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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- William McGlynn

Inside this issue:

Summertime Dream

Growing up in Michigan, Gordon Lightfoot's songs were always on the radio. If you don't know, he is a Canadian folk singer probably most famous for his song, "The Wreck of the Edmund Fitzgerald". That is a heartbreaking song, but he also sang lighter fare — like "Summertime Dream". I think many of us enjoy these days of summer in the vineyard, the wind whistling through the leaves creating a kind of solace that is hard to find in this fast-paced world. Running a vineyard is hard work, but the rewards are tremendous and not just the wine! The entire developmental process of the vine, from budbreak through harvest is a nearly miraculous progression. I think we all romanticize grape growing from visits to the established wine regions of the world. It all looks so effortless. But, we know better. In this issue we cover a couple of those heartaches we are so often faced with — herbicide injury and black rot. Yet, we also cover the upside of grape growing — new rootstocks, grape education, and blackberry wine. We are also pleased to introduce a new logo for our program. At OSU we are working hard to write grants, do research, and deliver extension publications and programming that will enhance your experience as a viticulturist. This summer will also be the first time we will make wine at the FAPC. It is an exciting time for everyone in the state, as the grapes color and harvest nears. As Gordon Lightfoot sang all those many years ago, "It's time for a summertime dream".

2008 OSU Grape Management Short Course Update

Eric T. Stafne

The June class marked the introduction of the digital microscope for identification of insect and diseases. This instrument allows the educator to place a sample under the microscope viewing area and project the image onto a much larger screen such that the entire student population can view it easily. The microscope was purchased with grant funds that also have allowed us to begin an insect collection and to publish a pocket field guide of grape insects, diseases, and other disorders. This publication is forthcoming and should be available by the end of the summer. The July class will visit the Woodland Park Winery and Vineyard in Stillwater to tour the newly planted and established vineyards and the well-established winery operation.

Pesticides In European Wine

German Green Member of the European Parliament Hiltrud Breyer has called on European retailers to get rid of what she describes as “dangerous pesticides” found in wine, claiming that some of them are carcinogenic and genotoxic.

She said that countries such as Denmark, which has reduced pesticide use by half, and Switzerland, had shown what could be achieved in terms of reduction of harmful pesticides.

The survey by Pesticide Action Network (PAN) Europe, together with NGOs from Austria, France and Germany, looked at 40 bottles of wine and found that all conventional wine contained pesticides that have no maximum limits set for wine. On average, each wine contained four pesticides, but one wine contained ten. The analysis found 24 pesticides, and PAN claims that five are classified as carcinogenic, mutagenic, toxic to the reproductive system or endocrine disrupting by the European Union.

Pesticides of most concern to Breyer include pyrimethanil, a possible carcinogen found in 25 bottles. Cyprodinil and dimethomorph were found in 18 bottles, procymidone, claimed to be a carcinogen, a reproductive toxin and an endocrine disrupter, was found in 11 bottles.

The NGO tested six bottles of organic wine and found no detectable residues in five but a low concentration of pyrimethanil in one. (Pesticide & Toxic Chemical News, Vol.36, No 22, March 31, 2008) **Note:** Denmark had a use rate of over 12 lbs of active per acre.

University of California Releases Five New Grape Rootstocks

Eric T. Stafne

Five new grape rootstocks were released recently to combat nematode and phylloxera problems. The five rootstocks are listed below:

8909-05 — *Vitis rupestris* x *V. rotundifolia*. Broad resistance to different types of nematodes.

9363-16 — background includes *V. rufotomentos* , *V. champinii* (’Dog Ridge’), and *V. riparia*. Strong resistance to root-knot and dagger nematodes. Roots and grafts easily.

9365-43 — derived from *V. rufotomentosa*, *V. champinii* (‘Dog Ridge’), and possibly *V. monticola*. Resistant to citrus and lesion nematodes, but moderately susceptible to ring nematodes.

9365-85 — similar parentage to 9365-43. Displays very good resistance to root-knot and dagger nematodes, with good resistance to citrus and lesion nematodes. Susceptible to ring nematode.

9407-14 — parentage includes *V. champinii* (‘Ramsey’) and *V. berlandieri*. Excellent root-knot and dagger nematode resistance. Resistant to citrus and lesion nematodes. Somewhat tolerant of ring nematodes.

These rootstocks were released to the public on March 31, 2008. Although publicly released, they may not be commercially available for some time (this can range from months to years). These rootstocks have not been tested in Oklahoma. Even though nematodes can be an issue, we have yet to see serious problems arise in grape vineyards in Oklahoma. We will update you when more information is available.

Glyphosate Injury

Eric T. Stafne

Do you know what glyphosate (RoundUp) injury looks like? It looks somewhat similar to 2,4-D injury with misshapen leaves and discoloration. Glyphosate is a systemic, non-selective herbicide that can cause serious damage to vines, especially during and after bloom. Stunting of young vines is common. Incidental drift early in the season will not cause lasting damage, but bloom and later may have lasting effects.

Photo Courtesy of Andy Allen, University of Missouri — Columbia

New Logo for the OSU Viticulture and Enology Program

Eric T. Stafne

A new logo has been designed by Mandy Gross from the Robert M. Kerr Food and Agricultural Products Center on campus. The intent of the logo is to use in vineyards of cooperating growers. We currently have on-going research at several vineyards around the state. So, look for this logo as a sign of our research in the future.

Viticulture & Enology
OKLAHOMA STATE UNIVERSITY

Competitive Grant Awarded to OSU From NARBA

Eric T. Stafne

Earlier this year, I was awarded a grant from the North American Raspberry and Blackberry Association (NARBA) to initiate a blackberry trial at the Cimarron Valley Experiment Station at Perkins. The purpose of this study will be to conduct a cultivar trial, but also to determine which of those cultivars makes the best juice and wine for commercial production. Just like grapes, there are many different cultivars of blackberries. None of them have been tested extensively for wine quality. This new trial will consist of six cultivars (Apache, Chickasaw, Kiowa, Natchez, Ouachita, and Triple Crown). I believe that fruit wines can play an important role for Oklahoma wineries, especially in years when grape crops are poor. Fruits like blackberries are typically made in a sweet style wine, making them particularly attractive to consumers of sweet grape wines. Blackberries can also contribute different flavor components that add complexity to the final wine product. Also part of this grant are Dr. William McGlynn and Dr. Edralin Lucas. Dr. McGlynn will focus on the quality and wine aspects of the blackberries, whereas Dr. Lucas will test for antioxidants and potential anti-inflammatory properties of the fruit. Dr. John R. Clark from the University of Arkansas (and the breeder of 'Apache', 'Chickasaw', 'Kiowa', 'Natchez', and 'Ouachita') is also a collaborator.

Viticulture Education Program for Grape Growers Administered by OSU

Eric T. Stafne

Viticulture Education Program

The program is a cooperative effort among Oklahoma State University – Stillwater (OSU-S), Oklahoma State University – Oklahoma City (OSU-OKC), Tulsa Community College (TCC), and the Oklahoma Grape Growers and Winemakers Association (OGGWMA). It is administered by OSU-S.

This is a two-tier professional education program. The Basic level provides college training in the fundamentals of horticultural science, plus applied training in viticulture and related techniques through OSU Cooperative Extension. The Advanced level provides further college training in horticultural science and related disciplines, plus further applied training through OSU Cooperative Extension. There is a five-year total time limit to complete the program. The Basic level would need to be completed in two years, and the Advanced level would need to be completed no more than three years after completing the Basic level.

The list of approved courses and workshops may change over time. Participants should obtain approval from OSU-S prior to enrollment in courses or workshops other than those specifically listed. Knowledge testing will be required at completion of short courses and Extension workshops. A grade of "C" or better will be required in all college-level courses. Participants who anticipate matriculating towards a college degree in horticulture at OSU-S, OSU-OKC, or TCC should contact an academic advisor at the appropriate institution for guidance in college course selection. Those intending to eventually pursue at B.S. in horticulture should contact Dr. Brian Kahn, Department Undergraduate Advising Coordinator at OSU-S.

OSU-S will collect a one-time program registration fee of $25. Any additional fees for courses, workshops, conferences, pesticide applicator testing, etc. will be paid directly by program participants to the appropriate entities. Participants are responsible for documenting attendance at events, and agree to provide transcripts for purposes of verifying satisfactory completion of required college courses. Participants completing each level of the Viticulture Education Program will be duly recognized with a framed certificate at the annual conference of the OGGWMA.

For more information, or to register for the program, participants may contact me, visit the website (http://www.hortla.okstate.edu/grapes/viticulture_education_program.html) or write to:

Viticulture Education Program

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Disease Profile: Black Rot of Grapes

Damon L. Smith

In Oklahoma, black rot, caused by the fungus *Guignardia bidwellii*, is the most important foliar disease of grapes. Black rot can be managed using cultural practices and chemical control. However, last season's abnormally large amount of rainfall and mild temperatures made for a challenging season for managing pathogens in the vineyard. This included black rot. Many growers found it difficult to get into the field to make fungicide applications, or they found that their "resistant" variety wasn't so resistant when the weather was continuously favorable for disease development. As a result, a significant level of disease was present in many vineyards. This has implications for this season too. All of last year's disease has resulted in the production of large quantities of primary inoculum available for production of new infections this season.

Signs, Symptoms, and Disease Cycle

Black rot will manifest on leaves (Fig. 1), petioles (Fig. 2), and canes initially, followed by secondary infections of fruit (Fig. 3). Primary infections result from spores that are liberated after rain events from fungal structures found on old plant debris and mummies (old shriveled berries) located in the plant canopy or on the ground. Infections of leaves result in the formation of lesions that give rise to new structures that generate more spores. The new spores can infect new leaves and fruit. Hence, the disease is considered polycyclic (having more than one cycle) due to the fact that several generations of infective spores can be generated in a single year. Most loss is a result of direct destruction of the fruit by the fungus.

Management of Black Rot

Genetic resistance is the easiest and most economical method of management for this disease. Most *Vitis vinifera* grapes are highly susceptible to *G. bidwellii,* while many French-American hybrids and American varieties have improved resistance to the fungus that causes black rot. Fungicides are available for managing the disease. Fungicides should be used preventatively when weather is predicted to be favorable for infection and disease development. Infections by the fungus are driven by a combination of continuous leaf wetness and specific temperatures (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. In Oklahoma, preventative applications of fungicides should begin when shoots are 3-10 inches in length and continue at regular intervals (Table 2). 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 the fruit exists and fungicides are not required. Growers should not forget about the presence of other pathogens in their vineyard however. Chemical management of powdery mildew must continue until harvest and may even require an application of fungicide post-harvest. Spray intervals should also be shortened if extended periods of wet weather are forecasted. Fungal resistance to fungicides should also be considered. Fungicides should be rotated frequently to minimize the occurrence of fungicide resistant populations of pathogens in the vineyard. In addition to chemical management, growers should use good cultural practices in their vineyards to prevent black rot. Proper canopy management and sanitation, including removal of mummies from the canopy and cultivation or burial of debris can help limit damage caused by the black rot fungus.

-continued on pages 6, 7, and 10-

Table 1. Hours of continuous leaf wetness required for an infection by the fungus that causes black rot 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

Table 2. A potential fungicide program for growers in Oklahoma concerned about black rot management, in addition to other select grape diseases.

Plant growth stage	Fungicide (active ingredient)	Labeled rates/acre	Spray interval (days)
3-10 inch shoots	Dithane DF Rainshield (mancozeb) +	3-4lb. +	10-14
	Quintec (quinoxyfen)[1]	3-4 fl. oz.	
Immediate pre-bloom/Early bloom	Nova 40WP (myclobutanil)[2]	3-5 oz.	7-10
Late Bloom	Elite 45DF (tebuconazole)[2]	4 oz.	7-10
Post Bloom	Abound (azoxystrobin)[2,3]	11-15.4 fl. oz.	10-14
First Cover	Elite 45DF (tebuconazole)[2]	4 oz.	7-10
Second Cover	Pristine (pyraclostrobin+boscalid)[2,3]	6-10.5 oz.	10-14

[1]Quintec should be tank mixed with Dithane for early season powdery mildew control
[2]These products also control powdery mildew
[3]DO NOT apply more than two consecutive sprays of strobilurin fungicides (MOA Class 11) and apply no more than 4 per season

Additional Notes:

Black rot focused control can end once fruit becomes resistant (fruit resistant 4-5 weeks after cap fall), however, MAINTAIN POWDERY MILDEW CONTROL UNTIL HARVEST

Pre-Harvest/Harvest: Some years Botrytis and other bunch rots will be a concern. Elevate 50 WG (fenheximide; pre-harvest interval (PHI) = 0 days; also can suppress powdery mildew) may be helpful in these situations. Growers could also use Pristine (PHI = 14 days) during this period if they have not made too many applications, or too many consecutive applications of strobilurin fungicides.

If downy mildew is a problem, Ridomil Gold (mefenoxam; PHI = 42 days) is an effective product; Abound is also effective, but fungicide resistance is a risk.

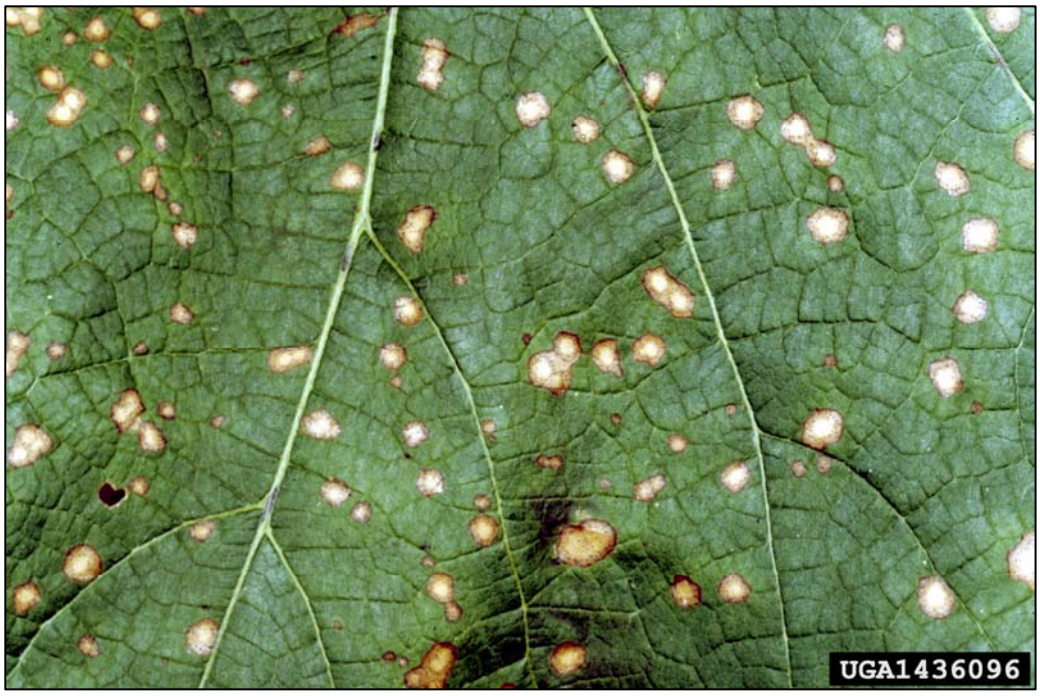

Figure 1. Leaf spot symptoms caused by the black rot fungus (Photo provided by Clemson University, USDA Slide Collection; bugwood.org).

Figure 2. Petiole lesion symptoms of black rot, with fruiting bodies of the black rot fungus in the lesion middles (Photo provided by Clemson University, USDA Slide Collection; bugwood.org).

Weather Info Honed to Perfection

Albert Sutherland, CPH, CCA

A highly honed, perfectly sharp Web weather tool is available to Oklahoma grape growers. This tool is designed to slice through Internet clutter to open up a wealth of weather information. It is available online. FREE to all Internet users. It will let you check weather statewide or focus in on local weather details. You can look at today's weather, check out tomorrow's forecast or get a glimpse of what we experienced in the past. It combines weather data from the Oklahoma Mesonet, Oklahoma Climatological Survey and the National Weather Service.

With a perfect edge, this weather tool for grape growers is the latest version of the Oklahoma Agweather Web site at ***http://agweather.mesonet.org***.

How has Agweather been sharpened?

The Mesonet site selected in "Current Weather at:" on the home page, sets the Mesonet site default for Agweather products.

"Current Weather" data is updated every 5 minutes.

Weather data are divided into five main tabs to speed data access.

An orange secondary menu is your introduction to the Agweather Web site.

The "News" section provides important Agweather news.

An Agweather Connection archive and sign up is available.

There is one click access to National Weather Service (NWS) 7-day detailed forecast and Hour-by-Hour forecast graphs.

NWS Regional Outlook takes you directly to the Norman NWS Forecast Office "Enhanced Web Page."

The "Forecast Table" has hour-by-hour NWS 84-hour forecast data for each Mesonet site location.

New links to "Drought" and "Aviation" forecast pages.

New link to the NWS Climate Prediction Center product page.

New link to NWS Oklahoma county "Watches and Warnings."

Regional and national zoomable radar and movies offer more storm tracking options.

One hour and three hour radar movie choices.

Regional satellite and satellite loops available.

New "Winter Storm" map with air temperature, wind and radar; when you need to know where rain changes over to ice.

Easy WeatherScope plugin download page.

New WeatherScope download and use instruction sheets.

Better menu navigation with new sub-groups.

WeatherScope maps and graphs make weather data easier to read and interpret.

A new monthly rainfall table shows rainfall for all months a Mesonet site has been in operation, most back to January 1994.

Color-filled weather graphs can show 6, 12, 24, 48, 72, 96 or 120-hour charts.

Hourly weather tables can be generated for the past 6, 12, 24, 48, 72, 96 or 120 hours for every Mesonet site.

Customized daily data can be requested and sent to your email address for spreadsheet use.

Links to national drought products.

A link to the new NWS Radar Precipitation Analysis page shows rainfall between Mesonet rain gauges.

New link to detailed and one-page county climate reports.

New link to US climate maps.

Horticulture, crop and livestock products grouped by management use.

We didn't count them up, but you get the idea. The newest Agweather Web site makes quick work of cutting through the layers that have kept you from making the most of Oklahoma's treasure of weather information.

Setting "Current Weather" and Forecasts

The "Current Weather at:" section on the home page (located in the upper right) offers you a way to customize your weather data. When you select the Mesonet tower location closest to you, you set the Mesonet tower default used throughout the Agweather Web site. This holds true even when the Web browser is closed and the computer is turned off or restarted. This new Mesonet tower default means less clicking and faster data viewing.

The tabs for weather data have been expanded to five on the new Agweather Web site. With more weather tabs and a default Mesonet tower, you can now access a detailed 7-day forecast with one click from any page. The hour-by-hour forecast graph jumps on screen after only two mouse clicks, no scrolling and tedious lists to sort through.

The hour-by-hour forecast graph is one of the most useful forecast tools available to grape growers. This National Weather Service forecast product goes beyond the forecast highs and lows to show how quickly or slowly weather conditions will change. It does this in an easy to read hour-by-hour time series graphs.

Grape Weather Tools

To access the "Grape" section, click the "Horticulture" main menu tab. Then, click on "Grape," the fourth menu item.

A detailed menu list will open with submenus organized by crop management. You have access to weather data, an irrigation planner, pest resources, USDA market reports and professional resources.

Here's an in depth look at one of the grape weather tools, the "Irrigation Planner."

On the farm energy and water are closely tied together. It takes energy to deliver the water grape plants need to produce a quality crop. The "Irrigation Planner" (formerly Evapotranspiration Model) can help you monitor grape water use on a daily or season-long basis. This can help you plan when and how much water is needed for good grape yield and quality.

The Mesonet tower location in the "Irrigation Planner" will default to the Mesonet site selected on the Agweather home page. If you want to select a different site, click on the map or open the text pull down menu. Then, select the start date for the time period you want grape water use information on. If you select a past year, the table will end at December 31 of that year.

What information is in each of the Irrigation Planner table columns?

The first column is the 4-letter Mesonet station code. The second column is the date. Dates run backwards, so that you can go down the table to the last irrigation date or major rain event and move over in that row to see the accumulated water use. The "red" column shows the daily grape water use in inches of water, labeled as "Evapotranspiration." The next column, labeled "Accumulated Evapotranspiration," shows the sum of all daily water use from yesterday back to the date in the row you are looking at. The "blue" column shows the daily rainfall amounts and the next column a sum of that rainfall, going back in time. The last column values are the "Accumulated Rainfall" minus "Accumulated Evapotranspiration." When the numbers are red, grape plants are using more water than supplied by rainfall. When the numbers are blue, more rain has fallen than the grape plants have used.

What is the negative "Water Balance" value that would cause you to irrigate?

The exact value is going to depend on your soil type, grape variety and vine management. Most Oklahoma soils will hold from 1.5 to 2.0 inches of water per foot of soil. Assuming your irrigation system can adequately wet the top 2 feet of soil, there might be 3 to 4 inches of water available. Grapes are typically watered when 50% of the available water is still in the soil. That would mean irrigating when the Irrigation Planner **Water Balance** is between **-1.5 for lower water holding soils**, sandy or heavier clay. Irrigation would be started when the water balance is **-2.0 with loam type soils,** that hold more available water. Adjust these values based on your own experience and grape vine response. You will also want to compare the rainfall at your vineyard with that recorded at the Mesonet site. Adjust the rainfall up or down based on the rainfall you collected.

Irrigate with enough water to replace the inches of water lost in the "Water Balance" column.

That's a detailed look at one grape weather tool. Take some time to check out the rest of the grape weather products and links. You'll find the Oklahoma Agweather Web site to be a valuable management tool.

The Oklahoma Mesonet is a joint project of Oklahoma State University and the University of Oklahoma.

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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 continued

Figure 3. Shriveled grapes as a result of infection by the fungus that causes black rot (Photo provided by Clemson University, USDA Slide Collection; bugwood.org).