



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
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Happy Holidays! Grape harvest this year was, according to many of you, somewhat "unusual", with
early frosts and cooler temperatures, drawn out harvests, and in some cases, smaller berries and
lighter yields. I have also heard forecasts for intense wines from this vintage, as time will tell. This
issue updates you on a few of the viticulture projects I have been working on recently, including the
recent Syrah Vine Health Symposium and an update on Gill's mealybug, an increasing pest problem
all growers should be aware of that is apparently unique to the foothills. I wish you all a wet
winter!

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SYRAH VINE HEALTH SYMPOSIUM BRINGS RESEARCHERS TO THE FOOTHILLS

Researchers from the University of California, USDA, South Africa and France shared information
on the current state of knowledge about the unique growth problems of Syrah during a three day
tour of California Syrah vineyards that culminated in the Syrah Vine Health Symposium meeting
held November 6 at UC Davis. Over 100 interested growers and vineyard managers attended the
Symposium which was organized by Rhonda Smith, UCCE Sonoma County Viticulture Farm
Advisor and Mark Battany, San Luis Obispo and Santa Barbara County Viticulture Farm Advisor,
and supported by grants from the American Vineyard Foundation and the California Competitive
Grant Program for Research in Viticulture and Enology. I had the pleasure to host Mark Battany
(UCCE Viticulture Farm Advisor) , Jerry Uyemoto (USDA virologist), Dariusz Goszczynski, (Plant
Protection Research Institute virologist, South Africa), and Anne-Sophie Renault-Spilmont
(ENTAV-ITV virologist, France) for a foothill Syrah vineyard tour and learned a lot about
diagnosing "red leaf" and decline in sick Syrah vines.

Syrah Decline is the name given to the disorder of Syrah grapes characterized by deep grooving
and pitting just above the graft union and sometimes up into the cordons, resulting in poor nutrient
translocation, early red leaves beginning in late summer, stunted cane growth and, in some cases,

death of the vine. The cause of Syrah Decline is not yet known, but this symposium brought an opportunity to hear opinions from experts around the globe. Some researchers believe Syrah Decline is caused by a yet unknown virus, others think it may be an abiotic disorder caused by herbicide injury to especially sensitive clones.

**What causes “Red Leaf”?** Although tourists and winery visitors may enjoy seeing red leaves on grapevines, red leaves are not considered normal and usually indicate something wrong with the vine. Several problems can cause “red leaf” symptoms in grapevines, and while red leaves are one symptom of Syrah Decline, it is not the only symptom; and certainly Syrah is not the only variety to show red leaves.

UCCE Farm Advisor **Mark Battany** did an excellent job of recapping the symptomology he has seen working with Syrah in San Luis Obispo and Santa Barbara Counties. He categorized red leaf symptoms into three groups:

**1. Red leaves with fruit that does not ripen: Leafroll virus disorder.**

There are at least eight known strains of leafroll-associated virus (GLRaV1-9). The main symptoms of leafroll virus infection are red leaves (typically with green veins) and fruit that do not ripen, so fruit quality is typically poor but the vines grow and survive. Although Mark tested vines for virus, some vines had typical leafroll symptoms but did not test virus positive. He believes this means that there is at least one other strain of leafroll virus that we can not yet detect. He also observed that increasing irrigation can sometimes suppress red color in leafroll vines but the fruit quality remains poor; and that fertilizing and crop load reduction typically does not reduce leafroll symptoms.

**2. Red leaves with fruit that ripens fine: Syrah Decline.**

Vine decline is less common than leafroll in the coastal counties. Vines with decline have deformed graft unions (or area above and surrounding the graft union), fissures on the trunk and sometimes cordons, red leaves but no bright green veins, and the vines die but the fruit quality remains good. Clone 877 especially has been observed to exhibit decline symptoms.

**3. Red leaves with marginal burn, or “potato chip”-like leaves: Leaf burn.**

Leaf burn has been observed in the hotter, drier areas of the central coast counties. Symptoms are leaves that typically burn up and fall off. Water stress and management are factors, and Mark noted that salt build up with practices such as gypsum application in low rainfall years can make the problem worse. Why is Syrah more sensitive? One possibility is that Syrah has a different response to drought conditions-the stomata of Syrah stay open-than a variety like Grenache which is believed to be more drought resistant.

**Other causes of red leaf: phosphorus deficiency, pest damage.**

Other causes of red leaves I have observed in the foothills include phosphorus deficiency (confirmed by tissue testing analysis) and pest damage caused either by voles (which girdle the trunk above the soil line) or Three Cornered Alfalfa Hopper (very common here-causing just one or a few leaves to turn red on the vine, you will see the leaf petiole is girdled by the hopper). Mechanical injury can also impair nutrient uptake and result in red leaves. It is important to look at the trunk when trying to determine what the cause of red leaves is in your vineyard.

**Syrah Decline in France.** There are more than 16,000 acres of Syrah planted in Southern France. The origin of Syrah is the Northern Rhone Valley, specifically thought to be the Côte Rôtie and Tain l'Hermitage appellations.

ENTAV Institute scientist **Anne-Sophie Renault-Spilmont** was hired by ENTAV specifically to work on Syrah decline, which was first observed in France in 1993. According to Anne-Sophie, symptoms observed in France include fall leaf reddening, swelling and cracking at the graft union with a declining scion but often the rootstock is still alive, pushing green growth. Sometimes cracking at the graft union is observed but the leaves of the scion will still be green. Symptoms appear on 4-5 year old vines and 6-10 year old vines.

**Rootstock and clone impact in France.** French studies indicate that certain rootstocks and clones have a greater incidence of expressing decline symptoms. 110R and 99R rootstocks have an increased sensitivity of showing decline, and these rootstocks are no longer recommended in France. The 16 certified ENTAV-INRA clones have been checked in France and are grouped into three categories based on likelihood of showing symptoms:

Showing few symptoms include clones: 470, 471, 524, 747

Showing moderate symptoms include clones: 100, 174, 300, 525, 585, 877

Showing severe symptoms include clones: 73, 99, 301, 381, 382, 383

»It should be noted that we do not yet have this information completely compiled for California conditions. During our vineyard tours, growers would often note that certain clones may do poorly on some rootstocks (3309C appears to be one that can often show decline expression) and fine on other rootstocks. Clones 877 and 174 often expressed decline symptoms, however, this was not consistent and there are a lot of factors, such as using certified scion wood and management practices that may contribute to a vine's expression of red leaf and its purported "decline".

**Role of pathogens.** The French have also conducted numerous studies to try to determine if any pathogens (bacteria, fungi, phytoplasmas, or virus) are present in symptomatic plants. Results thus far do not implicate any class of pathogens, since some can be found in both symptomatic and asymptomatic vines. Some researchers think decline could be caused by a yet unknown virus, so work in this area will continue.

In South Africa where Syrah (referred to there as Shiraz) is also widely grown, two diseases, Shiraz disease and Shiraz decline are recognized. **Dariusz Goszczyński**, a virologist at the Plant Protection Research Institute in Pretoria, South Africa has conducted a large study with symptom and symptomless vines and tested them for various viruses. During these tests he has found yet another virus, Apple Stem Pitting virus, in symptomatic vines and is investigating whether this virus is responsible for Shiraz decline in South Africa.

In California, I and other Farm Advisors have been making collections of decline symptomatic vines and delivering them to **Adib Rowhani**, UC Davis virologist. Adib has been testing all samples for Rupestris Stem Pitting (RSP) virus, including a strain of RSP isolated from Syrah. Results from these studies do not indicate the RSP or RSP Syrah strain is responsible for Syrah decline since it is found in symptom and symptomless vines, however, Adib's work will create a

large RNA library that can be used in the future to compare vines and may yet shed some light on the nature of this problem.

**A genetic component?** Anne-Sophie also reported that the French have conducted genetic analysis of the 16 ENTAV clones using different markers. For one of these markers, a high correlation was found with its presence and the occurrence of decline symptoms. The presence of this genetic marker is now being used by the French as a means to eliminate clones from their collection.

**Is there a herbicide connection?** USDA researcher **Kerri Steenwerth** presented work that she and **Jerry Uyemoto** have been doing to determine if herbicides may be damaging vine trunks and causing Syrah decline symptoms, especially for clones 877 and 174. Kerri and Jerry have planted and maintained a plot of these and other clones and varieties at UC Davis since 2005 and have applied treatments of Goal 2X (oxyfluorfen), Surflan (oryzalin) and RoundUp Ultramax (glyphosate), and combinations of these herbicides. So far, they have observed some decline symptoms on some of the treated Syrah plant and will continue their work to see if symptoms continue to be expressed with time.

Syrah decline is obviously a complex disorder that we are just beginning to understand. The complete symposium proceeding are now available online at: <http://groups.ucanr.org/Syrah/> or through a link on my website at: [http://ceeldorado.ucdavis.edu/Viticulture/Syrah\\_Vine\\_Health.htm](http://ceeldorado.ucdavis.edu/Viticulture/Syrah_Vine_Health.htm)



### **GILL'S MEALYBUG FOUND IN INCREASING NUMBER OF EL DORADO VINEYARDS**

Gill's mealybug, *Ferrisia gilli* (Gullan), has recently been found in an increasing number of vineyards in El Dorado County. Since late summer I have been working to identify vineyards that have the mealybug, to educate growers on mealybug identification and biology, and to organize a coordinated plan to manage the mealybug. In October I invited UC Berkeley researcher and mealybug expert Kent Daane and CDFA researcher Kris Godfrey to meet with growers and El Dorado Ag. Commissioner office staff to discuss the current situation and to give advice on next steps.

**What mealybug is this and why should grape growers care?** Mealybugs are tiny sap sucking insects that excrete a white woolly or "mealy" wax. Mealybugs are found under the bark, in trunk crevices, on leaves and will eventually get into the grape clusters. Their sap sucking means they secrete a sticky honeydew and often this is the first notable sign of mealybug presence. Although the honeydew and presence of the mealybugs is disagreeable they do not harm the quality of the wine; however, large populations can stress vines by feeding and mealybugs can spread disease such as leafroll virus which does impair grape ripening. Gill's mealybug is relatively large (although you still would probably need a hand lens to identify one) and it's secreted wax is very filamentous, giving it what I call a "fiberglass like" appearance, and making it easy to distinguish from other mealybugs like the Grape mealybug which is commonly found here.

The first record of Gill's mealybug in El Dorado County is from 2003. In 2004 it was found in a commercial vineyard. Although the El Dorado Agricultural Department has attempted eradication for the past several years the mealybug is apparently spreading. In 2007, there are at least 12 vineyards that have the mealybug present, or approximately 180 acres (if include entire vineyard

acreage where found), that we know of. I suspect that in 2008 there will be more vineyards with Gill's mealybug identified. It is difficult to map the spread since there is no pheromone lure and no trap for this mealybug.

Prior to finding Gill's mealybug in grapes in El Dorado County, it was discovered as a pest on pistachio in the Valley in the 1990's. There was confusion for some time with another mealybug, "Striped mealybug", *Ferrisia virgata*, which is mainly found on ornamentals. Gill's mealybug is the correct name for this insect.

It is unusual that Gill's mealybug is found on grapes here and we do not fully understand why. It could have something to do with our foothill climate although this is speculation at this point. The published known host list includes mostly woody shrubs and trees: *Prunus* species (almond, pistachio, nectarine), persimmon, myrtle bushes, flowering dogwoods and more. It has not yet been found on hosts other than grapes in El Dorado County.

Because Gill's mealybug is not commonly found in California it is deemed a "B" pest status by the CDFA which means the local management program is up to the County Ag. Commissioner. The presence of Gill's mealybug in fruit at harvest could be a shipping issue for growers. A certificate ("free from" determination) would be difficult for the county to issue. Growers should be up front with the wineries they are delivering to and wineries should always inquire with the growers as to their pest issues and management plans.

**How do mealybugs spread?** Mealybugs can be spread by people, equipment, wind, birds, and from winery pomace. Crews should be trained to change clothes and shower before moving from an infested site. We are fortunate that we do not do mechanical harvest here but mealybugs can be spread in bins. Crawlers especially can be picked up by the wind and it is quite likely that birds move mealybugs. Mealybugs do not survive the fermentation process, but can survive the pressing process and have been found alive in discarded pomace. Pomace should be properly composted or the grower should bring infested pomace back to the original vineyard.

**Next steps.** Three Gill's mealybug programs are planned for this spring: 1.) To understand the biology of this mealybug; 2.) to control the mealybug, which will be both an individual and group effort; and 3.) to educate growers and crews on identifying if the mealybug is present in vineyards. Although eradication of Gill's mealybug at this point is unlikely growers who find or think they might have Gill's mealybug in their vineyard should feel comfortable calling me for advice.

One very good thing is that I have found many, many mealybugs parasitized (by tiny wasps) and I believe we have a good potential to utilize natural biological control to manage this insect. Kent Daane, who is a biocontrol specialist, will be assisting with this aspect as well as setting up a program to better study the biology of Gill's mealybug.

There are many chemical options for mealybug control, including reduced risk and organically approved insecticides. For these materials to be most effective, the right stage of the mealybug (crawler stage) should be targeted. I will be working with growers this spring to better target mealybug insecticide applications.

- **Pictures of Gill's mealybug** and more information are available on my website at: <http://ceeldorado.ucdavis.edu>

Scroll down the main page and click on "Viticulture". I have been working to update my website pages, with help from my office assistant Robin Cleveland (thank you Robin!). There is a side bar for mealybug information with pictures and literature. **Also you can subscribe to this newsletter online at the website.**



**NEW PUBLICATION AVAILABLE IN SERIES TO HELP FARMERS MANAGE WATER QUALITY.**

**"Sediment Management Goals and Recommended Practices for Orchards and Vineyards"**, a new publication written by Mark Battany, UCCE Farm Advisor in San Luis Obispo County, is now available free online as part of the **UCANR Farm Water Quality Planning series** at [http://groups.ucanr.org/signup/Fact\\_Sheets/](http://groups.ucanr.org/signup/Fact_Sheets/).

The publication outlines eight management goals for reducing sediment runoff from vineyards and orchards and gives steps for practices to achieve these goals with reference to affiliated NRCS practices. The management goals include:

- Assess the existing soil conditions and rainfall runoff patterns.
- Develop an orchard or vineyard layout that minimizes erosion.
- Manage the orchard or vineyard floor to maintain protective vegetative cover during the rainy season.
- Coordinate efforts to control sources of runoff, sediment, and erosion with neighboring landowners.
- Manage roads and non-cropped areas to reduce runoff and prevent soil erosion.
- Retain eroded sediment and runoff before it leaves the orchard or vineyard.
- Prevent erosion that results from irrigation practices.
- Evaluate and maintain Management Goals and Recommended Practices.

The UCANR Farm Water Quality Planning website has a host of helpful publications to assist growers who are faced with increasing regulatory pressure to demonstrate water quality stewardship. The fact sheet publications available for free online at the website above include: Developing a Farm Map, Vegetative Filter Strips, Pesticide Selection to Reduce Impacts to Water Quality, Watershed Response to a Storm Event, Management Practices for Irrigation and Nutrients, and much more.



**SAVE THE DATE: MAY, 2008 VARIETY FOCUS: CABERNET SAUVIGNON, UCDAVIS EXTENSION**

The fourth in the popular variety series for wine grapes will focus on Cabernet Sauvignon, renowned for its use in red winemaking throughout the world. The one day lecture, to be held in Davis in May, will cover the origins of the variety, development and selection of clones, and feature guest growers and winemakers from France. You can sign up to be notified of these and other grape relevant meetings online at the UC Davis Extension site [http://extension.ucdavis.edu/unit/agriculture\\_and\\_food\\_science/](http://extension.ucdavis.edu/unit/agriculture_and_food_science/)

Click on Agriculture and scroll down to be notified when registration begins.