

# Le Vigneron

*A newsletter for the grape growers and wine makers of Oklahoma*

Volume 6, issue 2

April-June 2011

**Editor:**

- Eric T. Stafne



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## ...And I Feel Fine

If you are an REM fan or just a fan of popular music from the 1980s then you know this line starts with, “It’s the end of the world as we know it..”. Of course it is not. The cold we experience in February may have disrupted our grape production in some locations this year but we will make it through. In this issue of Le Vigneron we will discuss the cold damage event, what happened to the vines at Perkins and around the state, and what to do about it. Dr. Eric Rebek has also supplied a timely article on Grape Berry Moth, including its biology and methods of controlling this potentially devastating insect pest. Also in this issue is an article on eViticulture, a national viticulture website recently launched at the Unified Wine and Grape Symposium that harnessing the collective knowledge of numerous grape extension specialists from around the country. This project is the realization of a USDA-NIFA-SCRI grant that was written two years ago. In those two short years we have gone from a germ of an idea to reality. Nearly 30 states are involved with over 60 members from California to Florida to New York. The project is headed up right here at Oklahoma State University by Dr. Eric T. Stafne. Finally, check out the Wine Forum of Oklahoma that is coming to the OSU campus on April 8 and 9. Six Oklahoma wineries will represent our state there. So even though things with the vines are not ideal, the season keeps rolling along. As the season progresses I will report how the vines are doing at Perkins, OKC, and Bixby. You will see in this issue, there is some concern, but overall I feel fine and I hope you do too.

## 2011 OSU Grape Management Short Course Update

**Eric T. Stafne**

The OSU GMSC started a little earlier than usual this year. We had the first class in the last week of February. About 25 hardy souls braved the weather to sit in on lectures regarding site selection, pesticide regulations, pruning, and cold damage. We even cut open buds to show the cold damage to the different buds on vinifera and hybrid grapes. The next class will be focused on economics and budgeting as well as insects, diseases, and ways to get the vine in shape following the cold damage. It should be a good experience — the first time we have had this type of cold to content with!

## eViticulture.org is Now Live

**Eric T. Stafne**

The national online resource, eViticulture ([eviticulture.org](http://eviticulture.org)), offers the latest in science-based information for viticulturists. This new resource, created by the Grape Community of Practice (GCoP) and eXtension ([extension.org/grapes](http://extension.org/grapes)), is directed toward commercial viticulturists who need proven, tested information to improve their skills in the vineyard.

“This community of practice is made up of a nationwide group of professionals with experience in grape production,” said Eric Stafne, Oklahoma State University Cooperative Extension viticulture specialist. “All the states involved have a grape industry, from the very large to very small, and all have an increasing interest in grape production.”

Expertise within the GCoP includes integrated pest management, plant pathology, food science, distance education, variety selection, canopy management and rootstocks, to name a few. Stafne said often individuals possess more than one expertise area, and expertise areas overlap, allowing for overall strength in numerous knowledge areas. The mission of the GCoP is to meet the educational needs of the grape industry as a whole; including industry partners, Extension employees and consumers by providing science-based information and learning opportunities through eXtension. Tools for eViticulture include more than 200 feature articles from basic concepts of viticulture to the latest, ground-breaking research, written in understandable language in both English and Spanish; ask an expert by submitting a specific question related to viticulture; and future content including webinars, videos, online courses and smart phone applications.

“Any professional, hobbyist or consumer in the field of viticulture will be able to access information about any aspect of growing and producing grapes,” Stafne said. “By doing so, this will increase their knowledge and help them use the information as a way to improve their skills, life and business. This project endeavors to not duplicate information in other university websites, but work synergistically with them to provide an easier, and more comprehensive, experience for the grower. Our end goal is to be the ‘one-stop-shop’ for viticulture information.”

## Wine Forum of Oklahoma 2011

**Eric T. Stafne**

The 2011 Wine Forum of Oklahoma takes place April 8 and 9 on the campus of Oklahoma State University. This year 6 Oklahoma wineries will be represented at my seminar: Woodland Park, StableRidge, Stone Bluff, Canadian River, Woods and Waters, and Plymouth Valley. My presentation will focus on one wine from each of the wineries and discussion on strengths/weaknesses and the interaction of genetics with environment (see description below). The entire session is from 9am to 11am on April 8 at the Alumni Center. You can find out more information on the Wine Forum, plus how to get tickets for all the events at this link:

<http://ches.okstate.edu/wineforum/2011/>

**Seminar: A Taste of Oklahoma Terroir: The Interplay of Variety and Environment** - Open to Public (StableRidge Winery, Woodland Park Vineyards and Winery, Woods & Waters Winery and Vineyard, Stone Bluff Cellars, Plymouth Valley Winery, and Canadian River Winery).

Oklahoma is a challenging place to produce high quality grapes, but one must start with high quality grapes in order to produce great wine. Environment and genetic predisposition of the vine interact in a myriad of ways which Dr. Eric Stafne will discuss using variety specific examples. Following the discussion will be a tasting of Oklahoma wines made from Oklahoma grapes and a chance to interact with the winemakers.

StableRidge will be presenting a Viognier. Woodland Park has a Vignoles. Woods & Waters will have Syrah. Stone Bluff has Cynthiana. Plymouth Valley will present a Cabernet Sauvignon. Canadian River TBA. These grapes are a good representation of what is grown in Oklahoma at the moment.

# Biology and Management of Grape Berry Moth

Eric Rebek, Extension Entomologist, Oklahoma State University

Grape berry moth (GBM), *Endopiza viteana*, is one of the most devastating grape pests from the eastern U.S. and west to the Rocky Mountains. This native caterpillar pest co-evolved with wild grapes in eastern North America and feeds exclusively on wild and cultivated grapes. Larvae cause extensive damage by feeding on flowers and fruit clusters, and damaged berries are associated with infections of sour rot and bunch rot. What follows is a brief description of this pest, its biology and life cycle, feeding damage it causes, and best management strategies for Oklahoma.

## Description

Adult moths are small with a wingspan of about 3/8 inch. The front wings are brown with a slight purplish sheen. The head is brown, and the center portion of the forewings may appear to have a dark saddle-like band running across them. Young larvae are either yellowish green or dull white with a black head capsule. The coloration of mature larvae ranges from olive green to brown. They measure about 3/8 inch long when fully grown. When disturbed, caterpillars wiggle and squirm vigorously and will drop to the ground to escape.

## Life Cycle

Grape berry moths overwinter as pupae in a cocoon. Larvae form the cocoon by cutting out a small piece of leaf tissue and folding it over to form a cavity, lining it with silk. Cocoons may remain attached to grape leaves or break off and fall to the ground. Some of the overwintering pupae are killed when temperatures drop below 10° F. Typically, adults emerge in late spring, coinciding with flower bloom (April). However, already I have received reports of adults flying in Cleveland County, so this year we are off to an early start—likely due to the above average temperatures we've experienced periodically so far this spring. Females deposit flattened, circular, cream-colored eggs on the fruit, stems, flower clusters, or newly formed grape berries. First-generation larvae feed on flowers or very young fruit clusters. This early activity is relatively unimportant in most vineyards. Later generations feed on developing or ripening grapes, often webbing several fruits together and tunneling inside berries. Each larva may destroy three or four fruits. It takes GBM an average of five weeks to develop from egg to adult. There are as many as three generations per year in Oklahoma.

## Hosts

Grape berry moth caterpillars feed exclusively on cultivated and wild grapes and prefer tender-skinned varieties with tight fruit clusters.

## Damage

Damage is caused by the larvae feeding in flowers and fruit. Once damaged, small fruits turn dark purple and drop from the stems. Larger fruits are usually webbed into the cluster and shrivel or rot in place. Larvae will tunnel into the berries and feed on the fruit internally. Damaged berries are susceptible to sour rot and bunch rot.

-continued Page 4-

# GBM, cont.

Eric Rebek

## Monitoring

A monitoring program for adults should be implemented in vineyards with a history of GBM or those located adjacent to woodland. Pheromone traps are used commonly to monitor adult moth activity. Pheromone traps consist of sticky traps containing female sex pheromones (attractants), which capture adult males. Control strategies need to be considered once adults are caught in traps. In Oklahoma, place three traps at the edge of woods adjacent to the vineyard on March 15. If the vineyard is not located near forested habitat, place the traps around the perimeter of the vineyard. Traps should be checked weekly for adult moths. In mid-May, move traps to the center of the vineyard and place on the top wire to monitor second- and third-generation moths. Monitoring becomes more important at this time because damage sustained by second- and third-generation caterpillars is most severe. Check for larvae or webbing on fifty clusters along the edge of the vineyard and another fifty clusters in the 10<sup>th</sup> row in to the vineyard. Insecticides should be applied if >1% of sampled clusters are infested.

Effective monitoring also includes knowledge of when GBM are present at key stages of development. This is done by logging accumulated degree days beginning January 1. The degree day model for GBM uses a development threshold of 50° F (DD<sub>50</sub>), which is the minimum temperature required for this species to develop. Use the following equation to calculate DD<sub>50</sub> for GBM:

$$DD_{50} = (\text{maximum temp.} + \text{minimum temp.}) / 2 - \text{threshold temp.}$$

For example, if the maximum temperature on a given day was 86° F and the minimum temperature was 46° F, the average temperature would be 65.5° F. Subtracting the threshold temperature of 50° F from the average temperature results in 15.5 degree days. Results of zero or less are recorded as 0 degree days. Remember, the daily degree day values are summed over time beginning January 1 to generate accumulated degree days. While simple and somewhat crude, this model is sufficient for monitoring GBM development and timing management strategies. The table below summarizes development of GBM and any necessary management actions *when GBM is detected during monitoring efforts*.

Accumulated DD <sub>50</sub>	GBM Development / Management Actions
300 – 600	Insecticides applied to vineyard perimeter vines, especially for vineyards located adjacent to woodland (see below for details)
~ 400	1 <sup>st</sup> generation larvae feeding on buds or wild hosts in adjacent woodland
1200+	Later generations of larvae present; check for larvae or webbing on 50 clusters along edge and 50 clusters in 10 <sup>th</sup> row in to vineyard; insecticides applied if >1% of clusters infested (see below for details)

## Control

Several non-chemical control strategies exist for GBM. Partial control may be accomplished through proper sanitation—thoroughly cleaning up around the vineyard and raking and burning fallen leaves during the fall or winter. Soil spreading or light plowing to a depth of one or two inches in the spring will cover some cocoons, preventing emergence of adults produced from those cocoons. Light infestations can be controlled by hand-picking infested berries.

Mating disruption is a somewhat novel, non-chemical control strategy that has been used successfully for large vineyards (i.e., ≥ 5 acres) in Arkansas. This strategy employs pheromone-laced ropes placed in high-risk vineyards at a rate of 200-400 ropes/A. The vineyard is thus saturated with GBM sex pheromone, which confuses males and makes it difficult for them to locate mates. This results in a large proportion of unmated females, which deposit unfertile eggs that never hatch. However, most vineyards in Oklahoma are not large enough to employ this strategy effectively.

## GBM, cont.

### Eric Rebek

Control with insecticides should accompany GBM detection following a monitoring program. If adults are caught in pheromone traps, begin spraying the perimeter vines between 300 and 600 degree days, which targets any larvae emerging from eggs deposited by females that move in from adjacent wooded habitats. Perimeter sprays should be made twice, spaced 10 days apart. However, the most important applications are made later in the season to target second- and third-generation larvae, which are the most damaging. If >1% of inspected clusters are infested, apply insecticides to the entire vineyard between 1200 and 1600 DD (2<sup>nd</sup> generation) and between 2400 and 2700 DD (3<sup>rd</sup> generation).

Conventional insecticides used for GBM control include phosmet (Imidan) and carbaryl (Sevin). However, these are broad-spectrum compounds that can harm more than just the target pest so consider using reduced risk chemistries that are safer for the applicator and the environment. Additionally, Imidan has a re-entry interval of 14 days so use of this insecticide is not very practical for most grape growers. Reduce risk options include *Bacillus thuringiensis* subsp. *kurstaki*, B.t. (Dipel), spinosad (SpinTor), and methoxyfenozide (Intrepid), an insect growth regulator (IGR). Products containing B.t. are highly specific to caterpillar pests, so there are no harmful non-target effects. Like B.t., spinosad is a microbial product that must be ingested by the target pest to be effective. Methoxyfenozide is an IGR that disrupts the molting process in immature larvae. The following table lists recommended insecticides and application rates for GBM control in Oklahoma.

Product	Active Ingredient	Application Rate	Notes
Imidan 70W	Phosmet	1.3 to 2.1 lbs/A	Reentry interval (REI) = 14 days
Sevin 80 WSP	Carbaryl	2.5 lbs/A	Do not concentrate spray on bunch
Dipel DF	B.t. subsp. <i>kurstaki</i>	0.5 to 1.0 lbs/A	These reduced risk products work best on small larvae
SpinTor 2SC	Spinosad	4 to 8 fl oz/A	
Intrepid 2F	Methoxyfenozide	8 to 16 fl oz/A	

### References:

Oklahoma Cooperative Extension Service. 2008. Major Horticultural and Household Insects of Oklahoma, OCES Circular E-918.

Texas Winegrape Network. 2007. Grape Berry Moth. Texas AgriLife Extension, <http://winegrapes.tamu.edu/grow/berrymoth.html>.

Oklahoma Cooperative Extension Service. 2011. OSU Extension Agents Handbook of Insect, Plant Disease and Weed Control, OCES Circular E-832.

## GBM Images



Grape berry moth adult – Oklahoma State University, [www.ento.okstate.edu](http://www.ento.okstate.edu) (left)

Grape berry moth larva and damage - Texas Winegrape Network, Texas AgriLife Extension, <http://winegrapes.tamu.edu/grow/berrymoth.html> (below)



Damaged berry - Texas Winegrape Network, Texas AgriLife Extension, <http://winegrapes.tamu.edu/grow/berrymoth.html> (right)

## Bud Damage from 2011 Winter Cold

**Eric T. Stafne**

The damage to vines from the extreme cold temperatures we observed around the state (-19 F Stillwater, -13 F Perkins, -15 F Chandler, -10 F El Reno, -31 F Nowata(!), was substantial. We need more warm temperatures to make the vine manifest the full damage symptoms. One saving grace is the snow that acted as an insulator, so if vines were damaged or killed above the snowline, then below that they may be o.k. This is how many vines survive in the more northern regions of the country.

But, what do we know, research-wise, about cold hardiness? Not enough, but studies by Dr. Tony Wolf in Virginia have shown hardiness of vinifera vines to be about -8 F. That, of course, is dependent upon the cultivar, the health of the vine, the time of the year, the weather preceding the cold event, etc. Is something like Syrah going to be cold hardy to -8 F? I don't believe so. Cabernet Franc? Probably. How about -19 F?

Good luck with that.

This is certainly a real "test" winter so far.

After looking at a lot of dead buds, we finally found a cultivar that seems to have withstood the -13.5 F with aplomb — Frontenac gris. This cultivar is from a single bud mutation of Frontenac. You can read more about it here (<http://www.grapes.umn.edu/gris/index.html>). The primary bud examinations were from Dr. Damon Smith's vineyard. These vines will be in their 3rd leaf this coming year.

Cultivar	Rootstock	Total	Live	Dead
Noiret	101-14	100	41	59
Petit Manseng	101-14	100	7	93
Rubaiyat	own	100	37	63
Traminette	101-14	100	19	81
Cynthiana	own	100	16	84
<b>Frontenac gris</b>	<b>own</b>	<b>100</b>	<b>78</b>	<b>22</b>
Lemberger	3309C	100	26	74
Gruner Veltliner	101-14	100	3	97

Lemberger also was better than all other vinifera tested. Read more about it here:

<http://viticulture.hort.iastate.edu/cultivars/Lemberger.pdf>.

For more bud damage recording see the next page. There you will see how buds fared in our older variety trial.

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## Bud Damage Results from Perkins

Cultivar	Rootstock	Primary Buds Observed	Live Primary Buds
Cab Franc	own	75	0
Cab Franc	3309C	100	0
Cab Franc	110R	45	0
Cab Franc	1103P	50	0
Cab Franc	St. George	100	0
Rubaiyat	own	60	39
Villard Blanc	own	100	43
Traminette		100	19
Noiret		100	16
Valvin Muscat		100	2
Cab Sauv	own	50	0
Viognier	own	75	0
Chambourcin	own	55	9
Sangiovese	1103P	40	0
Malbec	1103P	35	0
Sangiovese	own	40	0
Malbec	own	35	0
Cab Sauv	1103P	25	0
Viognier	1103P	80	0
Neptune	own	95	6
Merlot	own	100	0
Shiraz	1103P	50	3
Merlot	1103P	100	1
Chardonnay	1103P	30	0
Pinot gris	1103P	50	2
Pinot gris	own	50	0

As you can see, rootstock made no difference in the severity of damage incurred.

## What Should Buds Look Like (and Not)?

Eric T. Stafne

See photos here for images of what you would like your grape buds to look like:



As you can see, all three buds are alive, no hint of brown or black color. This is a deep cut of the bud though. First cut shallower to expose the primary bud first (as that is the one of most interest) and then make successive cuts to show the secondary and tertiary buds. Cutting too deep usually shows green tissue, thus possibly leading to a false positive (or negative — meaning it is green so must be alive, but only the subtending tissue is alive and the bud itself is dead).

And, not so much:



In this case the primary bud is dead, showing a black center and brown around it. The secondary bud is alive however. The tertiary is not exposed, as a deeper cut would need to be made in order to show it.

Wait to make the cuts until after a few days have passed in order for the damage to manifest itself. If it is done too quickly then the tissue may still appear healthy when it actually is dead.

## Cultivar Spotlight: Neptune

Eric T. Stafne

This issue I am focusing on a table grapes. ‘Neptune’ was released from the University of Arkansas breeding program in 1998. It was derived from a cross between A-1562 and A-1704, two Arkansas selections. It is a seedless, white grape that is non-slipskin and has a fruit flavor, but not foxy. This cultivar has excellent clusters that are fairly large and loose enough to deter much bunch rot. The berry size is medium, not as large as some table grapes, but certainly large enough to be pleasing. Yields are moderate for a table grape, in the 5 tons per acre range. This cultivar matures in early to mid-August usually. It’s cold hardiness is moderate for a table grape, so it can withstand temperatures down to  $-15$  to  $-20$  F without devastating damage. We did see primary bud death this year at  $-13.5$  F, but expect to see some secondary crop. The vine itself has medium to low vigor making it a good choice on sites where excess vigor could be a problem. The fruit is also resistant to cracking, which can be a problem on other cultivars in years where rainfall during harvest is present. Overall, this cultivar has performed well in our trials at Perkins and is one that I would recommend for someone interested in growing table grapes.



*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.*

## **Pruning to Compensate for Bud Damage**

**Eric T. Stafne**

So you have cold damage to your grapevine buds. You know that by going through the vineyard and randomly testing representative vines.

But now, it is time to start pruning. Budbreak is just around the corner and you need to get it done before the vines get rolling. So what do you need to know? If the damage to your primary buds is 20% or less then you don't need to do anything different. I have also seen recommendations that lower that percentage to 10 or 15%; however, most grapevines will produce some crop on secondary buds, so those will act as compensation for the lost 20%. If the primary bud damage is in the 20 to 80% range, then leave more buds in proportion to the amount that was lost due to the cold damage. For example, if one normally leaves 40 buds on a vine and the damage is 70%, the new amount to leave is 68 buds ( $40 \times .7 = 28$ ,  $28+40 = 68$ ).

If the primary bud damage is greater than 80% then I recommend doing only minimal pruning. Clean up material that is touching the ground, shorten canes so that you can work under the vines, top them (in case of VSP), but leave lots and lots of buds. If you are surprised by the amount left, then you can always come back later and remove some. But at the same time, don't remove too many — if there is little or no crop, new growth may be extremely vigorous, leading to unwanted bull canes. Leaving more competing growth will slow down that vigor some.

If your buds were really damaged (multiple buds dead within the compound bud) then there may be wood damage as well to deal with. This may mean the need to retrain cordons and trunks. Choose new canes with good growth, but not excessive vigor, as replacements. Wood damage is not always easy to see — it can look like brown or black streaked or water-soaked. Sometimes vines may break bud normally then crash when heat and other various stresses get to it.

The best advice I can give at this point is to know your vines and do your best with good, sound management strategies.