foothill sites, especially in acidic and high Fe soils. Tissue analysis has been useful in separating them from similar-appearing problems such as Leafroll Virus and Willamette Mite injury. Petiole P levels tend to decline through the bloom period and level off through midsummer; hence, critical levels change somewhat during the season. Differences among mature leaf

petioles along the shoot are minor. Levels in the same vineyard can fluctuate as much as 100% from year to year.

There are wide differences among grape varieties and rootstocks. Rootstocks which tend to increase P levels include Ramsey, 110R, 1103P, and St. George; rootstocks associated with lower P levels include 039-16, 3309C, 420A, 101-14Mgt, and Harmony.

SOME LABORATORIES TO SEND SAMPLES TO.

The names and companies provided in this listing are for informational purposes only and do not constitute any endorsement or recommendation by the University of California Cooperative Extension. A complete listing of labs accepting samples was compiled by Rhonda Smith, Farm Advisor in Sonoma county, and is available on our website. Please check to make sure the contact information given is correct.

A & L Western Agricultural Labs 1311 Woodland Ave. #1 Modesto 95351 (209) 529-4080 (209) 529-4736
www.al-labs-west.com

Agri-Analysis Associates 41533 County Road 32B Davis 95616 (530) 757-4656 (530) 757-4655 www.agri-analysis.com

Brelje & Race Laboratories, Inc. 425 South E Street Santa Rosa 95404 (707) 544-8807 (707) 544-5736

California AgQuest Consulting, Inc. 4325 N. Golden State Blvd. Suite 105 Fresno 93722 (800) 840-2767 (559) 275-5301 www.CalAgQuest.com

California Growers Laboratory Inc. 4630 W. Jennifer, Suite 104 Fresno 93722 (559) 275-3377 (559) 275-8270
www.Cagrowlab.com

Caltest Analytical Laboratory 1885 N. Kelly Rd. Napa 94558 (707) 258-4000 (707) 226-1001
www.caltestlabs.com

Dellavalle Laboratory, Inc. 1910 W. McKinley, Suite 110 Fresno 93728 (800) 228-9896 (559) 268-8174
www.dellavallelab.com

Environmental Technical Services 1343 Redwood Way Petaluma 94954 (707) 795-9605 (707)795-9384
www.entechserve.com

Fruit Growers Laboratory, Inc. 2500 Stagecoach Road Stockton 95215 (209) 942-0181 (209) 942-0423
www.fglinc.com

J L Analytical Services, Inc. 217 Primo Way Modesto 95358 (209) 538-8111 (209) 538-3966

Monarch Laboratory, Inc. 563 E. Lindo Ave Chico 95926 (530) 343-5818 (530) 343-3807
www.monarchlaboratory.com

Morse Laboratories Inc. 1525 Fulton Ave. Sacramento 95825 (916) 481-3141 (916) 481-2959 www
www.morselabs.com

Nematodes Inc. 1577 W. Front St. Suite B Selma 93662 (559) 891-9073 (559) 891-9075

Plant Disease Diagnosis 780 Palmer Road Walnut Creek 94596 (925) 937-3841 (925) 937-3841 www.pdd.biz

Precision Agri-Lab 24730 Avenue 13 Madera 93637 (559) 661-6386 (559) 661-6135 www.agdecision.net
STL-Sacramento 880 Riverside Parkway W. Sacramento 95605 (916) 373-5600 (916) 372-1059 www.stl-inc.com

Western Diagnostic Service P.O. Box 329 Clarksburg 95612 (916) 744-1380 (916) 744-1348



DO YOU THINK TURKEYS ARE CAUSING DAMAGE TO YOUR FRUIT? UC RESEARCHERS ARE SEEKING COLLABORATORS FOR STUDY OF WILD TURKEY DAMAGE IN CALIFORNIA VINEYARDS.

The wild turkey (*Meleagris gallopavo*) is a non-native bird, first released into California by ranchers on Santa Cruz Island in 1877. The California Department of Fish and Game (CDFG) released wild turkeys starting in 1908 with the intent of establishing a new species for hunting, and the releases continued until 1999, with most occurring between 1959 to 1999. During that period nearly 4,000 wild-caught birds from other western states were introduced to many locations ranging from San Diego County to Siskiyou County. As a consequence, wild turkeys are currently established in much of the lower elevation oak woodlands of the Sierra Nevada foothills and other parts of California.

The wild turkey population has recently increased noticeably in many regions of the state. The latest CDFG research estimates there were 242,000 wild turkeys, up significantly from an estimated 100,000 birds a decade ago. **Complaints of damage from wine grape growers** has led U.C. researchers Michael Delwiche, U. C. Davis Biological & Agricultural Engineering Dept., and Terry Salmon, U. C. Davis Wildlife, Fish & Conservation Biology, to investigate the nature of this damage and possible control strategies, including using turkey distress calls to exclude the birds from vineyards.

We would like to set up study sites in the foothills, to compare to Napa, Sonoma and other parts of the state. If you suspect you have turkey damage and would like to collaborate in these studies, please contact Lynn at 530-621-5505.

**NINE REASONS WHY IT MIGHT BE DIFFICULT TO SELL YOUR GRAPES
SUMMARIZED FROM A PRESENTATION BY RON MANSFIELD**

Note from Lynn: I recently attended the El Dorado Grape Growers meeting where marketing was the topic of discussion. Ron Mansfield, Goldbud Farms, a recognized grower who has been growing and marketing grapes since about 1980, gave what he called a “common sense” presentation which I found worth repeating. I asked Ron if I could summarize his talk in this newsletter and he kindly agreed. Now is the time when growers should be contacting wineries to set up for the harvest.

Reason #9. “I planted my vineyard because I like the way it looks. I like Cabernet so I planted it. Besides it will be 4-5 years before I see my first harvest, anyway.”

It is important to give serious thought to the varieties you grow before planting. Understand the qualities of your site and microclimate AND understand what cultural practices you need to implement with that particular variety to achieve the quality desired. Be prepared to be an equal partner with your winery customer. The winery needs to be in the vineyard with you during the season so that you agree on the practices for your desired outcome.

Reason # 8. “There is a winery down the road and I was counting on them to take my grapes.”

You need to do your homework. Wineries are looking for high quality grapes that produce wines that fit their profile and business plan. In addition, there are numerous logistic considerations. Small

wineries are looking for small lots that can be delivered to the winery in bins; while larger wineries are going to be looking for larger lots (20-25 tons) delivered most likely in gondolas.

There are many ways to contact wineries to see if they might be interested in your grapes. You can cold call wineries. You can visit the wineries and taste the wines they are producing. Or you can use the web to seek winery customers out. Be prepared to travel to find customers. ZAP, winemakers, Rhone Rangers and other groups are all good ways to network. You can also use the net to put the word out on what varieties you have. Or you can use a grape broker. Now, (not fall), is the time to be setting up contracts.

Reason #7. “I don’t know how many grapes I have.”

Learn how to estimate your crop. You can select and mark vines and use their clusters for a crop estimate. Don’t get tonnage greedy. You need to have quality and do not want to sacrifice that with higher tonnage.

Reason #6. “I’m not sure how to price my grapes.”

Be prepared to bargain-prices are negotiable. Research and study the state wine grape crush report to know what comparable prices are for your region. You need to know how much it costs to produce your crop-keep good records. You also need to know how much it costs to provide your winery customer with the quality they desire, how much it costs to do necessary or requested cultural operations. You need to also know harvest and transportation costs. You can be creative and negotiate a novel price per acre instead of per ton. Work with your winery to come to an agreement.

Reason #5. “I’m not sure exactly when my grapes will be ready for harvest.”

Learn to sample your grapes for sugars, pH and total acidity to help determine harvest date. Be familiar with what grapes taste like when reaching maturity. Partner with the winery and give them 2-3 weeks of measurements as you are approaching harvest. The winery has logistical considerations and needs advance notice for when to expect your grapes.

Reason #4. “I don’t have a crew to harvest my grapes.”

Wineries need to receive fruit early in the day when fruit is still cool. You need to make sure you will deliver on time and that your equipment is working so that there will not be any unexpected hang ups.

Reason #3. “I don’t have a truck to deliver my grapes.”

Delivery costs are negotiable. For a small winery, a pick-up might suffice for delivery of your grapes. For larger deliveries, you may need to rent a truck. Make sure you prepare in advance for truck rentals so you have the size vehicle you need, when you need it.

Reason #2. “I have a little mildew, botrytis, in my grapes.”

It is imperative you practice good pest control to deliver the best crop possible. You need to communicate any problem you have during the season with your winery customer as soon as you note it so that you can arrive at a mutual solution to that problem. Don’t try to hide anything.

Reason #1. Poor Communication.

I (Ron) spoke with several wineries in preparing this talk to ask them what problems they have encountered in setting up grape deliveries. Answers I received included comments such as “growers didn’t let me know they couldn’t do the thinning we requested”, “growers did not do the leaf pulling we needed for the quality”, “the grower was late with a sulfur spray and thought we wouldn’t notice”, “there was a problem with getting a picking crew and the grower didn’t notify us”. Good communication between the grower and winery is critical. This is about relationship building and partnering with your winery customer. Often wineries can assist with such issues as finding a picking crew if they know with advance notice.

GOT GRAPE DAY?

Thursday, June 14 beginning at 8:15

Held at the Plymouth Fairgrounds-Spur building

- **Mealybug biology and control strategies**
Monica Cooper, Staff Research Associate, UC Berkeley
- **Field identification of mealybugs and how mealybugs move into vineyards**
Gillian Watson and Kris Godfrey, California Dept. of Food and Agriculture
- **Spread of Leafroll virus: Implications for growers**
Ed Weber, U.C. Cooperative Extension Farm Advisor, Napa County
- **Achieving vine balance and the role of rootstocks**
Jim Wolpert, U.C. Specialist, Dept. of Viticulture and Enology, UC Davis
- **Extended ripening effects of Cabernet Sauvignon**
Ed Weber
- **Evaluation of Sierra foothill Zinfandel selections**
Donna Hirschfelt, UC-Davis Extension

Registration is \$25 per person and includes a catered lunch from InCahoots and a complimentary glass of heritage Zinfandel.

**Register online at <http://ceeldorado.ucdavis.edu>
or contact Robin Cleveland at 530-621-5505**