Oklahoma State University and Oklahoma Cooperative Extension Service

Le Vigneron

A newsletter for the grape growers and wine makers of Oklahoma

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Co-editors:

- Eric T. Stafne
- William McGlynn

Inside this issue:

Doom and Gloom? Nah, Just the Facts

Many times I have received the comment that our OSU grape management short course is the "doom and gloom" course because we spend so much time on things like insects, diseases, and cold damage. Well, if understanding those things was not integral to grape growing in Oklahoma then we wouldn't talk about them; however, one must understand pest management to succeed. In that vein, this issue contains an article that describes a new way to help with black rot spraying. Dr. Damon Smith and Al Sutherland, of the Oklahoma Mesonet, teamed up to create a black rot advisor. This could be an extremely useful tool to save growers money and headaches in deciding when to spray. On the other side of the "doom and gloom" we have a new addition to our team — Dr. Eric Rebek has taken over the grape entomology duties from Dr. Phil Mulder. Dr. Rebek has already been integrated into our short course and he has a graduate student working hard on Pierce's disease insect vectors. He should be a great asset to the program. All in all, the "doom and gloom" factor is really just the opposite — we are presenting the facts and arming you with the information you need to keep ahead of the problems. Grape growing in Oklahoma is not easy, but it is doable. If we are aware of our obstacles then we can prepare for them. If we ignore them, then we really are in for some "doom and gloom".

2010 OSU Grape Management Short Course Update

Eric T. Stafne

The 2010 OSU grape management short course has been going very well. In June, Gary and Marsha Butler made a guest appearance which generated a lot of questions. As always, I appreciate their efforts in coming to the class. In July we will be headed over to Woodland Park Winery and Vineyards in Stillwater. Ivol and Jeannette Hane will show off their winery and tasting room. August and September classes will cover topics such as harvest, trellis construction, soils, and winter preparation. September is the last class of the year, so if you plan to attend next year (or know someone who wants to) contact me in October and we will get you signed up.

The Technical Tipple

William G. McGlynn

The wine being examined in this edition of *Le Vigneron* is a sparkling wine from France. No, it's not Champagne. It is labeled as a *vin vivant*. Unlike champagne, which attains its sparkle via a secondary fermentation spurred by the addition of additional sugar (*dosage*), this wine is carbonated because the primary fermentation is halted before all of the original sugars have been fermented. This results in a light, fruity wine that is sweet and fairly low in alcohol content. The name for this style of winemaking is *methode ancestrale*, and although it's not commonly used today outside of a few areas in France, it actually predates the champagne process.

Although it is not identified on the label, this wine is likely made from a must that is at least 90% Mauzac grape. This white *vinifera* grape is not much grown outside of southwest France and is noted for possessing a strong fruity note, with flavors of apples and pears predominating. Traditionally, a *methode ancestrale* wine is bottled before fermentation is complete; the build-up of CO_2 in the wine halts fermentation. As the lees are not subsequently removed, these wines are typically slightly cloudy with noticeable sediment in the bottle. Some of these wines are now being made by allowing CO_2 saturation to halt fermentation in the tank, whereupon the wine is sterile-filtered and bottled. This results in a crystal-clear sparkling wine, but is typically done using specialized equipment that allows filtration and bottling under pressure. Either way, the wine is bottled in a champagne-style bottle.

On to the testing... Following are the objective test results we obtained:

<u>French Sparkling Wine</u>

pH (unheated sample): 2.95
pH (heated sample): 3.0

Titratable acidity (unheated sample): 8.2 g/L (0.94%) as tartaric
Titratable acidity (heated sample): 6.9 g/L (0.69%) as tartaric

Free SO_2: 10 ppm

Residual sugar: 9.4% (94 g/L)

Alcohol: 5.98% (Labeled as 6%)

We tested the pH and the titratable acidity on two samples: one was straight from the bottle and the other was heated to drive off the dissolved CO_2 present in the wine. This was done simply to demonstrate the effect of dissolved CO_2, which most wines right out of the bottle contain at some level, on pH and acidity measurements. In this case we can see that while heating the sample did not have a dramatic effect on pH, the effect on titratable acidity is notable.

Looking at the pH and acidity of the heated sample, we see that the pH was at the low end of the desirable range for a white wine (~3.0 – 3.4) while the titratable acidity was well within the desirable range for a white (~6 – 8 g/L). We would typically want a fairly acidic must for this style of winemaking in order to balance the high residual sugar content, which in this wine was 9.4%. For a comparison, that's about as sweet as fresh watermelon juice. The alcohol content was 5.98% as measured by distillation and refractive index. This matched the labeled value almost exactly.

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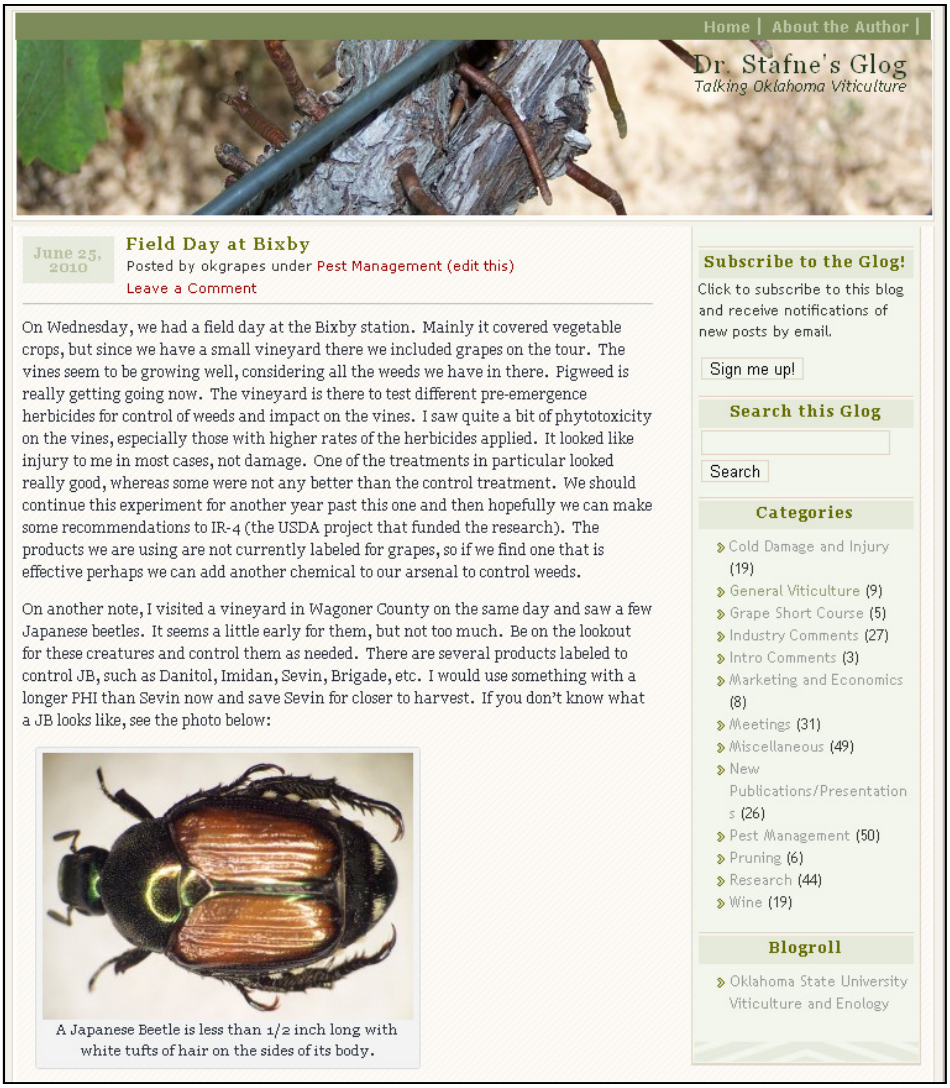
Glog Keeps on Rolling

Eric T. Stafne

As I mentioned in the last issue my blog is now available for all readers at http://okgrapes.wordpress.com/ or by going to our website at www.grapes.okstate.edu and clicking on Okstate Grape Blog (The Glog!) . I have formatted the front page so that it is easier to sign up to get email notification of new entries. Now on the front page there is a button that says, "Sign me up". So far I have 3 subscribers, but I'd like to have more than that. As of this writing, I have had 1,538 total views of the blog site. I don't really know if that is good or bad, but it seems decent to me — more than when I was doing the OGGWMA blog.



Finding the New Oklahoma Grape Handbook

Eric T. Stafne

If you don't want to order a handbook online, then you are in luck. The grant program that funded the writing and publishing of the handbook allowed me to print enough books for every county in Oklahoma to get one box (about 25 books) and have some left over. Right now the OSU county extension offices that have the books available are: Lincoln, Payne, Kingfisher, Logan, Garfield, Canadian, Cleveland, Rogers, Pawnee, Kay, Mayes, Johnston, Osage, Tulsa, and Hughes. I hope to reach many more counties over the coming months. As always you can order it online here (https://secure.touchnet.com/C20271_ustores/web/product_detail.jsp?PRODUCTID=776). We also still have pest pocket guides available.

Tipple, cont.

William G. McGlynn

The free SO_2 level was measured at 10 ppm. This translates to a molecular SO_2 concentration of about 0.59 mg/L (ppm) at a pH of 3.0, which is right at the standard baseline of 0.6 mg/L molecular SO_2 recommended to insure storage stability. Overall the fundamental chemistry of this wine was sound and exactly fits what we would expect with this style of winemaking.

The subjective impressions:

The wine was extremely clear, with a medium-light golden color. The legs were very faint – no surprise given the low alcohol content – but the wine still had noticeable viscosity to it, likely as a result of the relatively high sugar content.

The aroma of the wine was fairly mild, although the smell of carbonation was quite noticeable. Underneath the carbonation were aromas of apple, pear, and apricot, with hints of tropical fruit and a green vegetative aroma somewhat reminiscent of green hay. Overall the aroma was very pleasant and fruity, but not especially complex, especially at first whiff.

The wine was light and quite bubbly in the mouth. It was very sweet, but the sweetness was balanced by the acidity and the carbonation. Without the sparkle, the wine would have been cloying. But with it, the sweetness was pleasant. Flavors of apple and pear predominated, with perhaps a hint of citrus and herbs; not much complexity was apparent beyond that. This was not a subtle or difficult wine – far from it. But it was refreshing, light, and tasty. The finish was moderate. The sensations of fruit and sugars lingered on the tongue. But those sensations were not heavy in the way that some very sweet dessert wines can be.

The final verdict:

This wine could be used as a dessert wine, but it doesn't have the body to stand up to a very heavy dessert. It would be a wonderful accompaniment to something light and fruity such as a sorbet. It would also make a great sipping wine, perhaps with fruit and cheese. All in all, it's a wine that's tailor-made for hot summer days and it's a wine that should be very accessible to novice wine aficionados. Given that, perhaps *methode ancestrale* is a winemaking technique that Oklahoma wineries might want to explore. Perhaps a modest *reprise* for this traditional style of wine is in the offing.

The Technical Tippler's ranking of a French *Methode Ancestrale* Sparkling Wine: 9 out of 10 flasks.

The Technical Tippler welcomes suggestions for wines to evaluate and evaluations to conduct! Feel free to email suggestions to william.mcglynn@okstate.edu.

The New Agweather Black Rot Advisor and How to Use It

Damon Smith and Al Sutherland

In Oklahoma, black rot, caused by the fungus Guignardia bidwellii, is the most important foliar disease of grapes. Black rot will manifest on foliage (Fig. 1), followed by secondary infections of fruit (Fig. 2). Most loss is a result of direct destruction of the fruit by the fungus. Black rot can be managed using cultural practices and chemical control.

Fungicides used to treat black rot should be used preventatively when weather is predicted to be favorable for infection and subsequent disease development. In Oklahoma, preventative applications of fungicides should begin when shoots are 3-10 inches in length and continue at regular intervals when weather conditions are favorable for disease. The most critical time for application of fungicides is just prior to bloom until at least 4-to-6 weeks post-bloom. Once veraison is initiated, natural resistance in fruit exists and fungicides are not required.

Infections by the fungus are driven by leaf wetness duration periods, which vary depending on the average temperature (Table 1). Temperatures of 70˚F to 80˚F require the smallest duration of leaf wetness and are the most favorable temperatures for fungal infection. The new Agweather black rot advisor is based on the data in Table 1. The quadratic equation (Equation 1) on the next page is used to calculate the number of threshold wetness hours necessary for black rot development for each day. This equation was developed from -data in Table 1.

Figure 1. Symptoms of black rot on a grape leaf

Figure 2. Symptoms of black rot on a grape fruit cluster

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Black Rot Advisor, cont.

Damon Smith and Al Sutherland

Table 1. Hours of continuous leaf wetness required for an infection by *Guignardia bidwellii* at select temperatures.

Temperature (˚F)	Minimum hours of continuous leaf wetness
50	24
55	12
60	9
65	8
70	7
75	7
80	6
85	9
90	12

Spotts, R.A. 1977. Effect of leaf wetness duration and temperature on the infectivity of *Guignardia bidwellii* on grape leaves. Phytopathology 67:1378-1381

In order to use the black rot advisor, the number of threshold wetness hours has to be determined for the day using Equation 1. Then the number of actual leaf wetness hours has to be calculated. Normally this would be performed using a specialized leaf wetness sensor. However, these special sensors are complicated and not widely used. Therefore, leaf wetness is interpolated from relative humidity using a specific threshold. Based on previous research in Oklahoma, leaf wetness can be reasonably calculated using a relative humidity threshold of 85% or above. For each hour where the relative humidity is ≥ 85%, that hour is considered an hour of leaf wetness.

-Finally, once the observed number of "leaf wetness hours" has been determined for the day, this number is compared to the "threshold wetness hours" calculated in the equation above. If the number of "leaf wetness hours" is equal to or greater than the number of "threshold hours" then a black rot disease day has occurred.

Equation 1: Threshold Wetness Hours = $0.0926(AT^2) - 4.2817(AT) + 54.974$

Where:

AT= Average daily air temperature in Celsius at 1.5 meters (5ft).
A day is midnight to midnight Central Daylight Savings Time.

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Black Rot Advisor, cont.

Damon Smith and Al Sutherland

Required Grower Inputs for the Automated Advisory

While most of what is described above is rather simple mathematics, it is cumbersome to perform because of the multiple steps and considerations involved in the algorithm and the requirement for equipment that can measure temperature and relative humidity. To simplify the task and speed up the time it takes to receive a daily advisory, the automated version of the black rot advisor has been established on the Agweather Mesonet website at the following address: http://agweather.mesonet.org/index.php/advisors/grape_black_rot/black_rot_advisor. The Agweather black rot advisor operates using the same steps described above, however, it does all of the math and calculations automatically. The weather inputs are provided via the Oklahoma Mesonet weather station network and also through 3-day forecasts provided by the National Weather Service. Growers who use the black rot advisor have to make two decisions to use it effectively. First, the grower must know which Oklahoma Mesonet weather station is in closest proximity to their location. They must select this station location in order to receive an accurate recommendation by the automated advisor. Second, the grower should consider the fungicide protection interval (period of time after application that the fungicide protects the plant from fungal infection) that they would like to use. Typically, this interval is 7-14 days (see explanation below). If a "Spray Fungicide" warning is given, but the grapes are currently protected by fungicide (i.e. the fungicide protection interval has not lapsed) then the "Spray Fungicide" warning can be ignored. If the fungicide protection interval has lapsed and a "Spray Fungicide" warning is given, then the grower should apply a fungicide application as soon as possible. If the "leaf wetness hours" fall below the "threshold hours" then a disease day has not occurred and the black rot advisor gives a "No Fungicide Needed" warning. No action is needed by the grower in this instance, except to check back the next day and observe the new advisory for that day. Growers should note that to use fungicides most effectively, they should be applied prior to an infection event (i.e. preventatively). Therefore, growers should pay special attention to the 3-day forecasts. The forecasts will enable users to apply fungicide in anticipation of an upcoming infection event.

Critical Considerations by the User

During the bloom period, the fungicide protection period is considered to be no longer than 7 days, due to increased susceptibility of grape to black rot. Otherwise, the fungicide protection period is 14 days. The daily black rot "Threshold Hours" and "Leaf Wetness Hours" are based on a 24-hour day from midnight to midnight. Fungicide applications are most effective when applied prior to a "Spray Day" or within 24 hours from midnight on a "Spray Day". Fungicides will be less effective, yet still worth applying up to 48 hours from midnight on a "Spray Day."

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Managing Green June Beetle and Japanese Beetle in the Vineyard

Eric J. Rebek, State Extension Specialist for Horticultural Insects

Viticulturists in Oklahoma must deal with a number of foes each year but the most significant arthropod pest is arguably green June beetle. These large beetles feed in great numbers on berries, causing a direct loss in yield. Whereas green June beetle is a native insect of North America and found throughout Oklahoma, an exotic grape pest is gaining ground in our state. Japanese beetles have continued their invasion westward and currently can be found in ten, mostly eastern counties of the state. In areas where the two species overlap, significant losses in yield can occur. In fact, studies in eastern states have shown that Japanese beetles attacking berries can facilitate feeding by green June beetle, making this "one-two punch" a formidable combination to combat.

Adult green June beetles are large and robust, measuring from 3/4 to 1 inch long and about 1/2 inch wide (Fig. 1). The color varies from dull brown with irregular stripes of green to uniform velvet green, and the margins of the body vary from light brown to orange. The underside also varies from metallic green or yellow to metallic dark brown with a yellow green tint. Adult Japanese beetles are smaller and measure about 3/8 inch long and 1/4 inch wide (Fig. 2). The body is metallic green with bronze wing covers. A row of five white tufts of hair are found along each side of the body next to the outer edges of the wing covers and is a key diagnostic feature. Larvae are white grubs that live in the soil and feed on organic matter (green June beetle) or grass roots (Japanese beetle).

Both species have one-year life cycles. By late May, overwintering larvae pupate in the soil and adults begin emerging and taking flight in late June through early July. Upon mating, females deposit eggs in pastures or turfgrass. Eggs hatch 1 to 2 weeks later and larvae feed and develop on plant roots. Larvae are fully mature by late September and by October they dig deeper into the soil to overwinter.

Green June beetle and Japanese beetle feed during the day and aggregate in large numbers on grape clusters, feeding on ripe (or overripe) berries. Green June beetles damage berries by gouging with a horn-like process located on the front of the head, then feed on the flesh of the berry. However, Japanese beetles have sharper mouthparts and can chew directly into the fruit. Japanese beetles are attracted to fermentation odors given off by injured berries. In turn, their feeding activity enhances feeding by green June beetle in vineyards infested by both species.

Because they feed in large numbers, vineyards need to be treated with an approved contact insecticide when less than 1% of clusters are infested. Essentially, it is time to treat when adults are first observed in the vineyard, so start early! I recommend using carbaryl (Sevin) or fenpropathrin (Danitol) in rotation. Whereas Sevin can be applied up to 7 days before harvest, Danitol cannot be applied within 21 days of harvest. Danitol is also a restricted use insecticide and care must be taken to not contaminate standing water as this compound is toxic to fish and other aquatic organisms.

Cultural control practices also exist for effective management of green June beetle. First, organic matter such as compost, manure, and hay bales should be eliminated from the area since larvae feed in these amenities. This sanitation method may reduce but not eliminate the source of beetles since adults are strong fliers and can colonize a vineyard from large distances. Second, grape varieties that mature later in the season are less susceptible to green June beetle (and Japanese beetle) because adult populations generally peak in July. Finally, trapping adult beetles away from the vineyard can help reduce numbers occurring on vines. Unfortunately, commercially available Japanese beetle traps tend to attract more adults into the landscape so I do not recommend their use. Green June beetle traps are commercially available and the bait elicits a strong aggregation response, particularly when sugars in the berry are low. These traps should be placed around the perimeter of the vineyard and checked frequently for adults. Live adults can be collected from the traps and killed by dropping them in a solution of soapy water.

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Beetle Control, cont.

Figure 1. Adult green June beetles showing color variation.

Figure 2. Adult Japanese beetle. Photo credit: Clemson University, Bugwood.org

Cultivar Spotlight: Syrah (Shiraz)

Eric T. Stafne

Syrah is the result of a cross between Mondeuse Blanche and Dureza, two relatively unknown *Vitis vinifera* cultivars. Grown widely within the Rhône valley in France it is not known whether that is the area of origin for this cultivar. Although Syrah is the official name, it is also called Shiraz in Australia and the United States. Syrah often makes a dry, red table wine. It can be used as a varietal wine or in blends. One of the notable aroma characteristics of Syrah is black pepper, which can make for a bold, spicy, tannic wine. It is a wine that is best aged before consumption. In Oklahoma, Syrah is extremely vigorous, especially when put on a roostock. It can also produced prodigious amounts of fruit, but this may come as a detriment to final quality. Other issues with Syrah in our climate is susceptibility to disease and lack of cold hardiness. The 2007 spring freeze was especially hard on the Syrah at the Cimarron Valley Research Station in Perkins. Before the freeze we were harvesting the equivalent of nearly 8 tons per acre. Since the freeze we have been lucky to harvest 1 ton per acre. Several of the own-rooted vines were seriously damaged or died as well. From these observations, the relative lack of cold hardiness and excessive vigor of this cultivar limits its opportunity to be a good option for Oklahoma winegrape growers and should not be a first choice for anyone wishing to produce a red vinifera grape.

Viticulture & Enology
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We welcome feedback and suggestions. Any responses can be mailed or emailed to the addresses on the left. We will strive to provide useful, pertinent, and timely information.

Initially this newsletter will be published 4 times per year in January, April, July, and October. If warranted the timing can be amended to better serve the grape growers and wine makers of Oklahoma.

'Vigneron' is the French word for someone who grows grapes for use in wine making.

Black Rot Advisor, cont.

Other Products Available on the Agweather Black Rot Advisor

There are several other products available in tabs located along the top of the black rot advisor webpage. One tab includes a "statewide map" that is updated each day showing disease days throughout the state since March 15. Note that these are not all days that a grower should have sprayed, they are simply days when weather was conducive for an infection event. Infection events can occur during a fungicide protection interval. When this happens no action is necessary. However, it is critical that the grower keep good records of spray dates so they don't loose track of when the fungicide protection interval ends. The "Local Mesonet Site" tab has other products including a site-specific forecast black rot hours table and a season-long black rot hours table. Finally, the "Past Years" tab allows the user to compare the current number of "spray days" to "spray days" for that date in the four previous years.

Final Comments

The Mesonet Grape Black Rot Advisor is a weather-based tool that provides pest control guidance. It does not replace the best judgment of the grower in making pest management decisions. Also, growers should not forget about the presence of other pathogens in their vineyard. Chemical management for other diseases such as powdery and downy mildew must continue until harvest and may even require an application of fungicide post-harvest.