**President’s Message**

Happy New Year! Let the 2018 vintage year begin. I know from driving around that some of you, like me, have already started to work in your vineyards, but January 1 is usually the start date for pruning to begin in earnest. Since I am replacing about 70% of my vineyard, I have been busy since harvest working on removal. My only consolation is that I have many fewer vines to prune this year. I hate to wish for rain at a time when we would like to be out in the vineyards, but our dry year so far has me looking with anticipation at the forecasts for wet weather to come.

We had some very generous donations in December to the SOREC Viticulture Research Fund. Phil Van Buskirk, long time supervisor at SOREC, donated $2,500. Asante Foundation, maintaining their close ties to the wine industry, donated another $2,500. We matched both of those donations with funds from the RVWA treasury with another $5,000, for a total deposit into the fund of $10,000. Alex Levin is doing a great job of spearheading research, and this $10,000 will hopefully help in his efforts.

We will hold our **annual dinner/meeting on February 4** this year, at the usual place, the U S Hotel Ballroom in Jacksonville. We will open the doors at 5pm, with sign in and social hour from 5-6pm. The annual meeting will be from 6-7pm, with a few items of business and a short presentation by Alex Levin before Greg Jones’ annual vintage report and climate forecast. The dinner will be catered by Platon from the Jacksonville Inn, so expect great food to go with the nice wine you bring from our region. We have been at capacity for the last few years, so get your reservations in by emailing kjohnpratt@gmail.com as soon as possible.

The Oregon Wine Board is hosting the Oregon Wine Symposium in Portland on February 20. 21. Interested in a 30% discount in the price of admission? Purchase your picket before January 15. If you are a member of OWA, of course, you are entitled to a $60 discount, and if your business is bringing a group of four or more, you are entitled to a 30% discount. Educational sessions are offered in four tracks, viticulture, enology, management and marketing, and the OWS is always a good place to learn about the entirety of the Oregon wine industry. I hope to see you there. The OWB has asked me to serve as the Board Chair for the current year (God help them!), so you’ll probably see more of me than you want, but I always enjoy seeing my friends from So OR. The Oregon Wine Soiree is held from 5-7pm on Tuesday evening, February 20, and I will look forward to seeing many of you there.

Next to the OWS, of course, in importance and attendance, is the Southern Oregon Grape symposium, held this year on Tuesday, March 13, at SOREC. Alex Levin has done a great job of organizing speakers who will provide useful information to help you in your vineyard operation. We will provide breakfast snacks and lunch, with a cost to RVWA members of $25. Nonmembers will be $50. We are a couple of months away, but feel free to RSVP by emailing me at kjohnpratt@gmail.com.

As we begin this year, the 90-day weather forecast (see Greg Jones climate update at rvwinewgrowers.org) shows likelihood for an average late winter early spring. If that brings bud break abut the normal average time of mid-April, I will be satisfied. Too early, and we can have ripening too early in the summer. We have been having great weather for beautiful harvests for the last few years, despite the lingering smoke, and I hope for the same this year. Paz--John

**Upcoming Events**

**RVWA Annual Meeting and Dinner**

**Where:** U S Hotel Ballroom, Jacksonville

**When:** 5-9pm, Saturday, February 4

**Cost:** $37.50/person, payable at the door or at rvwinwegrowers.org

RSVP by January 30 to kjohnpratt@gmail.com

If you signup, and don’t cancel before January 30, you will be responsible for your dinner charge.

**Oregon Wine Symposium**

**Where**: Portland Convention Center

**When**: February 20, 21

Register at <https://industry.oregonwine.org/education/oregon-wine-symposium/>

**Southern Oregon Grape Symposium**

Where: SOREC

When: 8am – 3pm Tuesday, March 13

Program: Morning Seminars: Glenn McGourty (UCCE-Mendocino), Dr. Patty Skinkis (OSU), Dr. Bhaskar Bondada (WSU), Dr. Elizabeth Tomasino (OSU)

Afternoon Industry panel on labor and mechanization: Michael Moore (QRV), Geoff Hall (Argyle), Joey Meyers (Vinetenders)

Spanish session Basics of grapevine pathology: Dr. Luisa Santamaria (OSU)

At the end: tasting of research wines (Measures for Dealing with Red Blotch) from Alex Levin’s and Achala KC’s work at the DeBoer Ranch with QRV.

**Oregon Wine Board Reception**

Where: Inn at the Commons

When: 5pm, Wednesday, March 28

The OWB will hold its meeting the next day, and is hosting a reception for everybody in the in industry the night before. Please join us. Meet your Oregon Wine Board.

**Membership**

Well, it’s that time again! I will be sending out membership invoices very soon. Thank you so much for your support last year, which enabled us to match $2,500 donations from Phil Van Buskirk and Asante Foundation with $5,000 from our own treasury to make a deposit into the SOREC Viticulture Research Fund just before the end of 2017. All our resources go toward education and research. If possible, please remit payment as soon as possible so I won’t have to send out second reminders later. Thanks.

**Fruit Flies Play Role in Sour Rot Complex : Insecticide Needed to Prevent Problem**

by Megan Hall, Gregory Loeb and Wayne Wilcox

Sour rot is a term that is widely and somewhat inexactly used to refer to a group of late-season bunch rots that are particularly problematic on tight-cluster or thin-skin grape varieties. In California, it is another name given to a complex of fungal species and other microorganisms often referred to as summer bunch rot, which is reported to begin attacking berries when they reach a maturity stage corresponding to 8° Brix. In many other parts of the world, and in most of the published literature, sour rot is a syndrome characterized by decay, oxidation (browning) of the berry skin and the smell of acetic acid (vinegar) emanating from diseased grapes that break down and begin to leak their contents, hence the “sour” designation.

Although mold fungi such as those in the California complex are sometimes present as secondary decay organisms, they are not necessary components of this form of sour rot elsewhere (see photo above). Studies conducted on Riesling, Pinot Noir and other V. vinifera cultivars in Ontario, Canada, have shown that they are not susceptible to such disease development until they reach a maturity stage of 15° Brix.

To successfully manage a disease, it is important to identify the specific organisms involved and how they interact with the plant host and environment to produce the condition. In the past four years, we have studied sour rot in the laboratory and a series of vineyard trials in New York to identify specific organisms and conditions that are needed for sour rot to develop there and, consequently, how to manage it. This has allowed us to develop a definition of the disease as seen in eastern North America, Europe, Oregon and elsewhere—as well as a pesticide program to manage it—and to identify significant differences in disease severity related to trellising systems. Wounds are important Although sour rot occurs sporadically, it has been reported worldwide where and when conditions for the disease are favorable. Such conditions are poorly defined but often include pre-harvest rains and temperatures regularly exceeding 65° F during the final stage of ripening. Once sour rot begins, typically following rain that occurs after berries reach 15° Brix, it often spreads rapidly. Wounds are necessary for entry of the yeast, bacteria and fruit flies that are causal components of the sour rot complex, and these microorganisms are distributed to them by rain or heavy dew. Although such wounds are sometimes due to birds and insects, sour rot more commonly begins through cracks in the grape skin caused by rain or by swelling of the berries as they take up water and pull away from pedicels (berry stems) in tightly compressed clusters shortly before harvest.

In the summer bunch rot complex in California, rain is not a requirement. Skin-splitting from irrigation, temperature flux and/or rapid growth appear to provide wounds for entry of the causal organisms, then wind, insects and perhaps birds seem to facilitate disease spread. It also seems likely that the various mold fungi that enter these wounds as early as 8° Brix cause decay and further breakdown of the berries, allowing yeast and bacteria to enter later and produce the acetic acid responsible for the smell of vinegar, although this has not been proven. Wounds also let oxygen into the berry. This is necessary for the conversion of ethanol, first produced by yeasts, to acetic acid by specific bacteria within the berry. In turn, volatilization of ethanol and acetic acid attract Drosophila fruit flies that feed on the yeast and bacteria producing these compounds, and the insects then spread the microorganisms to new berries. Determining the cause of sour rot Our study began with the collection of sour-rotted clusters from 16 vineyards in the Finger Lakes region of New York. High levels of both ethanol and acetic acid were found (averaging 1.14 g/L and 1.58 g/L, respectively, in two years of sampling). More than 1,300 individual microbial isolates were recovered, more than 90% of which fell into four categories: two Metschnikowia spp. yeast strains, Gluconobacter cerinus (an acetic acid bacterium, or AAB), and a ubiquitous environmental bacterium (Rahnella sp.) neither associated with acetic acid production nor considered a plant pathogen. A series of experiments was begun in the lab to determine whether the recovered micro-organisms were, in fact, causing the disease. Berries of V. vinifera cultivars Cabernet Franc, Chardonnay and Red Globe were wounded and inoculated with 21 different individual yeasts, mold fungi, bacteria or combinations thereof. One set of inoculated berries was exposed to fruit flies (Drosophila melanogaster), while a companion set was not. After eight days of incubation, berries were rated for rot and browning on a scale of 0-4, then macerated and the juice measured for acetic acid content. Berries were determined to have sour rot if they had a visual disease rating of 3 or 4 and an acetic acid content of at least 0.83 g/L (based on the ranges detected in field samples).

However, these combinations produced sour rot symptoms only on berries also exposed to wild type Drosophila fruit flies, which carry their own microbiota. When inoculated berries were not exposed to the flies, typical sour rot symptoms did not develop. To determine whether the effect of the flies was due to microorganisms that they contributed or to some non-microbiological factor, colonies of axenic fruit flies were developed. These were reared in sterile media, rendering them devoid of gut and surface microbiota. In a series of similar inoculation experiments utilizing Red Globe grapes and multiple combinations of microbes plus axenic fruit flies (or not), only the following microbial combinations (each consisting of a yeast and AAB species) consistently caused sour rot symptoms, and only in the presence of axenic flies: • Saccharomyces cerevisiae x Acetobacter aceti • Saccharomyces cerevisiae x Gluconobacter oxydans • Pichia kluyveri x Acetobacter aceti • Pichia kluyveri x Gluconobacter oxydans

Three components essential for sour rot disease development The results show that three components are essential for sour rot disease development: Yeast, which first produce ethanol from the juice of affected grapes, Acetic acid bacteria, which convert this ethanol to acetic acid, Drosophila fruit flies, which contribute to the breakdown of infected berries and the liberation of acetic acid volatiles responsible for the characteristic vinegar smell. (Similar results were obtained in some parallel studies comparing the effects of D. melanogaster, the common fruit fly, and D. suzukii, the spotted wing Drosophila, which is not a common pest on grapes in North America). None of these elements cause disease symptoms on their own. In nature, yeast and acetic acid bacteria may originate from several sources: the outer surface of healthy berries (albeit in low numbers), inside healthy berries (various non-Saccharomyces yeasts such as Pichia spp. were repeatedly isolated from inside healthy berries obtained from vineyards in New York, California and Washington state, in addition to AAB on occasion) and Drosophila fruit flies. In addition to making a vital non-microbial contribution to sour rot development by facilitating their breakdown, fruit flies also vector the causal yeast and bacteria both on the outside of their bodies and by transferring gut microbes during feeding, thereby spreading the disease rapidly once it has begun. Thus, sour rot control programs in the vineyard ideally should include measures targeting both the abovementioned microbes and fruit flies. Chemical control trials In three spray trials conducted in 2013, 2015 and 2016 in Geneva, N.Y., various antimicrobial and insecticide treatments—both alone and in combination—were applied to a vineyard planted to Vignoles (a tight-cluster interspecific hybrid variety) to test their effect on sour rot development. In each trial, alternate vine rows were sprayed with an insecticide (Delegate in 2013 or Mustang Maxx in 2015 and 2016) or left untreated. One- or two-panel plots were treated with antimicrobial materials (potassium metabisulfite, Kocide 3000, OxiDate 2.0 or Fracture) at various timings and rates. Note that potassium metabisulfite (KMS), a common disinfectant in the winery, is not registered for use in the field but was included in these tests as a “proof of concept.”

Insecticides were applied weekly when fruit reached 15.0° Brix, the stage where berries start to become susceptible to sour rot. The start of weekly antimicrobial treatments varied; their timing is listed in the table as: • Pre-symptoms starting at 15° Brix, • Starting when sour rot symptoms were first visible, • After the first rain following 15.0° Brix, • Following an increase in maximum daily dew point over three days, and • No treatment. Insecticide (plus antimicrobials) provided control In 2013, antimicrobial and insecticide treatments applied in combination provided significant control of sour rot with a reduction in disease severity (percent of cluster area diseased) of 30% to 54% compared to the unsprayed treatment. The vines treated solely with antimicrobial sprays did not experience a significant reduction in sour rot, nor did the treatment in which only insecticide was applied. Significantly greater sour rot pressure was seen in 2015, with nearly 30% of berries diseased on vines receiving no insecticide or antimicrobial treatment, compared to 16% in 2013. In contrast to 2013, the insecticide alone provided significant control (57% reduction relative to untreated vines) without addition of an antimicrobial treatment. Disease control increased significantly (73% to 84% reduction) in those panels where both antimicrobial and insecticide treatments were applied weekly starting before the onset of symptoms.

However, when the addition of antimicrobial treatments was delayed until symptoms appeared, the combination treatments did not provide significantly more control than the insecticide alone. Furthermore, even when applied on a preventive basis before symptoms appeared, antimicrobial treatments applied alone were relatively ineffective and never provided the same level of control as insecticide applied alone. Sour rot severity on untreated vines in 2016 was comparable to 2015. Significant control (40%) was provided when insecticide was applied without the addition of an antimicrobial treatment. Further control was achieved when any of three antimicrobial treatments was combined with insecticide starting before the onset of symptoms, whereas delaying addition of an antimicrobial treatment until symptom onset increased control for only one of the two materials tested (see “Sour Rot Control, Field Trial,” below).

Three years of chemical control trials demonstrated the importance of insecticide sprays in controlling sour rot, and the additional control provided when antimicrobial sprays were combined with insecticide before the onset of symptoms. In all three years, applying KMS weekly beginning at 15° Brix (pre-symptoms) in conjunction with an insecticide achieved an average 65% control compared to the unsprayed treatment, and in the two years when OxiDate 2.0 was included in conjunction with Mustang Maxx on this schedule, an average 69% control was achieved. In the two years when Mustang Maxx was the insecticide used, it provided significant control (48% average) when applied alone, whereas antimicrobial treatments applied alone on this same pre-symptom schedule provided only 28% control when averaged for all materials across the three trial years. For growers deciding whether to apply only an insecticide or antimicrobial product, the insecticide appears to be the more important component of the mix. Also noteworthy is that initiating antimicrobial sprays before the onset of symptoms was more effective than using a limited number of applications after symptoms appeared. The experimental design did not allow examination of the effect of insecticide applications alone if initiated after development of disease symptoms.

Integrated control is necessary The sour rot complex is a dynamic system involving yeast, AAB and Drosophila fruit flies. The species of yeast can vary, as it can for the AAB and fruit flies, yet all three components must be present in order for symptoms to develop. An integrated control program for sour rot should utilize both canopy management and spray applications that target yeasts, AAB and Drosophila spp., although the best protocol for timing of such spray applications has yet to be determined. Additional trials under commercial or large-plot conditions should help identify the most efficient timings to balance the competing desires to minimize spray applications while maximizing control, although existing data suggest that control is likely to be maximized by initiating sprays before an epidemic is in progress. It is important to note that these studies have been conducted with a susceptible cultivar in a climate favorable to development of severe disease symptoms. While we did not specifically study cultivars and climatic variables, management recommendations may vary for vineyards with cultivars that have thicker skins and looser clusters and/or in a less conducive environment for the disease.

Nevertheless, this perspective on understanding the sour rot complex is not only applicable to New York grapegrowers but may be pertinent to growers worldwide who experience sour rot as a challenge in their vineyards. The sour rot complex is somewhat unique because we are targeting multiple unrelated causal organisms in control programs, but now there is a more comprehensive understanding of how the disease develops and, in turn, how to manage it.

Read more at: <https://www.winesandvines.com/features/article/193818/Fruit%20Flies%20Play%20Role%20in%20Sour%20Rot%20Complex>
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