University of California Cooperative Extension Fresno County

Vine Lines

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Managing Grapevine Canker Diseases

Stephen Vasquez and George Leavitt

As harvest begins to wind down, growers are starting to decide whether their canker infected vineyards are financially fruitful. Vineyards affected by canker diseases can have reduced yields ranging between 15-80% according to some research. Making a decision on what to do with a declining vineyard will depend on the percentage of yield loss and the price received for the grapes. Older vineyards planted to Colombard, Grenache, Rubired, Zinfandel or other varieties often display the greatest amount of disease due to the multiple large cuts made during winter pruning. Their value and health of the vineyard will dictate whether a vineyard is "pushed out" or if alternative management practices can help increase yields for a few more years. Valley winegrape vineyards typically have a life-span of 25-30 years before replanting is considered, but can last many more with proper canker management.

Grapevine cankers are caused by the fungi *Eutypa lata* and *Botryosphaeria* spp. and are both capable of infecting through shoot positions (arms and spurs, See Figure 1), other large pruning cuts and wounds caused by machinery (mechanical harvesters), ultimately killing grapevines. Although replanting is inevitable for vineyards displaying canker diseases, there are some effective short- and long-term management strategies that will help minimize or prevent future infections. Keep in mind that the short-term strategies will only extend the life of a vineyard approximately 5-7 profitable years, at which time it will need to be replanted.

(Continued on page 2)

Late Season Approaches to Reduce Vine Mealybug Near Harvest in Table Grapes

David Haviland and Jennifer Hashim-Buckeye

Vine mealybug is one of the most prolific pests of table grapes (Fig. 1). Its exponential growth rate and affinity for feeding within clusters close to harvest make its management of highest priority for grape growers dealing with infested vineyards.

Traditionally, vine mealybug is managed with a combination of post-harvest and/or delayed-dormant Lorsban treatments in combination with in-season treatments of the growth regulator buprofezin (Applaud), and neonicotinoids such as Admire or Venom. However, in many cases these treatment programs do not suffice and additional contact insecticides are needed close to harvest to keep the clusters free of mealybugs.

Over the past few years, methomyl (Lannate) has been the product of choice for late-season insecticide treatments aimed at keeping clusters free of mealybugs. This has been due to its contact mode of action and ability to use the product close to harvest when PHIs for other products preclude their use.

In late May of 2008 we conducted an insecticide trial to evaluate the effectiveness of 1 lb of Lannate, as well as an alternative program of a tank mix of 2.5 oz of Assail 30SG and 12 oz of Applaud 70DF, on vine mealybug. The trial was located in a bearing, two-year old vineyard that was

(Continued on page 4)

Managing Canker Disease

(continued from page 1)

Long-term strategies have the potential to double a vineyards life and increase yields, with some yield loss after implementation.

Short-term Strategies

Recently, double pruning has been shown to minimize infection by *Eutypa lata*. A single pass using a mechanical pruner (hedger) eliminates the majority of one-year old wood. What remains are canes that extend approximately 20 inches from the cordon. Pre-pruning takes place prior to the first heavy rains. The extended canes are then pruned to a 2-bud spur in early spring, thus eliminating any infections that occurred during the wet winter. This approach is feasible on a small scale but could be costly when acreage is large and scattered throughout the valley.

The most common method of preventing canker infections includes the use of chemicals (thiophanate-methyl) painted onto fresh pruning wounds. Additional applications may be necessary when rain is forecast over a period of weeks. Chemical applications must be focused on the pruning wounds in order to maximize fungicide efficacy. To improve the application process, a dye is added to the fungicide mixture to help identify missed applications. The use of chemicals coupled with replacing spur positions can help increase yields. Blank spots along a cordon can benefit from developing multiple spurs at a single position, known as "rabbit ears". When vines are healthy, rabbit ears are discouraged because they can contribute to over cropping. However, they can be useful in replacing spur positions and maintaining yields.

The removal of infected wood—dead arms and cordons—from vineyards will help reduce the inoculum load. New spur positions will often grow from dormant buds and replace the weak or missing spurs. If an entire cordon must be removed, one or two canes can be tied to the wire in its place. In the spring, shoots can be thinned to the appropriate number in order to space arms evenly along the wire. If the vineyard is north of Merced County, dead wood should be removed from the vineyard and taken to a local landfill so it does not become a source of inoculum.

One final short-term approach is to let the diseases run their course. Depending on the variety and inoculum load, the vineyard will succumb to the disease within 20+ years. Growers will then have the opportunity to replace the vineyard with the same variety or with something more profitable. Some vineyards may be candidates for "slick" pruning, a practice that involves removal of the spurs down to the cordon. This approach allows a vine to become rebalanced by encouraging new growth along the cordon. Often, buds lie dormant for long periods of time being suppressed by the dominant buds further up on spurs and arms. By slick pruning a vine, the dominance imparted by the apical buds is removed and the vine will display a renewed vigor. This approach is often practical for older vineyards planted to varieties that are in demand. Vineyards that have reduce yields that are 40-50% or normal will often benefit from this practice. Prior to implementing slick pruning, an inventory of the entire vineyard should be taken to determine if all or part of the vineyard should be aggressively pruned. Cordons that are dead will need to be replaced with 1-2 canes tied to the cordon wire, as previously mentioned. It should be noted that slick priming will create numerous large wounds that should be chemically treated to prevent infections.

Figure 1. Weak spur position and shortened cordon due to Eutypa dieback.

(Continued on page 3)

Managing Canker Disease

(continued from page 2)

Figure 2. New trunk developed from a sucker produced from below ground.

Long-term Strategies

When vines and yields begin to decline significantly, own-rooted vines can be retrained. A grapevine with a complete loss of fruiting wood can be cut at the trunk base to encourage new growth. A sucker coming from below ground is then trained up the existing stake with cordons developed the same year (Fig. 2). Vines will often return to full production within two years. Individual vines displaying significant loss are good candidates for a complete retraining. A vineyard with a chronic infection from fungi causing cankers may have 10% of the vines undergoing retraining in any given year. The use of multiple trunks may be a suitable option for highly susceptible varieties. This allows yields to be maintained over the life of the vineyard but can be more costly to manage.

Before employing any of these management practices for canker diseases, growers should determine which practice best fits their circumstances. The amount of yield loss, vineyard age, frequency of infection throughout a vineyard and variety will determine what approach will be most feasible for ones operation. One or multiple practices may prolong the life of a vineyard making it more profitable than replanting.

Additional information:

Eutypa dieback: http://ucipm.ucdavis.edu/PMG/r302100611.html

Bot Canker: http://ucipm.ucdavis.edu/PMG/r302101011.html

Stephen Vasquez is the viticulture farm advisor in Fresno County. George Leavitt is the viticulture farm advisor, emeritus in Madera County.

Glyphosate Resistance

Because of its broad-spectrum, economical weed-control ability, glyphosate (the active ingredient in RoundUp, and other product names) has become a popular weed management tool for agricultural crops and in nonagricultural settings such as parks, schoolyards, and public and natural areas. However, in recent years at least 14 glyphosate-resistant weed species have been reported in agricultural systems, threatening the loss of this effective herbicide. These include rigid ryegrass (*Lolium rigidum*), horseweed (*Conyza canadensis*) and hairy fleabane (*Conyza bonariensis*).

Anil Shrestha, formally the IPM weed ecologist at the UC Kearney Agricultural Center, says that although crops genetically engineered to resist glyphosate (called "RoundUp Ready") have been the primary resistance concern in the United States and some other countries, as of now no confirmed cases of glyphosate-resistant weeds have been reported in Roundup Ready crops grown in California (primarily cotton and corn).

Furthermore, poor control of several other weed species with glyphosate is occasionally reported to UC personnel, Shrestha says. "Because of its ease in use, environmental safety and effective control of weeds, it is important to maintain the viability of glyphosate in California." Experts recommend using a variety of weed control tactics, including combining glyphosate with other postemergent herbicides.

Full article at California Ag.: http://calag.ucop.edu/

Vine Mealybug in Table Grapes

(continued from page 1)

grafted over to 'Summer Royal' in 2006. A total of 0.4 acres was divided into 12 plots that were each 2 rows by 10 vines long, and that were each assigned in a randomized complete block design to one of the two treatments or an untreated check. Treatments were applied at 200 GPA on 20 May using an air-blast sprayer. Plots were evaluated prior to treatment, 3 days after treatment (DAT), 8 DAT and 17 DAT by doing timed searches on six or eight vines in the center of each plot. Searches were performed by stripping bark and counting all motile forms of vine mealybug that could be found within 3 minutes.

Results showed that Lannate and the Assail/Applaud tank mix both caused significant reductions in the number of vine mealybugs per 3-minute search on all post-treatment evaluation dates. Comparisons of the two treatments to each other revealed no significant differences, with both knock-down and residual activity very similar.

There are, however, some additional considerations that growers and PCAs should make when interpreting this data for their own use. On one hand, efficacy of these treatments is likely overestimated because 1) bark stripping the trunk during our pre-counts caused increased exposure of the mealybugs to the pesticides than would occur normally, and 2) vines were young and therefore had relatively small amounts of bark compared to mature vines. On the other hand, efficacy of these treatment programs is likely underestimated because 1) at our treatment timing most mealybugs were still under the bark and not as exposed as they would be when mealybugs get up on the leaves and enter the clusters, and 2) timed searches underestimate high mealybug populations. This means that vines with low populations might have every mealybug counted during the 3 minutes, whereas only a portion of the mealybugs can be counted in 3 minutes on a heavily infested vine.

Figure 1. Vine Mealybug damage on grapes.

In conclusion, both the Lannate and the Assail/Applaud treatments provided good knock-down of vine mealybug close to harvest. However, these treatments were far from perfect, and should only be utilized as a last resort. This is especially true due to the cost of the Assail/Applaud tank mix, as well as the ongoing regulatory scrutiny of Lannate residues that has the potential to cause table grapes to be removed from the label.

Table 1. Effects of insecticide treatments on vine mealybug density

Treatment	Rate form. prod. per ac	Mealybugs per 3-minute times search			
		Pre-counts	3 DAT	8 DAT	17 DAT
Lannate SP[1]	1 lb	124.7 a	53.1 a	4.1 a	41.5 a
Assail 30 SG+ Applaud 70DF[1]	2.5 oz + 12 oz	146.9 a	62.0 a	3.2 a	52.3 a
Untreated Check		156.3 a	93.6 a	39.5 b	108.9 b
F		1.37	1.60	9.12	8.31
P		0.3245	0.2776	0.0152	0.0187

[1] Latron B-1956 used as a surfactant at 0.0156% v/v

Means in a column followed by the same letter are not significantly different ($P > 0.05$, Fisher's protected LSD) after square root (x + 0.5) transformation of the data. Untransformed means are shown.

†Applications of methomyl made after August 15 have a 21 day restricted entry interval. This interval may be terminated after 10 days if leaf samples tested show 0.1 micrograms per square centimeter or less of dislodgeable foliar residue. Call local Agricultural Commissioner's office for more information.

David Haviland and Jennifer Hashim-Buckeye are both UC Cooperative Extension farm advisors in Kern County.

Calendar of Events

Local Meetings and Events

Save the Date!
San Joaquin Valley Grape Symposium
January 7, 2009
C.P.D.E.S. Hall
172 W. Jefferson Avenue
Easton, California

U.C. Davis University Extension Meetings

(800) 752-0881

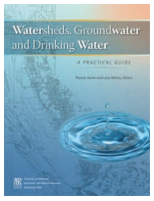
Taxation and Accounting for the Small Vineyard
October 23, 2008
9:00 a.m. — 4:00 p.m.
Da Vinci Building
1632 Da Vinci Ct.
Davis, CA
Instructor: L. Gregory Scott
Section: 082VIT205

Taxation and Accounting for the Small Winery
October 24, 2008
9:00 a.m. — 4:00 p.m.
Da Vinci Building
1632 Da Vinci Ct.
Davis, CA
Instructor: L. Gregory Scott
Section: 082VIT206

Establishing a Small Vineyard
October 25, 2008
9:00 a.m. — 4:00 p.m.
198 Young Hall, East Quad
Davis, CA
Instructor: Donna Hirschfelt and Rhonda J. Smith,
Section: 082VIT201

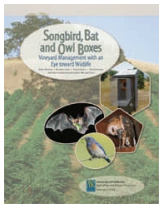
Current Issues in Vineyard Health
November 13, 2008
9:00 a.m.— 4:00 p.m.
Da Vinci Building
1632 Da Vinci Ct.
Davis, CA
Instructor: Deborah Golino
Section: 082VIT203

Publications from the University of California



Watersheds, Groundwater and Drinking Water: A Practical Guide
ANR Publication 3497
Price - $40.00 + tax and shipping

This handy guide is a "must-have" for environmental scientists, water technicians, educators, and students. Water shed and groundwater hydrology fundamentals are discussed.



Songbird, Bat, and Owl Nest Boxes
ANR Publication 21636
Price - $15.00 + tax and shipping

This guide explains the benefits of the biodiversity and aesthetics of songbirds, bats and owls. Methods on how to integrate nest boxes within a vineyard are discussed.

Order Form

Publication	Qty.	Price	Subtotal
Watersheds Guide		$ 40.00	
Songbird, Owl Boxes		$ 15.00	

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In This Issue: