COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA

TREE AND VINE NOTES

NOVEMBER 2003

UC Cooperative Extension
2003 North San Joaquin Valley
Cling Peach Seminar

10 December 2003
8:30-Noon
Service and Crows Landing Roads, Modesto
Stanislaus County Agricultural Center

Sponsored by UC Cooperative Extension and the Cling Peach Board

8:00 Registration and Coffee

- **8:30 Progress Report on Stanislaus County Research Trials**
  - Fumigation
  - Spray thinning
  - Bacterial canker research

  Roger Duncan, UCCE Farm Advisor, Stanislaus County
- **9:10 New Designs for cling orchards – thinking outside the bin**
  Maxwell Norton, UCCE Farm Advisor, Merced County
- **9:30 Managing labor more effectively**
  Gregory Billikopf, UCCE Farm Advisor, Stanislaus County
- **10:10 Break**
- **10:30 Cling Peach Board Business**
  - **Discussion of Industry Research Needs**
  - **Board Member Nominations**
- **10:50 Stone fruit nutrition and fertilization**
  Scott Johnson, UCCE, Pomology Specialist
- **11:20 Oriental Fruit Moth mating disruption tools**
  Janine Hasey, UCCE, Sutter & Yuba Counties

Noon : Lunch hosted by the Cling Peach Board

No attendance fee required
Handicapped accessible

GENERAL NOTES By Maxwell Norton

This fall has been too warm and too dry. Many will enjoy Thanksgiving dinner look out at orchards that are still foliated. Moisture levels in some orchards are quite low. If you plan on using and oil as part of a dormant spray program, be cautious and try to wait till after a rain. The warmer winters have been problematic for growers. Warm temps allow higher over-wintering populations of some pests. Whether this results in higher pest pressure in spring is uncertain. Of greatest concern is the encroachment of exotic pests like the glassy-winged sharpshooter into regions that normally would be too cold for this pest to survive. Let's hope for a very wet and very cold winter.

Shredding and Smoke by Brent Holtz, UC Cooperative Extension, Madera County

In the San Joaquin Valley of California almond trees are pruned every year after harvest in the late fall or early winter. Prunings are typically removed from orchards with a "buck-rake" mounted on a tractor, placed in burn piles, and burned green, generating large amounts of smoke. In 2003, the San Joaquin Valley had 530,000 bearing acres of almonds. Preliminary studies have shown that approximately 2,000 pounds per acre are removed annually in prunings (Almond Board 1998). This would result in the burning of approximately 530,000 tons of green almond prunings per year.

The wood chipping or shredding of almond prunings could provide an alternative to burning that could add valuable organic matter to San Joaquin Valley soils typically low in organic matter. A small percentage of almond growers have been chipping or shredding their purnings, some for over 14 years because they are farming on the agricultural-urban interface where brush burning is prohibited because of its close proximity to urban housing. Other growers have chipped or shredded their prunings solely to add organic matter to their soils. But many growers fear that wood chips or shreddings will interfere with harvest and take valuable nutrients away from their trees because of their high carbon to nitrogen ratio. If wood chips and shreddings can be shown not to interfere with harvest or take valuable nutrients from trees, then growers would be more likely to adopt chipping or shredding as an alternative to burning, especially if advantages to soil health and nutrition could also be demonstrated.

Wood chipped orchards soils were sampled and compared to non-wood chipped orchard soils, and an experiment was established where soil was mixed with or without wood chips and placed in containers, each with an almond tree, to investigate the effect of wood chips on leaf-petiole and soil nutrient status, plant parasitic and free-living nematode populations, water infiltration, and basidiomycete (wood rotting mushrooms) populations and their ability to aggregate soil.

Soil analysis after three years showed higher levels of calcium, magnesium, sodium, chloride, boron, zinc, manganese, iron, copper, carbon, phosphorus, potassium, ammonium, and % organic matter in wood chipped soils. There was less manganese, iron, and nitrate in the wood chipped soils after two years but by the third year manganese and iron levels were significantly increased while nitrate levels were higher in wood chipped soils. The soil pH was significantly reduced all three years. Tissue analysis was performed on leaf petioles for four years. After the first year trees growing with wood chips had significantly less nitrogen, zinc, and manganese, while phosphorus was significantly increased. After the second season trees with wood chips no longer had significantly less nitrogen or manganese while phosphorus and potassium levels were significantly increased. Zinc levels were still significantly decreased in trees growing with wood chips. After the third season trees growing with wood chips had higher nitrogen levels while phosphorus, potassium, calcium, zinc, manganese and iron levels were all significantly higher. By the fourth season nitrogen and iron levels were significantly higher in leaf petioles from trees growing with wood chips. But potassium and calcium levels were no longer significantly greater in tree with wood chips, while phosphorus, zinc, manganese, and boron levels remained significantly higher. After two years trees growing with wood chips had less shoot growth, but by third and fourth year trees growing with wood chips had significantly more current season shoot growth. Water infiltration was significantly greater in wood chipped soils. There were more free-living bacterial (bacterivorous) and fungal feeding (fungivorous) nematodes in the chipped soils when compared to non-chipped soils. More basidiomycetes were counted in wood chipped soils and detected at higher levels with ELISA. Larger soil aggregates were found in wood chipped soils. Undisturbed wood chipped soils had more soil aggregates than disturbed soils.

Fight this Pistachio Pest NOW! By Craig Kallsen, UC Cooperative Extension, Kern County

Navel orangeworm, *Amyelois transitella*, wreaked havoc on the economic returns of many growers in the San Joaquin Valley this season. This pest is particularly insidious in that not only does it directly reduce yield by reducing the number of harvested nuts, but infested nuts that are missed during processing end up in consumer packaging. During the past season, it was common for growers to find 2% or more of their nuts arriving at the huller infested with navel orangeworm. Levels of 5% or more of infested nuts will probably result in the entire load of nuts being processed as shelling stock or lesser products instead of being packaged as the more valuable in-shell nuts that consumers associate with pistachios.

Early-season infestations in an orchard can be determined based on the use of egg traps baited with mixtures of almond press cake and almond oil. The first generation of moth egg-laying activity usually peaks in late April and early May and the second generation in late June or early July. Generally, however, only the third generation is treated with chemicals. If populations are high early in the season, appropriate insecticides (azinphosmethyl, phosmet, carbaryl, permethrin) are applied approximately 300 to 400 degree-days after third-generation egg laying beings, usually in early August. If third generation egg-traps lose their effectiveness, treating 1300 degree-days after the onset of second generation egg laying will approximate the appropriate time for treating third generation navel orangeworms.

Frequently navel orangeworm populations do not reach damaging levels until late in the season. In early to mid-August, if the orchard has not yet been treated, nuts can be collected from the field and examined with a magnifying glass. The greater the number of early split nuts the more likely it will be that navel orangeworm is a problem. Usually a sample of 100 to 200 randomly collected nuts from the orchard are inspected, and if 3% to 4% of the nuts have eggs, the orchards will be treated with a registered insecticide. In an untreated field, the percent infestation of the nuts can climb by 1% a week. Generally the later in the year that pistachios are harvested, the greater the number of infested nuts. As many growers discovered this past year, chemical control may not be adequate to reduce infestations sufficiently.

Navel orangeworm does not over-winter in the egg, so it is dependent for survival as a larva in unharvested nuts left on the tree or on the ground during the winter in the San Joaquin Valley. The pest has the ability to fly inter-orchard distances, so effective control is dependent on measures conducted on an area-wide basis. Adequate control in pistachio orchards involves both insecticide application and winter sanitation. In an isolated orchard, the primary source of infestation is from last year's nuts. Most growers are shaking or poling the old unharvested nuts from the tree sometime during the period from November through February. The sooner the old nuts are on the ground and blown off the berm into the middles between tree rows for destruction or burial, the sooner navel orangeworms will lose overwintering sites. Some data suggest that nuts left on the berm provide a more favorable habitat for survival than those left in the tree, so destruction of the nut is necessary for control. The harvest results are in and the message is clear. The

navel orangeworm is a pest with significant potential to seriously damage the pistachio industry. Beating the navel orangeworm will require vigilance at home, an unusual degree of cooperation among neighbors, and a multifaceted control strategy involving monitoring, targeted insecticide treatment, orchard sanitation, and further research.

Tree Height – Its Role in Production by Kevin R. Day, UC Cooperative Extension, Tulare County

For the past several years we have been studying the relationship between tree height, labor costs, and related production and fruit quality issues. Using a block of Summer Bright nectarine trees planted at the Kearney Ag Center, we compared standard sized trees (12-13' tall) with short trees (8-9' tall). Trees were planted as either 2-leader V's or 4-leader V's at 6'x18' and 9'x18' respectively. In order to get comparable planar bearing area between the two systems we flattened the limbs of the shorter trees as represented below in figures 1 and 2. Yield studies have indicated in this trial that short trees have a yield/sizing potential equivalent to that of the tall trees.

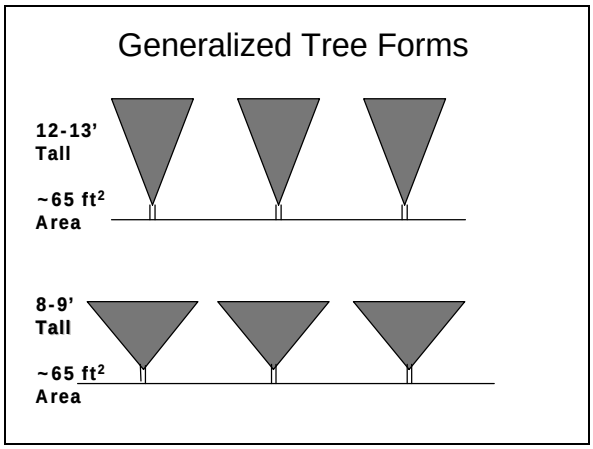

Figure 1. Generalized tree forms of tall and short trees, showing equivalent planar area.

Figure 2. 2-Leader Kearney V trees showing flattened limb angle to reduce height and vigor.

The flowing is a summary of what we have learned so far:

- Labor costs can be reduced by an average of 20-30% depending on the labor operation in question.

- It is possible to design a short tree/orchard system that intercepts as much light as a standard tall system.
- When light interception is constant, short trees have as great a capacity to bear and size as crop as do tall trees.
- Vigor control is an issue, but it can be done through judicious care, development of proper tree form, and especially by not fertilizing too much.
- Proper limb orientation and branch placement is critical to success.

Producing D.O.V. Raisins with a Traditional Trellis By Bill Peacock, Steve Vasquez, & Fred Swanson, University of California

This system allows the production of dried-on-vine (DOV) raisins using a traditional trellis with no trellis modification or retrofitting cost. We have been evaluating this system at the Kearney Research and Extension Center (KREC) and in grower vineyards for three years and find the system to be practical and feasible. DOV raisins have been successfully harvested using a variety of wine grape harvesters. DOV raisin production requires that canes are severed by August 15th or soon after. A minimum of 19-20 °Brix is needed to produce good quality raisins. DOV raisins grade higher than tray dried when harvested at the same sugar level. It is important to remove green clusters before machine harvesting (several machine owners are developing mechanical means to separate out green berries). It takes about six weeks for raisins to dry below 16% moisture. DOV raisins require 2 to 3 weeks for raisin moisture to even out in the bin before delivering to the packinghouse. Shaking DOV machine harvested raisins is not necessary. Sand problems are eliminated. Over drying is not a problem but under drying could be a problem when canes are severed after the 20th of August.

Severing Fruiting Canes: When sugar reaches 19 to 20 °Brix, you can cut fruiting canes and make a quality raisin. However, to successfully dry on the vine, fruiting canes should not be severed any later than the end of August or a dehydrator will be required to finish drying. The probability of successfully drying raisins on the vine is 90% when canes are severed during week of August 15, 70% to 80% if the canes are severed a week later on August 21, and less than 50% when severed two weeks later on August 28.

Head fruit should be harvested and hung on a trellis wire a week to ten days after canes are severed, and fruiting canes that were missed initially are severed at the same time. Just prior to harvest, it may be necessary to walk the vineyard one last time and drop any missed head fruit on the ground. In spite of this effort, some green berries are occasionally scattered in the bin during machine harvesting. These green berries will, however, desiccate in the bin and blend in after about two weeks in storage. It takes six to eight weeks for the raisins to dry on the vine. Towards the end of the drying process, raisins will lose about 1% moisture a day when temperatures are in the upper 90's and about 1% in three or four days when temperatures are in the 80's. The drying season is essentially over by mid-October and growers will need to begin the process of harvesting and then finish drying in the yard or at a commercial dryer. Raisins harvested at 17% to 18% moisture can be stored several weeks or more before drying. Raisins harvested at 19% to 20% moisture should be placed in half bins and drying should be finished within a week or so. Raisins above 20% moisture must be placed in half bins and dried immediately or they will mold. Placing them in cold storage does not help the situation since only the outer layer of raisins is cooled.

Machine Harvest: Ideally, raisins should be dried to 14% moisture or less before harvesting. Sugaring while in storage is less of a problem when raisins are below 14% moisture. It is nearly impossible to over dry, and 11 or 12% is about as dry as you can get them. Green berries

scattered in the bin during machine harvesting will equilibrate in about two weeks. Green berries add moisture to the bin and increase the average raisin moisture.

Raisins are a little easier to harvest in the afternoon than in the morning. Harvesting in the morning removes fewer dry leaves from the vine but it is also more difficult to shake the raisins off the vine requiring a reduction in ground speed and an increase in the rpm of the picking head to do a good job. Typically, harvesting ground speed is about 3 mph in the morning and 4 mph later in the day. Picking head and fan rpm are increased as the day goes on and both should be evaluated every few hours and adjusted accordingly. The fans should be adjusted to remove leaves and substandard raisins. Care should be taken not to have fan speed high enough to remove any quality raisins. The picking head, ground speed, and fan are adjusted so that harvest efficiency is maximized while damage to the trellis is kept at a minimum.

Belts need to be water lubricated on most of the machines to keep raisin paste from building up and sticking to the belts. Not much water is required for the job, about 50 gallons per day. Water is gravity fed onto the inside of the belts and rollers. Dry canes and pieces of trunk can jam belts causing down time for the machine and this can be a problem with older vineyards. Industrial magnets placed at the raisin outlet of the machine are effective for removing metal objects that may sometimes detach from the trellis. Raisins are normally delivered to packers without shaking.

Different Trellises: Different trellis configurations, single wire and various cross arm widths, are being evaluated at KREC using the traditional trellis DOV system. Raisins dried more uniformly with wide cross arm systems and also more quickly. We estimate the cross arm reduced drying time by about a week under normal weather conditions. The cross arm increased raisin production compared to a single wire vertical trellis by approximately 8% for every foot of cross arm width.

Cost: DOV vine preparation and harvesting cost will vary depending on the vineyard age and trellis. Trellis damage resulting from machine harvesting ranged from little to significant; we assumed $50.00 repair cost to represent the average vineyard. Winter pruning will be less expensive with DOV system, and we estimated a $50.00 savings for the average vineyard.

Vine Preparation and Harvest Cost	**Cost/Acre**	**Cost/Ton (2 ton vineyard)**	**Cost/Ton (3 ton vineyard)**
Shoot Selection and Positioning (spring)	75.00	37.50	25.00
Cane Severance (summer pruning)	100.00	50.00	33.33
Harvest Green Clusters (hang on wire)	75.00	37.50	25.00
Mechanical Harvest	125.00	62.50	41.66
Trellis Repair After Machine Harvest	50.00	50.00	50.00
(Winter Pruning Credit)	(50.00)	(50.00)	(50.00)
Total Cost (vine preparation and harvest)	**$375.00/A**	**$187.50/T**	**$124.99/T**

Coming Events:

San Joaquin Valley Grape Symposium Wed 7 Jan 04
Web site: cefresno.ucdavis.edu
Contact Steve Vasquez 559/456-7567

Tri-County Walnut Day, February 5, 2004, Visalia, contact Bob Beede:
559-582-3211 ext 1-2737 Web site: cekings.ucdavis.edu

Varietal Winegrape Short Course – intensive three day course covering all aspects of winegrape production. 2-4 March 2004 Brochures are available at the Cooperative Extension office. This course often fills up so register early.
Web site: www.extension.ucdavis.edu

Chill Hours
As of 15 Nov we have only accumulated 91 hours at or below 45F.
We have 150 more to go if we are going to make our average of about 200 on 1 Dec.
You can view the historical chilling hours for northern Merced County at **cemerced.ucdavis.edu** and by selecting Agriculture/Tree and vine program/Chilling hours chart.

NEW APRICOT COST STUDY

A new cost study for Central Coast apricots has been published. This cost study is based upon a five-acre home site. The cost study does reinforce what many growers already know – it is difficult to make money growing apricots with our current marketing situation. The cost study is available for free at **coststudies.ucdavis.edu** and most Cooperative Extension offices for a small charge.

We also have Sample Costs To Establish A Cling Peach Orchard And Produce Cling Peaches, Sacramento and San Joaquin Valleys, Late Harvested Varieties, 2003

Check our local web site.
Back issues of Tree and Vine Notes and lots of other information are available at **cemerced.ucdavis.edu.**

New Book On Ag Labor Management
Increased productivity, lower turnover, happier workers and increased profitability are the results of up-to-date labor management. The newly updated and expanded book on ag labor management is now available in both English and Spanish. Written by Gregory Billikopf, Personnel Management Farm Advisor for the northern San Joaquin Valley, this book will be helpful for any farmer or rancher.
~ you can read the book for free at: www.cnr.berkeley.edu/ucce50/ag-labor/
~ or to purchase a hard copy, call Gregory at (209) 525-6800.