COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

July 2009

Ag Technology Field Day

July 22, 2009
9 am – 12 noon
(Registration begins at 8:30 am)

Modesto Junior College Farm
4554 Beckwith Avenue, Modesto

Sponsored by UC Cooperative Extension, Natural Resources Conservation Service and Modesto Junior College

The Ag Technology Field Day features demonstrations of tools that will help growers use irrigation water more efficiently, lower dust emissions, reduce pesticide use and take advantage of natural pollinators.

DRIP AND MICRO SPRINKLER IRRIGATION MEETING

TUESDAY AUGUST 4, 2009
7:30 AM – 4:30 PM
MODESTO AG CENTER
3800 CORNUCOPIA WAY
MODESTO, CA 95358

HOSTED BY:
EAST STANISLAUS RESOURCE CONSERVATION DISTRICT, UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION, STANISLAUS, AND THE USDA – NRCS MODESTO SERVICE CENTER

MEETING AND LUNCH ARE FREE IF YOU RSVP BY FRIDAY JULY 31, 2009!
PRE-REGISTRATION FOR THE MEETING IS EASY !!!

CALL	(209) 491-9320 X 122
E-MAIL	MELANIE.FISHER@CA.NACDNET.NET
OR FAX	(209) 491-9331

Disease Digest: Lower Limb Dieback of Almond

By: David Doll, UC Cooperative Extension Farm Advisor, Merced County

Crops Affected: Almond, Predominantly found on Padre and Butte, but also found on many other varieties including Nonpareil, Fritz, Carmel, Wood Colony, and Mission.

Causal Organisms: Unknown, but high isolation frequency of *Botryosphaeria* spp. and *Phomopsis* spp.

Lower limb dieback (LLDB) is an emerging problem within many almond orchards throughout California. Observations of orchards with LLDB occur independent of soil types, irrigation systems, varieties planted, and planting spacings, while typically affecting orchards that are in their 8th leaf or older.

The problem tends to be associated with smaller diameter branches in the lower canopy of orchards. Often enough, however, the problem extends to larger diameter branches, causing branch loss that can extend to 10 feet or more from the ground. Symptoms include wilted, yellow leaves that eventually fall from the tree. Bark removal will reveal a brown canker with little or no gumming that usually does not completely girdle the branch. The fungal canker can be observed on the top side of the affected branches, which is often found proximal to the yellowing leaves. Often, the canker is associated with a dead spur or small branch. The fungus appears to move up the branch to the point of attachment with the main scaffold, but does not appear to enter into the main scaffold. The first appearance of symptoms has been reported in April, with shoots continuing to collapse throughout the summer. Branch collapse is often noticeable about a week after a hot spell in which the evapotransipiration rates are very high.

Isolations made by Themis Michailides (UC Extension Plant Pathology Specialist) from almond trees in orchards affected by LLDB have identified two commonly isolated genera of fungi, *Botryosphaeria* and *Phomopsis*. Sampling of diseased limbs from 10 orchards in 2005 (Glenn, Madera, and Stanislaus Co.) and 18 orchards in 2006 (Butte, Colusa, Fresno, Glenn, and Kern Co.) identified *Botryosphaeria* spp. and *Phomopsis* spp. from 52% and 56% of the isolations made, respectively. Isolation of these pathogens was higher in late summer/fall than in spring/early summer. Interestingly enough, in the Sacramento Valley, fall isolations frequently occurred from both limbs with AND without symptoms.

Corresponding pathogenicity tests of isolated fungi on thrifty and unthrifty trees indicated that the isolates of *Botryosphaeria* spp. and *Phomopsis* spp. can cause disease on almond trees. It was also found that the isolates of *Botryosphaeria* spp. tend to be more virulent than *Phomopsis* spp. There is some uncertainty of these fungi being the true cause of the disease, however, as they have been considered to be fungi that colonize weak tissues that are predisposed from some other stress.

Several fungicide trials by Roger Duncan (UCCE Stanislaus) and Bruce Lampinen (UC Extension Pomology Specialist) have consisted of spring and fall applications of several fungicides. Fall (October – December) applications of copper hydroxide, liquid lime sulfur, Pristine©fungicide, Nutriphyte P© (0.5 gallons per acre), and Plant Shield©, a commercial formulation of *Trichoderma harzianum*(a biological control agent), did not lower the incidence of LLDB the following year. May applications of Captan 80 WDG©, Pristine©, and Agri-fos©, all applied with a bark penetrant, also failed to reduce LLDB symptoms. These trials indicate that chemical control for LLDB is either not possible or has not been identified.

Orchard water management may play a role in the incidence of LLDB. Through the use of soil moisture monitoring systems and a pressure chamber, research by Bruce Lampinen has demonstrated that orchards with LLDB frequently are over-watered in the early season (April-June). Research is ongoing, but evidence suggests that excessive water in the early season can prevent proper root growth and development, which would lead to increase tree stress during periods of high evapo-transpiration. This stress would lead to the reduction of tree resources being sent to branches of the lower canopy, weakening these branches, and allowing invasion by the above mentioned fungi. Growers with LLDB affected orchards should evaluate their water management practices to prevent over-watering during the early season.

Other orchard problems may also contribute to LLDB. Hull rot, scale infestations, and herbicide drift can damage the lower branches and kill spurs, providing an entrance for fungi. These problems occur frequently on younger trees (less than 8th leaf), before the onset of LLDB, which suggest that they may predispose the tree to LLDB. Therefore, it may be

important for growers to implement orchard practices that will reduce damage to the lower canopy. Then again, any practice that reduces tree damage should be adopted to increase orchard longevity.

Until the true cause of LLDB is determined, it is advised that growers prune out infected limbs. Work done by Roger Duncan showed a reduction of LLDB in orchards in which affected limbs were removed, and suggests that this is currently the best way to reduce LLDB. Affected limbs should be removed as soon as possible by pruning 4-6" beyond the canker margin to ensure complete removal of the fungal pathogens. It is not advised to make major cuts on scaffolds or large branches to ensure a full 4-6." Aggressive rouging out of infected branches during the summer months may reduce inoculums levels and prevent infections in the fall or dormant period.
For more information on LLDB, please check with your local UC Extension office or the website of the California Almond Board.

July Leaf Sampling: Sampling Today for 2010's Fertilizer Budget

By: David Doll, Farm Advisor, Merced County UCCE

Leaf analysis is a useful tool in determining deficiencies, toxicities, and future nutrition needs of almond trees. Simply stated, it is one of the most important annual samplings that should occur for every block within the orchard.

Leaf samples should be pulled in July, as this is the period in which the critical values established through UC experimentation have been developed. This period was selected by researchers due to the reduction of nutrient concentration variability among the leaves.

Sampling should be distributed in a regular pattern across the block, with fully expanded leaves pulled from non-fruiting spurs on branches at least 6 feet high. About 100 leaves are needed for each sample. Leaves should be picked from trees of the same variety, rootstock, tree age, and growing on the same soil type. Label the samples so the sampling location is known, and keep cool until they are sent off to an analytical lab.

The results from the laboratory can be compared to the table below. If a deficiency has been detected, possible remediation can occur in the fall after harvest, dormant season, or early spring depending on the nutrient and level of deficiency. Leaf concentrations of major elements (nitrogen, phosphorous, and potassium) can be used along with kernel production per acre to determine the following season's nutrient budget. Dr. Patrick Brown (UC Davis) has developed an online model to help determine next year's nitrogen and potassium budget. It is located at http://ucce.ucdavis.edu/rics/fnric2/almondNKmodel/almondNKmodel.htm

Table1: Critical nutrient levels (dry-weight basis) in almond leaves sampled in July.
(Source: UC Almond Production Manual, Publication 3364, 1996)

Nitrogen (N)	
Deficient below	2.0%
Adequate	2.2–2.5%
Phosphorus (P)	
Adequate	0.1–0.3%
Potassium (K)	
Deficient below	1.0%
Adequate over	1.4%
Calcium (Ca)	
Adequate over	2.0%
Magnesium (Mg)	
Adequate over	0.25%
Sodium (Na)	
Excessive over	0.25%
Chlorine (Cl)	
Excessive over	0.3%
Boron (B)*	
Deficient below	30 ppm
Adequate	30–65 ppm
Excessive over	300 ppm
Copper (Cu)	
Adequate over	4 ppm
Manganese (Mn)	
Adequate over	20 ppm
Zinc (Zn)	
Deficient below	15 ppm

*Critical values for boron deficiency and toxicity are currently being revised. Hull boron >300 ppm is excessive. Leaf sampling is not effective to determine excess boron.

Managing Grapevine Canker Diseases

Stephen Vasquez and George Leavitt, UC Cooperative Extension

As harvest begins to wind down, growers are starting to decide whether their canker infested 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 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. 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. Prepruning 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 infested wood-dead arms and cordons-from vineyards will help reduce the inoculums 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.

Long-term Strategies
When vines and yields begin to decline significantly, ownrooted 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. 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 caners 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.htm

University of California Cooperative Extension
VARIETY DISPLAY AND RESEARCH UPDATE SEMINAR SERIES

8:00 am – 9:00 am **Variety display by stone fruit nurseries, breeders and the USDA**
9:00 am – 10:00 am **Research Update Topic and discussion in the field**

Mark your calendars for these dates:
Friday, July 31
Friday, August 21

Topics to be discussed will include: Mechanical Blossom Thinning, Stone Fruit Rootstocks, Water Management, Pedestrian Orchards and Fruit Quality

Location: Kearney Agricultural Center, 9240 S. Riverbend Avenue, Parlier, CA 93648
For more information call: Brent Holtz (559) 675-7879, Ext. 209

New Pomology Farm Advisor for Tulare County

Dr. Elizabeth J. Fichtner has accepted the position of Horticulture Advisor - Orchard Crops and Systems, serving Tulare County. Dr. Fichtner earned both her MS and PhD degrees in Plant Pathology and Soil Science at North Carolina State University, Raleigh, NC. She earned her Bachelors degree in Plant Science at Cornell University, Ithaca, NY. Elizabeth has most recently been working as a research scientist with the Department of Plant Pathology, UC Davis. Elizabeth began on July 1st and we welcome her to the tree crop community.

Drosophila suzukii or Spotted Wing Drosophila (SWD)

Maxwell Norton, UC Cooperative Extension

Drosophila, or "vinegar flies" are common and can build up rapidly wherever there is decomposing fruit. Several species are common in CA. All of us learned about *Drosophila melanogaster* in biology class when we studied basic genetics. Until now, all Drosophila species feed and lay eggs only on damaged or decaying fruit. We are now observing a species that is able to insert eggs into sound fruit. Significant damage has been observed in cherries, raspberries, strawberries, blueberries, possibly nectarines, and possibly other fruit in various locations in the state.

This new species is *Drosophila suzukii*, a native of Asia. CA Dept of Ag is currently giving it a common name of Spotted Wing Drosophila. It was wrongly named the cherry vinegar fly for a short time. The name is indicative of a large dark spot at the rear end of the wings in the males only. Large spots are rare in Drosophila and are present only in a few species. If you trap the drosophila you may get more than one species. Look, using a hand lens at the wings for the spot. There are pictures on our web site **cemerced.ucdavis.edu** and on other web sites. Many will still have the old "cherry" name.

SWD has several generations per year and one generation can turnover in 12 days at 79F. The female adult lays 2-3 eggs per fruit and they hatch in 1-3 days. Because it is so widespread, CDFA and USDA are not proposing at this time to regulate nor to eradicate SWD. Growers will have to incorporate a management program into their exiting pest management system.

There is a fear that SWD may infest grapes. A UC Davis scientist put some table grapes into a vial with SWD and they oviposited many eggs into the fruit. There is also a field report from the coast that wine grapes may have been infested with SWD over the last two seasons but we are trying to confirm that.

We recommend that all cherry, cane berry, blue berry and grape plantings be monitored for SWD. Other thin-skinned fruits such as nectarine and plum should be monitored for damage. Fruits become attractive to SWD as they accumulate sugar. We do not know what the sugar threshold is to trigger egg laying in the fruit. A variety of liquid bait traps seem to work well. Bill Coats in our San Benito office has been using simple fly traps from the hardware store with apple cider vinegar. The liquid stays fairly clear, making it easier to see the wings. Change the trap often to prevent the SWD from being stained dark. A commercial bait, GF-120 from Dow is very effective and is available from your local ag chemical dealer. Check the label status for your crop before usuing.

No chemical treatments for SWD have been thoroughly tested. A commercial bait-insecticide mixture, GF-120 Naturalyte, from Dow is effective on several fruit fly species, and may work for controlling SWD. Preliminary test with GF-120 in tunnel-grown raspberries and central Coast sweet cherry orchards showed some success, but more testing with this and other materials is needed. The bait and insecticide combination is "squirted" on each tree or at intervals down the berry row. It is a thick mixture that should be applied to the leaves but not to the fruit because of its poor taste and possible toxicity. The control programs for walnut husk fly and olive fly may provide models to start from. Review the label restrictions carefully with your PCA.

If you try this or any other program, please contact your local Cooperative Extension Farm Advisor and tell us how it worked.

UC Kearney Agricultural Center
Grape Day 2009
Tuesday, August 11, 2009
9240 South Riverbend Avenue (SE Corner of Riverbend and Manning Avenues)
Parlier, CA

7:00 a.m. - 12:00 p.m.
$10 Includes meeting, proceeding and refreshments

7:00am Registration and refreshments

7:30am Welcome, meeting announcements and groups organized

Tram Field Tour :

8:00am Dong Wang - Soil fumigants for vineyards

8:30am Andrew McElrone and Larry Williams - Heat pulse sensors for monitoring grapevine water use

9:00am Jim Wolpert - New wine grape varieties for the San Joaquin Valley

9:30am Kurt Hembree and Stephen Vasquez - Post-emergent herbicide management in vineyards

10:00am Peter Cousins - Breeding and evaluating improved root-knot nematode resistant rootstocks

Seminars

10:30am Mike McKenry - Movento; more than an insecticide

11:00am Doug Gubler - New findings in grapevine powdery mildew management

11:30am Roger Baldwin - Comparing multiple approaches for controlling pocket gophers in vineyards

12:00pm Matthew Fidelibus - Grape maturity affects yield, quality, and sensory properties of DOV raisins

CCA and PCA Continuing Education units have been requested
Fill out and mail registration form:
Company: _____
Phone: _____
Address: _____
City: Zip: _____
Attendee(s) Names:

Fee includes meeting and proceedings: $10.00
Meeting and Proceedings: X $10.00/person = _____ $ _____
Check Number: _____ Amount enclosed $_____

Checks Payable to: UC Regents Mail payment and registration to:
KAC Grape Day, 1720 S. Maple Avenue
Fresno, CA 93702