COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

November 2006

Fall & Winter Disease Control in Grapes

by Maxwell Norton and Stephen Vasquez, UC Cooperative Extension

Several grape diseases have fall and winter management practices in addition to the main program in spring and summer. To become familiar with the symptoms of theses disease, pick up a copy of Grape Pest Management-ANR Publication 3343 from your local Cooperative Extension office or go to *ipm.ucdavis.edu* and go to agriculture > grape > diseases.

Bunch rot: If bunch rot was caused primarily by Botrytis and infections were severe this year, the remaining fruit should be removed. Fruit that persist will become an overwintering inoculums source for the following season. If there was significant botrytis shoot blight during the spring of 2006, those shoots that were not removed during thinning should be pruned off. Canes and fruit removed during the dormant season should be shredded and disced in.

Phomopsis: Look for and prune out spurs and canes that appear grayish-white and display Phomopsis scars. Left on the vine, they will become inoculum sources the next season during beginning at budbreak. Canes or spurs heavily infected with Phomopsis are often dead and do not push the following season.

Measles: Vines that show fruit and foliar symptoms year after year should be removed. During the summer you can spray paint a mark on symptomatic vines and add a mark each year they continue to be symptomatic. Growers should monitor vineyard yield to determine if production has dropped to a level that affects the "bottom line".

Pierce's disease: Vines with Pierce's diseases symptoms should be eliminated. Their removal will reduce the bacterium inoculum in the vineyard, thus reducing the movement of the disease further into the vineyard.

Eutypa: Pruning cuts more than one year old can be protected by daubing or spaying them with a fungicide. Wounds should be protected shortly after pruning crews have moved through the vineyard.

Powdery mildew: Dormant sprays for powdery mildew are usually not warranted in the San Joaquin Valley. In the Coastal regions and some parts of San Joaquin and Sacramento Counties a dormant spray will help manage Phomopsis and powdery mildew where sexual stage is viable. Efforts should be directed at a thorough early spring program beginning at budbreak, taking into consideration location, cultivar and canopy management practices.

Contact your local Cooperative Extension Farm Advisor for the most current information on these diseases and local recommendations.

Peach Leaf Curl Disease

by Maxwell Norton, UC Cooperative Extension

Peach leaf curl (PLC) disease was widespread this spring – even in orchards with good disease management programs. This was due to the prolonged wet spring. With peaches and nectarines, PLC control should be a part of your routine disease control program. Fixed copper, Bordeaux, Ziram and chlrorothalonil are commonly used to control PLC. Visit **ipm.ucdavis.edu** and go to agriculture > peach > diseases - for more details on the spray program.

Microirrigation System Maintenance

Dan Rivers, UC Cooperative Extension, Merced County

As with any permanent irrigation system, routine maintenance is important for keeping a microirrigation system operating at peak efficiency. This includes regular cleaning of filters and flushing of mainlines and laterals. By frequently checking your filter initially, you can settle in on a cleaning schedule that is based on water quality and irrigation frequency. A

difference in pressure of 5 psi across a filter can also be a good indicator. Many systems are self-cleaning based on a pressure differential. In addition, even with good filtration, materials get through that could potentially plug emitters. Again, frequent checking of mainline flush valves and hose ends for accumulated material initially can help you decide how frequently to flush these lines.

Occasionally it is necessary to add cleaning agents such as chlorine and/or acid to your microirrigation system. Surface water sources are often high in organic matter, which can build up in the lines and plug emitters. Chlorination with household bleach, calcium hypochlorite or chlorine gas in different concentrations and treatment frequencies can be used depending on the amount of microorganisms present in the water. Groundwater sources are often high in mineral content, which can precipitate out and clog lines and emitters. This water can be treated with sulfuric, hydrochloric or phosphoric acid or a nitrogen fertilizer/sulfuric acid mix. It is important when injecting chlorine or acid to inject the material at the desired concentration for a long enough period to treat the entire system. This should be followed by a fresh water application of an equal or greater volume to flush the lines. Help with determining proper rates and concentrations and with selecting injection equipment can be found at your local farm advisor's office or irrigation supply stores.

November Pistachio Task List-2006

by Bob Beede, UC Cooperative Extension, Kings County

This is a year I wish not to repeat in the near future. Low chilling hours and a cold, wet spring teamed up on us to delay leaf out and bloom by as much as 21 days. Then the leaffooted bug attacked with a vengeance, leaving many growers worried about having enough pistachios to meet expenses. Many growers maxed out on premethrin usage fighting plant bugs and the fear of navel orangeworm (NOW). As harvest approached, we took turns scaring each other about uneven and delayed maturity, excessive closed shell and high blank percentages. When the "normal" harvest time arrived, all we could find in the field was gourd-green nuts and watching them daily became painful, like not having a date for the senior prom. Harvest finally got rolling about 14 days later than normal. Most of us were surprised to find many orchards with pretty nice crops, and the quality was excellent. Nut size was large, to the point that excessive shelling could occur during hulling. Chuck Nichols' report that split nut percentages were eight percent higher than the last five-year average was also evident. In the oil trials on young trees out at Munger Investments in Burrel, we recorded over 2200 pounds on six-year-old trees! NOW damage has also been low. In short, the 2006 quality appears excellent and buyers ought to hurry and get some of "the good stuff". Once again, the pistachio tree continues to humble and amaze us with its elasticity!

BOT WATCH: Many growers will not have to look very hard this fall for dead and blackened, one-year-old shoots and nut rachises, which are usually infected with Botryosphaeria. Prune out this infected wood when the shoots are still easily identified and fall rains have not yet spread the fungus to the fruit buds. Pruning out Botryosphaeria is not as expensive as the losses reported from heavily infected orchards. Remember, PREVENTION is the key to disease management. Reduce the inoculums levels in the winter! Do not be one of those growers calling to ask what is causing all the dead shoots in August after a wet spring! You can ignore BOT, but it certainly will not ignore you!
Growers experiencing heavy Alternaria infection pressure should consider side hedging or heavy hand pruning to open the row centers for better airflow. Alternate middle basin irrigation should also be considered. Growers report major reductions in Alternaria with subsurface drip but system monitoring and maintenance must be a priority for success.

Eutypa Control in Apricots and Cherries

By Bill Coates and Maxwell Norton, UC Cooperative Extension

Apricots and cherries should be pruned after harvest in July and August. Pruning wounds made in the fall and winter are susceptible to infection for up to 6 weeks. Pruning in July and August would be sufficiently resistant. If you have not pruned yet, and with rain becoming more likely, you may want to wait till late winter or even just prior to bloom when spore levels are much lower.

Drip Irrigation Scheduler for Grapes Available

Tulare County Farm Advisor Bill Peacock has developed a simple to use program for scheduling drip irrigation in grapes. The scheduler was prepared using Excel. Daily irrigation requirements are presented both as gallons per acre and gallons per vine. More information is posted at **http://cetulare.ucdavis.edu/Viticulture** where you can request the spreadsheet be e-mailed to you.

Fall Spray Controls Prune Aphid the Next Season

By Franz Niederholzer, Carolyn Pickel, Rich Buchner, and Bill Krueger, UC Cooperative Extension

Summary: In three years (2003-2005) of University of California research, a fall pesticide spray consistently controlled plum aphids (leaf curl plum aphids and mealy plum aphids) the following year, providing an option to replace the dormant spray for aphid control. Options for peach twig borer and scale control are discussed.

The traditional dormant spray in prune orchards controls several key orchard pests including peach twig borer (PTB), San Jose scale (SJS), and plum aphids. However, dormant orchard spraying is increasingly regulated due to recent findings of dormant-season pesticides (diazinon, chlorpyrifos and others) in surface waters. If use of the dormant spray is eliminated or further regulated, prune growers have limited options for integrated pest management (IPM) of plum aphids. Registered, effective pesticides for aphid control (Asana®, diazinon, etc.) are broad-spectrum materials (non-selective poisons) that when sprayed in-season can harm beneficial insects that provide natural (and free!) spider mite and SJS control. To increase prune/plum pest control options, University of California researchers and farm advisors began to field test fall (late October – November) spray timings for aphid control. Both speed sprayer and handgun, singletree trials were conducted. Low rates of labeled pesticides (Asana®, Imidan®, diazinon and/or Actara®) were tested. Oil was not included with pesticide treatments, as previous studies showed it did not affect aphid control, and use of oil is incompatible with zinc sulfate, a foliar nutrient commonly applied in the fall. In all three years of this study (2003-2005), fall pesticide applications gave excellent plum aphid control the following year. There were distinct differences between pesticide materials (see Table 1) with the more persistent materials were, more effective for aphid control. In Fall 2005, at least three large scale grower tests using Asana® (totaling over 1000 acres), produced effective aphid control in spring 2006.

Based on these consistently positive results, prune growers can add a fall spray to their list of effective options for plum aphid control. This spray timing is very effective on the most important pest in plum/prune production. Fall spraying is generally easier to plan due to better weather conditions and could become the preferred spray timing for orchards on heavy ground where orchard access is often difficult during January and February.

While the fall spray has not yet been shown to be a complete dormant spray replacement, there are other effective options for PTB that allow growers to avoid spraying in the full dormant season (January and February). Effective PTB control practices that compliment a fall spray for aphids include a bloom spray or in-season spray with materials that do not harm beneficial insects and mites. These materials include B.t. (Dipel®, Javelin®, etc.), Intrepid ® and Success®.

What about scale? Because coverage is so important in scale control, delayed dormant timing is still the best option for scale control. However, in our experience, few orchards in the Sacramento Valley have enough scale to justify spraying. A dormant spur sample is the best way to check orchard scale levels. When results of this simple test show a need for scale control, high rates of oil (4 gallons/acre) can give good control of low to moderate SJS populations when applied in the delayed dormant period. An effective pesticide (Supracide®, diazinon, Lorsban®, Seize®, etc.) should be added to the tank with a dormant oil if high scale populations exist. If the dormant treatment is skipped and scale is noted in spring, an in-season spray with oil and/or Seize® can give good scale control if necessary.

Table 1. Plum aphid control materials, rates, and relative control results when sprayed once from mid-October through November.

Material	Rate/acre	Aphid Control
Asana®	3*-4.8oz	Excellent
Diazinon	2 pints	Fair - Good
Imidan®**	2.125-4.25 pounds	Good -- Excellent
Actara®	3 oz	Good -- Poor

***Below labeled rate.**
****Imidan was tested because it breaks down quickly in water and will have less impact on surface water quality and aquatic life.**

In addition, we have been estimating the timing of egg hatch of both MPA and LCPA from examination of aphid eggs collected at regular intervals from prune orchards in the Winters area in 2004-05 and 2005-06. Before egg hatch can take place, aphid eggs must first complete an obligatory phase of overwintering diapause that is determined by chilling, in much the same way that prune buds require chilling to terminate dormancy. For MPA, we estimated that diapause was completed around Jan. 24 in 2005, but somewhat earlier around Jan. 9 in 2006. We found sufficient eggs of LCPA in

only one of these two years and estimated the end of diapause to be Feb. 2 in 2006, later than that for MPA. The time taken for eggs to hatch after diapause is completed depends on the accumulation of sufficient temperature above a threshold, for egg development to reach the thermal requirement for egg hatch. The threshold temperature for development for both aphids is 37-39oF and preliminary data suggest that eggs of MPA have a higher thermal requirement for egg development than eggs of LCPA. An earlier termination of diapause coupled with a higher thermal requirement for egg hatch in MPA, with the reverse being the case for LCPA, results in a very similar timing of egg hatch for both aphid species. We estimated egg hatch to be around Feb. 17 in 2005 and Feb. 12 in 2006 for MPA and Feb. 12 in 2006 for LCPA.

These investigations will help us to clarify the windows of activity of prune aphids both in the fall before egg laying begins and also in the spring after egg hatch. This information will be very valuable for understanding the options for timing of either pre-dormant or delayed dormant control treatments for aphids as alternatives to dormant sprays.

Almond Lower Limb Dieback Update

By Roger Duncan, UC Cooperative Extension

Over the past couple of years, many orchards in California have been affected by a disease we are calling "lower limb dieback." Padre and Butte are affected most severely. Symptoms begin to show in late April or May as leaves on small, lower limbs turn yellow. Over a period of weeks, the limbs become girdled from enlarging cankers and die. Symptoms progress through most of the summer.

Two canker-forming fungi, Botryosphaeria dothidea and Phomopsis sp., are consistently isolated from cankers on dying limbs. However, we still cannot say for certain that these fungi are the primary causes of the disease as they may come in as secondary invaders. We have also isolated these fungi from dead limbs in nearby walnut orchards as well as landscape trees like cedar and redwood. We have noted that these fungi sporulate profusely on these alternate hosts but do not appear to sporulate nearly as much on infected almond wood. I suspect most almond infections are from spores that are blown in from outside of the orchard.

Last spring I tried to reduce lower limb dieback in a badly affected orchard by applying fungicides from petal fall through early June. Unfortunately, these spring fungicide applications had no effect on reducing symptoms last year. Based on reports out of Europe that Phomopsis infections may occur primarily in the fall, we conducted field trials in three orchards testing fall treatments. In two orchards, the growers applied copper hydroxide (Kocide® DF at 12 lb. per acre) or liquid lime sulfur (15 gallons per acre) in mid-late October. In a third orchard, several other treatments were tried in smaller plots using a handgun sprayer. These treatments included Kocide® DF applied in October and December, liquid lime sulfur in October and December, Pristine® fungicide (14.3 oz per acre) applied every two weeks from October 14 through November followed by an early December Kocide® application, NutriPhyte P (0.5 gallons per acre), and PlantShield®, a commercial formulation of Trichoderma harzianum, which is a biological fungicide.

Results. The bottom line is that we saw no significant reduction in lower limb dieback symptoms this spring by any of the fall treatments in any of the orchards. This was, of course, very disappointing. There may be a few explanations for our poor results. First, I observed that many old cankers that had "died out" last summer reactivated this spring leading to more limb death. Of course, a fungus that survives from one season to the next inside of a limb will not be affected by a fungicide spray. Another possible reason we did not reduce lower limb dieback significantly with the fall treatments is because the two fungi can sporulate and infect new wood at a very wide temperature range. Sporulation of Phomopsis amygdali pycnidia occurs from 34ºF – 100ºF and infection can occur from 41ºF – 97ºF, as long as there is moisture present. This means infection could potentially occur any time from the first rains in the fall through the last rain event in the spring. There is no practical way to protect trees with standard fungicides for a period of six to seven months or longer. It is also possible that there is another primary cause of the disease we have yet to discover.

One out of the three cooperating growers pruned out all the dead and diseased wood in his orchard last fall. This orchard had significantly less dieback this year than last year and also much less than the other two orchards I worked in. I assume this is because the grower removed limbs containing old cankers, which would have reactivated this spring. Management of this disease may require removal of diseased limbs in combination with multiple applications of a long residual fungicide like copper. It may be best to prune out the wood during the summer while it is easy to identify affected limbs. We will continue to work on this problem and hopefully come up with clearer management suggestions.

Just Published

Seasonal Guide to Environmentally Responsible Pest Management Practices in Prunes

This handy full-color guide takes you through the year based on the stages of prune tree growth with an easy to understand approach to environmentally friendly pest management in prunes. It indicates the best times to monitor specific pests and, when available, gives treatment thresholds and appropriate pesticides to use. Based on research from UC Extension Specialists and the Integrated Prune Farming Practices project. 12 pages #21624 $7.00

Cover Crops for Walnut Orchards

Cover crops can provide many benefits in orchards and vineyards and have seen increasing use in recent years. This new handbook outlines a step-by-step process for success including suggested cover crops, orchard factors to consider when choosing a cover crop, how and when to plant, and how to manage the cover crop. 19 pages
21627 $10.00

Seasonal Guide to Environmentally Responsible Pest Management Practices in Peaches and Nectarines

This handy full-color guide takes you through the year based on the stages of peach tree growth with an easy to understand approach to environmentally friendly pest management in peaches. It indicates the best times to monitor specific pests and, when available, gives treatment thresholds and appropriate pesticides to use. 8 pages
#21625 $7.00

The following **Pest Management Guidelines** have been updated and are available for a small charge at the Cooperative Extension office or as a free download:

3433 Apricot
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3433
3437 Cranberries
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3437
3440 Cherry
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3440
3451 Nectarine
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3451
3454 Peach
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3454
3432 Apple
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3432
3447 Fig
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3447
3464 Prune
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=3464

Also, free on-line:

8207 Ferrisia gilli: A New Mealybug Pest of Pistachios and Other Deciduous Crops
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=8207
8202 Orchard Floor Management Practices to Reduce Erosion and Protect Water Quality
http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=8202