COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

June 2008

Field Demonstrations:
Using the Pressure Chamber to Manage Irrigation and Diagnose Problems

Monday 9 June 2008

(Two locations)

Dave Doll, Maxwell Norton & Dan Rivers will demonstrate the use of pressure chambers "pressure bombs" as management tools and for diagnosing problems with tree and vine crops.

10:00 a.m. Atwater Area - Fiorini almond and peach orchards on the S-E corner of Applegate and Atwater Jordan. In Atwater take the Applegate Exit (CHP and Super Target) and go south. Look for the UCCE sign on the left just as you pass Atwater Jordan Road.

2:00 p.m. Los Banos Area - Teicheira's almond orchard on Almond Drive, orchard is located about ½ mile west after turning left off of Ortigalita. From I-5 Take the Highway 152 exit towards Los Banos, Turn south on Ortigalita. Turn right onto Almond Drive (west). Look for the UCCE sign on the right after crossing the canal.

2008 Almond Irrigation and Hull Rot Field Meeting

Tuesday, June 24, 2008

Brent Holtz, Bruce Lampinen, and Jeff Hamel will present on hull rot disease management and irrigation for the 2008 season. Presentations will be held at J.M. Lasgoity Orchard - Rd 16 between Avenues 18 1/2 and 14

8:30 AM-12:00 Noon

Report Crop Damage Promptly

Maxwell Norton, UC Cooperative Extension, Merced County

Spring 2008 has been a spring of frost and wind damage. It is important that you report significant crop damage as soon as possible to your crop insurance agent and to the County Ag Commissioner (CAC). It is very important to report insured losses to your agent promptly to assure that you will receive full consideration for your loss. Never wait till after harvest to report a loss. Even if you are not sure – call anyway.

Letting the CAC know helps county and USDA officials document area-wide losses in the event that federal disaster assistance becomes available. These programs usually do not become available till a year or two later but they still have to be documented; doing so after the fact will be more difficult.

Can you trust the selection interview?

Gregorio Billikopf, UC Cooperative Extension

During a three-day workshop on agricultural labor management, presenters focused extensively on the selection of farm personnel. During the last day of the seminar, class participants were divided into groups and had the opportunity to work on their interviewing skills.

The assignment for each of the four groups was to first come up with a basic description of a farm operation and then consider effective interview questions. Each group would have the opportunity to interview four separate equipment operator candidates. The assignment required a ranking of each equipment operator from best to worst.

While these farm managers and mid-level supervisors prepared for the interview, I met with the four 'applicants.' It was clear to all that they were not applying for a real job, but were helping us out in the seminar. Two of the equipment operators had been lent to us by neighboring farmers while the other two were employees for the large agricultural cooperative where the seminar was held. I knew that one of these two men only drove a tractor to empty garbage bins and do other like assignments at the plant. As I met with all four operators, I suggested to them, "Don't be afraid to have fun here, and play the role of someone applying for a job. Feel free to make up any information you want to."

When the interviews were concluded, one candidate rose as the clear choice among three of the four groups, and the second choice of the remaining group. All four groups quickly and independently came to the same conclusion about the man who drove a tractor mostly to empty the garbage in the plant, and placed him at the bottom of the list as the least desirable. So much for my instructions "To have fun," I thought. This candidate had been candid about his experience.

The first surprise came when I asked the seminar participants if now that they had ranked the equipment operators, if they would like to know how the equipment operators ranked each group. As I have carried out this little experiment in many nations over the years, it is clear that while farmers are interviewing applicants, these applicants are in turn evaluating the farm employers, too.

The groups that score well with applicants tend to: 1) have all members of the interviewing team ask questions; 2) allow the applicant to speak more than the interviewers; 3) ask difficult questions but allow applicants to save face if they do not know the answer; 4) listen to and attend carefully to the applicant rather than allow themselves to be distracted or get bored; 5) have a sense of humor, while being respectful; 5) encourage applicants to ask questions; and 6) seem to be united in purpose and not at odds with each other.

While the interviews were taking place, another group of class participants were outside developing a course to use as a practical test of driving skills. They had situated bins in the place of fruit trees, and had spaced them in rows as if we were out in an orchard. Candidates were asked to back their tractor and implement down the road between orchard blocks, and then back up into a specific row.

The tractor operator who had refused to exaggerate his experience for the role play did a better job than any of us expected. The real surprise came, however, when the second applicant who had been provided by the farm cooperative had his turn. He had been the clear choice in the morning, after the interviews. It turned out, he was having a great deal of trouble maneuvering the tractor without hitting the bins that represented fruit trees.

The cooperative had not told me that he was their truck driver, rather than an orchard equipment operator. Yet he had managed to come across so well in the interview that most groups had selected him as their first choice. I began to look at the faces of disbelief of the participants. "It must be the tractor," some suggested. The tractor the cooperative had provided was not very smooth, but both cooperative employees had had some experience with it and so chose to drive that tractor rather than a second tractor provided by one of the neighboring growers.

One of the axioms of employee selection is that interviewers look for information to help prove their perspective, and tend to discard information that contradicts it. "We want to see him drive the other tractor," they suggested. The driver did just as poor a job using the second tractor.

Practical tests are a much better predictor than interviews, of effective employee performance on the job. For more ideas on designing a selection process using practical tests contact the author at gebillikopf@ucdavis.edu or download chapters two and three of the book Labor Management in Agriculture: Cultivating Personnel Productivity, found at http://www.cnr.berkeley.edu/ucce50/ag-labor/7labor/001.htm

Gregorio can be reached at: 209/525-6800

Considerations in Planting Olives for Oil

Joe Grant, UC Cooperative Extension, San Joaquin County

It is obvious from the number of new plantings around the northern San Joaquin Valley that interest in growing olives for oil is increasing. Most new orchards are so-called "super-high-density" (SHD) plantings of oil varieties Arbequina, Arbosana and Koroneiki. Because of their low vigor and high productivity, these varieties are well suited to the close spacings (4'X12' or 5'X13', or 600-900 trees/acre) of SHD plantings. A few "high-density" plantings (200-350 trees/acre) of other more vigorous (mostly Italian) oil varieties have also been established.

The expectation that this new crop will be successful is based on several assumptions:

- Ability to harvest with machines will keep harvest costs low
- Highly precocious and productive oil varieties will allow for early return on investment
- California can establish a reputation as a producer of high quality oil that will command premium prices
- Marketing efforts will induce US consumers to use more olive oil or shift their consumption from imported oils (almost all oil used in the US comes currently from Italy) to higher quality California oils

Considerations for deciding whether this new crop is right for you can be broken down into four areas:

Economics. Most recent cost studies peg the cost of establishing SHD olive orchards at roughly $10,000/acre net accumulated cost through the third year when production starts. SHD plantings under good management reach full production by the 5th year. Grower returns are dictated by production costs (around $1,500/acre per year, excluding overhead and capital recovery costs), tonnage (5-6 tons/acre are reasonable), oil yield (40-45 gallons/ton for Arbequina), price of the oil (current bulk price is $24-30/gallon), and the costs of milling, bottling and sales. As stated above, long-term economic feasibility will depend heavily on the prices consumers are willing to pay for a differentiated product. A 2007 cost study for the northern San Joaquin Valley is available at http://ucce.ucdavis.edu/files/filelibrary/2161/43379.pdf.

Climate/Weather. Olives are sensitive to cold. Areas prone to frost during bloom (late April-early May) or freezing temperatures (<29°F) at harvest time should be avoided. Winter temperatures below 25°F will kill young olive trees and branches of mature trees. Temperatures below 22°F can kill mature trees. Cool/wet or dry/windy conditions during bloom can reduce pollination and fruit set.

Soils. Olives are adaptable to a wide variety of soil conditions, but do not tolerate "wet feet". Avoid heavy clay soils. Successful orchards have been established on soils as shallow as 2 to 3 feet, but the soil must be well drained. "The best" soils needed for other tree crops should be avoided because they can induce excessive vigor and lower fruit/oil production in olives. Sites with a high water table should have at least 4 feet of year-round saturation-free rooting depth. Olives tolerate a wider range of soil pH (5.0 to 8.5) and higher levels of soil salts than most tree crops but do best in pH 6.5 to 7.5 soils with low salts. High soil boron (>2ppm in saturated paste test), sodium (SAR >15) or chlorides (>10-15 meq/l) can cause problems. Sites with a history of Verticillium wilt in susceptible crops like tomatoes, peppers, melons (and, in fact, most non-grain field and vegetable crops) should be avoided. At a minimum, soil from such sites should be tested for the presence of Verticillium propagules.

Irrigation Water. Young developing olive trees need full irrigation to promote rapid growth until trees fill their allotted space. Mature orchards require less water than other tree crops. Recent studies have shown good production and oil quality can be achieved under controlled deficit irrigation at around 50% ET, or about 2 acre-feet or water per year. Orchard well capacity and irrigation system design must be adequate to meet peak orchard demands for water. Irrigation water for olives should have boron levels under 2 ppm, total salts under 3 dS/m (=mmhos/cm), and sodium under 3 meq/l and chlorides less than 345 ppm.

Terrain. In hilly terrain, avoid planting olives in low-lying areas subject to water-logging and frost. Such areas can also easily impede or prevent harvest machinery, even with a small amount of rain at harvest time. Most harvesters can not self-level on side slopes over 20%. Whether on flat or sloping terrain, harvest operations also require sufficient turn-around space at row ends and flat and conveniently located fruit dumping or staging areas. Check with your harvest operator when planning olive orchards, especially in hilly terrain.

Using Sunflowers in the Control of Oriental Fruit Moth in Peaches

Dan Rivers, Staff Research Associate, UC Cooperative Extension, Merced

With increasing regulation of organophosphates and pyrethroid insecticides and the demonstrated success of Integrated Pest Management (IPM) practices, an old biological approach to managing Oriental fruit moth (OFM) in peaches is being tried here in the Central Valley. Many of you have heard Walt Bentley talk about this approach at growers' meetings and you may have seen sunflowers planted (as well as wild) along orchards here in Merced County. Sunflowers are readily infested with the sunflower moth *(Homeosoma electellum)* which serves as an alternate host to an OFM parasitoid, *Macrocentrus ancylivoris*. This parasitoid wasp lays its eggs in larvae of both OFM and the sunflower moth (and PTB), emerging and destroying the host larvae when the larvae begin to pupate. OFM overwinter in leaf litter in a pre-pupal form, triggering emergence of the wasps early when no food source is available and disrupting this cycle of biological control. Sunflower moths, however, overwinter in the soil as larvae and pupate in the spring when *Macrocentrus* can emerge, move into the orchard and find OFM.

Small plantings of sunflowers are all that is needed but this is not without challenges. Sunflowers need full sun and ample water to grow. They will not do well at the ends of rows or between trees. We have found success planting them a foot apart in a row or two along the edge of the orchard in the road right-of-way, leaving room for orchard equipment but staying close to water. We used Russian black oilseed sunflowers that grow to about three feet tall with heads about 8-9 inches in diameter. Now, wild sunflowers may function similarly but it is thought that the smaller heads of the wild sunflowers are less attractive to the moths. Our sunflowers were planted with a one-row, garden seeder. A row of drip tape (flow rate of 0.45 gpm/100 feet and 12-inch emitter spacing); teed off the orchard irrigation system was enough to do two rows spaced 20 inches apart. To germinate the seed (in coarse sandy soil), the tape had to be moved, alternating between the two rows, then left in the middle once the seedlings emerged. The plantings did require some hand weeding.

This year we planted one row (1/4 mile long) in May and will make two more consecutive plantings roughly every six weeks. We will soon augment any natural population of *Macrocentrus* with an orchard release of laboratory-reared wasps. Walt says this is not a stand-alone treatment. He says that a mating disruption treatment in early spring (hand-applied pheromone dispensers or sprayable pheromone) together with the staggered sunflower plantings and wasps should give good control of OFM, once the wasps are established. This control should be seen in a wide area around the sunflower plantings and even in the later maturing peach varieties. We will keep you posted.

Disease Digest: Verticillium Wilt of Pistachio and Almond

David Doll, UC Cooperative Extension, Merced County

The high heats of late spring/early summer can bring upon the onset of wilts. Verticillium wilt, a common occurring wilt, is caused by the fungus *Verticillium dahliae* Klebs. *V. dahliae* is widespread in soils throughout the county, with susceptible hosts in a large number of perennial and annual crops. Within perennial crops, almond and pistachio are susceptible hosts.

Evidence of verticillium wilt of trees is the sudden wilting of foliage on one or more branches. Leaves turn light tan and die, and often remain on the tree. In some cases, particularly in pistachio, symptoms develop slowly over several years causing a thinning of the leaves and a corresponding loss in yield as the fungus progresses up the branch. Internally, the xylem wood turns dark, and a cross section will show a ring of discolored tissue. This darkened tissue will extend down the affected scaffold to the point of origin within the root system. Several scaffolds of the tree may be involved if the pathogen infected a large portion of roots.

The fungus survives in the soil within survival structures known as microsclerotia. It enters the trees through the roots, infecting the xylem tissues of the plant. Upon infection, the fungus produces a dark pigmented substance that clogs the xylem tissues, preventing the upward flow of water to the scaffold branches. When the affected branches or leaves demand more water than it can receive due to the blockage, it collapses. Cool springs and wet soils favor disease development. The fungus is eliminated from the above-ground portions of the trees during the hot weather. The fungus may survive within the root and reinvade the upper part of the tree, but it is thought that repeated occurrences of wilt are caused by new infections each year.

Historically, verticillium wilt is the most destructive disease of pistachio. Trees of any age can become infected and die. Resistant rootstocks have been developed and are the best defense against verticillium wilt. Severely affected trees should be removed and replaced with resistant rootstocks. Within almond, young trees within their 2nd and 3rd leaf are the most susceptible to tree loss. All almond rootstocks and varieties are susceptible. In sites of high disease pressure, almond trees may completely collapse and need to be replaced. Losses in almond, however, are low as trees tend to recover and replacement is not needed. Although strikes may be visible, rushing out to remove affected branches is not advised. These branches will have no further impact on the tree and will be removed during annual pruning.

Criteria for site selection for pistachio or almond should include crop history and an assessment of the inoculums level in the soil. Locations with a crop history of tomato or cotton tend to have higher populations of *V. dahliae* as these crops are susceptible hosts to the fungus. If populations of *V. dahliae* are found, a cover crop of a non-host plant, such as corn, barley, or wheat, should be grown for two years. Pre-plant fumigation may reduce microsclerotial populations within the soil, but will not eradicate the fungus. Interplanting agronomic crops that are susceptible to *V. dahliae* should be avoided.

Reduction of tree stresses and maintaining of tree health may reduce the occurrence of verticillium wilt. By applying proper irrigation and nutrients, severe cases of verticillium wilt may be avoided. If any questions arise, please don't hesitate to contact me. I am always available to visit with you about your operations.

Making Money Growing Prunes in 2008

Franz Niederholzer, UC Farm Advisor, Sutter/Yuba Counties

If I were a grower, here's what I'd do to give myself the best possible chance of making money growing prunes in 2008.

! **Set a good crop.** First things first. Some key things should be done (even though the weather is out of your hands). Manage nutrition and crop load the year before to favor a good return bloom. Rent bees. Spray fungicides as needed. Advance bloom or heat/cool orchard to avoid extreme temperatures.
! **Don't over crop the orchard.** Too much fruit on a tree looses money. Excess crop load reduces fruit sugar and increases dry away. The risk of branch dieback from potassium deficiency increases with crop load. Too much fruit weakens the tree. Weak trees risk a light crop next year. Strip and count fruit per tree in late April/early May to measure crop load. Shaker thin to remove excess fruit.
! **Irrigate as needed.** Fruit end-cracking occurs when water stressed trees are irrigated. The risk of end cracking is highest in May and June. To avoid end cracking, irrigate to meet tree water needs at least through June. Test soil moisture to find out if the orchard soil is drying out. To save drying costs (improve dry away) cut off water as early as possible before harvest. Cutoff date in your orchard will depend on soil conditions and irrigation system.
! **Fertilize to feed the crop and keep leaves on the tree.** Prune trees need potassium (potash) and nitrogen fertilizer to feed a good crop. The more fruit, the more fertilizer needed. Potassium nitrate sprays help avoid potassium deficiency. Prune trees need around 100 pounds of actual nitrogen per acre per good crop year. Take a leaf sample in July to see how well your fertilizer program is working.

! **Manage pests. Keep leaves on the tree to grow the sweetest, biggest fruit possible.**

a. Prune rust can defoliate trees resulting in less sugar and reduced dried fruit size. Look for prune rust spots once every week beginning May 1. Spray sulfur when the first rust spot is found. Repeat sulfur application if more spots are found. Don't apply sulfur if rust is not found in the orchard. [Sulfur can harm "good" mites that eat spider mites.]

b. Spider mites can also defoliate trees. Spider mite numbers can double in one week of 100oF weather. Look for spider mites once a week in the orchard beginning June 1. [Start scouting earlier if it is a dry spring.] Treat if significant mites are found and mite predators are absent.

c. Fruit brown rot can damage fruit as harvest approaches. A fungicide spray can help control fruit brown rot. Spray fungicide 1-2 weeks before harvest if wet weather is forecast or orchard has a history of fruit brown rot problems.

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Contact your local UC Farm Advisor for more information on these topics. Rust and mite scouting practices are described in detail in the Integrated Prune Farming Practices (IPFP) decision binder available from Cooperative Extension offices for just over $30.