



TREE AND VINE NOTES



December 2005

Spreading Prune Bloom = Higher Yield and More \$?

Franz Niederholzer, UCCE Yuba/Sutter Counties

- **Apply a dormant spray with high oil rate in late December/early January on some acreage to advance bloom in those trees. (Caution! Trees are most sensitive to oil burn in the dormant period.) Spray the remaining acres in November or February.**
- **Keep weeds long if hot weather is predicted at bloom and short if cold weather is forecast for bloom.**
- **Consider alternating pruning to avoid high pruning costs ahead of crop set.**

Orchards should be managed to spread bloom and reduce the risk of crop loss due to bad weather at bloom. Too much heat **OR** too much cold (frost) at bloom can be the difference between making or losing money. The following is a list of practices that growers may want to consider as bloom approaches in 2006:

Dormant oil: Narrow range spray oil (approx. 4 gallons per acre) applied in late December or the first half of January will generally advance bloom by a couple of days. In the south Sacramento Valley in 2005, this difference in bloom timing was the difference between a good crop and a disaster in at least one location. Many growers use a high rate of oil plus a pesticide as their "dormant spray" to control pests (aphids, mites, peach twig borer, and scale) and advance bloom. After the middle of January, a dormant spray with a high rate of oil generally has little effect on bloom timing or intensity. However, Joe Connell, UCCE Farm Advisor in Butte County, reports that 4-6 gallons of oil/acre will delay bloom when applied about 10 days ahead of anticipated almond bloom. **Note:** Oil can burn prune trees if sprayed on dry trees. Prune trees are most sensitive to oil burn before bud swell (December/January), and less sensitive to oil burn in the delayed dormant period (after mid-February). Growers concerned with insect pests and weather risk at bloom may want to consider spraying some of their acreage with high oil rates + pesticide in late December/early January and the rest in November or the delayed dormant (late February). [High oil rates would not be needed for the other half of the orchard unless scale is a problem.] This should spread bloom as much as possible. Some growers have used this strategy for years. [Nitrogen fertilizers -- such as CAN17 or potassium nitrate -- plus a surfactant can advance and tighten cherry bloom. Current UC research, funded by the California Dried Plum Board, is testing these materials in prune to find the best timings and rates to manipulate bloom.]

Orchard floor management: Tall vegetation, like long grass or high cover crop, = lower temperatures in the orchard and more risk of frost damage than close-mowed or disced blocks. When bloom weather is warm, tall weeds may increase humidity and decrease temperatures, perhaps helping reduce risk to the crop from high temperatures. (Note: Higher humidity can also increase brown rot risk.) In blocks that are not disced both ways, herbicide strip sprays should be applied weeks ahead of bloom to control weeds and reduce risk of frost damage.

Prune light or rotate pruning: Pruning is expensive, and heavy pruning encourages shoot growth in light crop years. Heavy detailed pruning helps improve fruit size, encourages spur renewal, and fruit removal at harvest. However, in years with heat at bloom (like 2004-2005) that reduces the % set in a block, the more flowers on a tree the higher the yield should be. Some growers are waiting until after bloom to prune, but waiting until fruit have set (mid-April) means that accurate pruning is difficult due to leaf and shoot growth and some of the trees resources will be put into the wood and fruit that is removed. Alternate year dormant pruning is a compromise that can reduce pruning costs for the entire block and spread the risk of light vs. heavy cropping, and allows pruners to work faster and more accurately. A hard, detailed pruning on a third to half of the acreage every year on a 2-3 year rotation can keep spurs rejuvenated and limit the number of hard-to-harvest hangers. In alternate years, some combination of topping, hedging, or mechanical thinning can effectively manage the crop while allowing for maximum set in years of extreme weather at bloom.

Pruning Mature Dried Plums

Bill Krueger UCCE Glenn County

Hand pruning is the most expensive cultural practice in prune production and can cost from 200 to 300 dollars per acre or more. With low returns to dried plum growers and increasing costs there has been a tendency to reduce costs by reducing pruning.

Mature trees are pruned to improve fruit size, reduce alternate bearing, remove diseased or dead wood, and control tree size. Prunes are prone to over cropping and alternate bearing. Excessively cropped trees will produce small fruit with a higher drying ratio. Over cropped trees may suffer from limb breakage, sunburn, and potassium deficiency. Crops following heavy crops will likely be light leading to excessive vegetative growth and excessive cropping the following year (alternate bearing).

Pruning Basics

Pruning can be thought of as light management within the tree canopy. Fruit size and drying ratio are directly related to the light regime close to where the prunes are growing. Pruning can insure that there is adequate light in proximity to the fruit.

Trees are pruned using a combination of thinning and heading cuts. Thinning cuts are where the limbs are removed as close as possible to the parent limb. Thinning cuts are used to open up and thin out canopies and fruit wood and to control tree height. Thinning cuts result in overall invigoration because more of the tree reserves are available to the remaining wood. With heading cuts a portion of the existing limb is removed. Heading cuts are locally more invigorating than thinning cuts and usually result in vigorous upright growth near the cut. The more severe the cut, the more vigorous the growth response. As the distance from the cut increases the response decreases. Heading cuts are used to invigorate trees and insure branching at specific sites.

Pruning mature dried plums consists mostly of thinning cuts to thin out the canopy and fruit wood. Heading cuts can be used in the tops of the tree or where invigoration or stimulation of branching is desired. With pruning, we are attempting to balance vegetative growth with reproductive growth. Signs of under pruning include undersize fruit, limb breakage, and limited vegetative growth. Over pruning is indicated by excessive vegetative growth and reduced crop.

Alternative Pruning Strategies

Alternant year pruning. A study of alternate year pruning conducted by UC researchers during the eighties at four locations in the Central Valley showed that alternate year pruning might be feasible for growers interested in reducing pruning costs in a particular season. However, pruning time and costs will be increased in the year that the trees are pruned compared to annual pruning. Fruit sizes and revenues were not significantly different over the four years of the trial. However, sizes and revenue was reduced in certain locations in certain years.

Alternate year pruning, if used, should be implemented prior to an expected heavy year to help moderate the heavy crop. Another strategy may be to have different pruning levels in deferent blocks to spread risks of low fruit set. If the set is excessive in the lighter or not pruned blocks, it can be adjusted with mechanical thinning around pit hardening.

Mechanical Pruning. Hedgers and topplers have long been used in to reduce pruning costs. Unfortunately, mechanical pruning is a non-selective type of pruning, which removes all of the vegetation in the area that is pruned. Most the cuts are heading cuts. In a trial conducted in Glenn County during the eighties, various mechanical pruning strategies were compared to hand pruning in a hedgerow planting. The bottom line was that if the mechanical pruning was severe enough to result in similar fruit size and drying ratio as the hand pruned, the yield was reduced. Mechanical pruning in the dormant season may be useful where invigoration of the trees is desirable or heading cuts in the top of the tree are desired such as in young developing orchards. It could also be used in combination with hand pruning to make heading costs in the tops of the trees and reduce the cost of hand pruning.

Other strategies to reduce pruning costs worth considering include pneumatic or hydraulic equipment and pruning towers or positioners to improve worker efficiency.

Fall Nutrition for Almonds & Stonefruit

By Roger Duncan UC Cooperative Extension, Stanislaus County

I am going to assume that all of you almond and stonefruit growers have taken your leaf samples in July and had them analyzed for nutrient content. (I know what happens when you ass-u-me things, but humor me on this). I will also assume that all almond growers have had their hulls analyzed for boron at harvest. Soil samples only need to be taken every few years, but plant tissue samples should be taken annually. By taking samples each year, fertility programs can be adjusted as needed.

Fall can be an excellent time to apply certain nutrients: specifically boron, zinc, and potassium. Let us start with potassium; yield loss occurs in potassium deficient almond trees primarily because fruiting spurs die prematurely. In addition, new fruiting spurs are produced more slowly than in optimally fertilized trees. A local research trial has confirmed that almond yields will decline when potassium levels are less than about 1.4% in July-sampled leaves (1.2% for peaches). There are people who feel that potassium should be much higher than 1.4% (i.e. more than 2%), but we have never seen any evidence in our research trials or surveys to substantiate this. Potassium fertilizer is expensive, so applying potassium beyond what is necessary is a waste of money. However, I prefer to keep potassium levels a little higher than 1.4% for a few reasons:

1. If your leaf analysis shows 1.4% potassium this year, it is possible you will drop below that threshold by next year, which means you may be vulnerable to yield loss. This is particularly true if you are lucky enough to set a large crop in 2006.
2. A leaf analysis is an average of all sampled trees. This means if your analysis comes back at 1.4% potassium, some trees are higher than 1.4%, and some are lower. By applying potassium to the whole orchard, you may waste some fertilizer on trees with adequate potassium levels, but you are protecting yourself from a few deficient trees bringing your average yield down.
3. Our study in Stanislaus County was done with Nonpareil. It is possible that some varieties (Price comes to mind) will benefit from slightly higher potassium levels.

In flood, solid set, or microsprinkler irrigated orchards, potassium can be banded on the soil surface in the fall. Sulfate of potash and muriate of potash (potassium chloride) are the most popular options. Potassium chloride is cheaper but should only be applied in orchards with excellent drainage. It should not be applied in orchards with high water tables or other impediments to deep leaching. Otherwise, chloride toxicity may result. Potassium fertilizers should be applied in a concentrated band, not broadcast. In drip-irrigated orchards, it is best to apply the potassium directly through the drip system unless you can lay the drip hose directly on the banded fertilizer.

Boron. I wish more growers would pay closer attention to this nutrient. This is by far the largest nutrient deficiency problem in the county. Many growers over-fertilize with nitrogen, spend hundreds of dollars on potassium fertilizer each year, and yet do not spend the few dollars to correct a boron deficiency problem. Hull samples are the most sensitive indicator of boron status. If your hulls have less than 80 ppm B, your trees are deficient and you are probably experiencing yield loss (trust me, if you are east of Highway 99 and have not applied boron, you are deficient). For the price of a burger and fries, you can correct boron deficiency and increase your yield. Apply 2 – 4 pounds of actual B (10–20 pounds of a 21% product) per acre to the soil. Do not apply boron in a concentrated band. Granular boron can be broadcast on the soil while soluble boron formulations can be injected into your micro-irrigation system. Some growers have successfully applied boron in their herbicide strips, but care must be taken not to affect the activity of certain herbicides. Soil boron applications will last 2-3 years, depending on soil type.

If your hulls have less than 120 ppm boron, you may increase your 2006 yield with a post-harvest boron foliar spray. Fall sprays do not have enough boron to correct overall boron deficiencies, but they do temporarily replenish a transient deficiency in the dormant fruit bud. Apply 2-3 pounds of a 21% boron product in 100 gallons of water while leaves are still active on the trees. If you miss the post-harvest period, you can also include boron in an early bloom (pink bud or popcorn) spray. Boron sprays at full bloom have been shown to reduce yield. Boron sprays after bloom is not very helpful.

Zinc. Zinc deficiency symptoms are most obvious in the spring. Zinc deficient trees often have delayed opening of flower and vegetative buds. Leaves are smaller, often have chlorotic areas between the veins, and have a “wavy” leaf margin. Sometimes internodes are shortened. Later in the season, subsequent growth hides these symptoms, but nut size is reduced. Zinc deficiency is most common in rapidly growing young trees or in areas with alkaline soils. Soil applications are expensive and inefficient. Zinc deficiency is best corrected with foliar sprays. Basic zinc sulfate (neutral zinc 52%) or zinc chelate can be applied safely at any time of the growing season at proper rates. This is the most efficient method of zinc fertilization because it can be “piggy-backed” with other planned sprays. Some growers apply a fall “leaf burn off” spray with 10 – 15 pounds of zinc sulfate in 50 – 100 gallons of water. This should be done at the beginning of normal leaf senescence (around the first of November). A word of caution – we have seen shoot and bud burn in peaches when zinc sulfate was applied in large amounts of water or when rains followed shortly after application. The excess water caused the zinc solution to accumulate to toxic levels at the lowest point on the shoot.

Fall Urea Sprays

By Roger Duncan UC Cooperative Extension, Stanislaus County

It is certain that nitrogen plays a key role in bacterial canker management. A fall application of lo-biuret urea can supplement a grower's nitrogen program and should be a standard practice in orchards chronically affected with this disease. In our trials with replanted peaches, 100 pounds of lo-biuret urea at the beginning of leaf fall (around November 1) made the trees more resistant to bacterial canker. I do not know if we would have the same effect at lower rates. My guess is that lower rates would be less effective.

What about foliar urea on “healthy” orchards?

Studies have shown that foliar urea sprays can increase flowering, fruit set, and yield of citrus. I conducted two trials to see if fall foliar urea might increase almond yields in “healthy” orchards. We applied 0, 25, 50, or 100 pounds of lo-biuret urea per acre in replicated trials in almond orchards in Patterson and Modesto. Both orchards have some ring nematodes but no bacterial canker. Past yields in these two orchards have been OK, but have not lived up to expectations. Neither orchard was nitrogen deficient according to leaf analyses. Yields for the urea treatments are listed below.

Rate of Lo-biuret Urea	Nonpareil Yield (lb per acre)	
	Patterson Orchard	Modesto Orchard
0 lb	1323	1140
25 lb	1405	1256
50 lb	1382	1194
100 lb	1356	1279

Observations from these trials:

- Yield increases from urea sprays were not statistically significant at $P < 0.05$
- There was certainly no yield benefit to applying more than 25 lb per acre
- We had shoot burn in the lower canopy in both locations at 100 lb per acre
- Trees sprayed with 100 lb urea flowered 1-2 days earlier than untreated trees

Other thoughts on lo-biuret urea:

In a three-year trial conducted several years ago by former UC Soils Specialist Roland Meyer, fall sprays with ten pounds of lo-biuret urea resulted in yield increases of 274, 44, and 187 pounds per acre over unsprayed trees. However, just as in my two trials, these increases were never statistically significant. My feeling is that fall urea sprays may slightly increase yields in some cases, but do not expect miracles. If you have a bacterial canker problem, 100 lb urea will help with that. If canker is not an issue, fall urea sprays may help with yield a little, but there is probably no need to apply more than 10-25 pounds. Thanks to Joe Martini of Sun Flower Ranch and John Regusci for participation in these trials

NEW COST STUDIES AVAILABLE

Sample Costs to Establish an Orchard and Produce Pomegranates, 2005, San Joaquin Valley South shows current per acre costs to establish and produce pomegranates.

Sample Costs to Establish an Orchard and Produce Sweet Cherries, 2005, San Joaquin Valley North

All of the studies are available online at <http://coststudies.ucdavis.edu>, or they may be ordered from the Department of Agricultural and Resource Economics, University of California, One Shield Avenue, Davis, CA 95616; from local UC Cooperative Extension offices; or by phone at (530) 752-4424.

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2005 North San Joaquin Valley Cling Peach Seminar



Tuesday 13 December 2005
8:30am – Noon

Stanislaus County Agricultural Center
Service and Crows Landing Roads, Modesto

Sponsored by UC Cooperative Extension and the Cling Peach Board

8am – 8:30am

Registration, Coffee, and Donuts

8:30am

Program Begins

- ?? **Update on Stanislaus County Trials (30 Minutes)**
Roger Duncan, UCCE Farm Advisor, Stanislaus County
- ?? **Update on Permit Conditions for Peaches (30 Minutes)**
Kevin Gonsalves, Deputy Ag Commissioner, Stanislaus Co.
- ?? **Managing Oriental Fruit Moth Through the Integration of Mating Disruption and Biological Control (30 Minutes)**
Walt Bentley, IPM Entomologist, UC Davis
- ?? **Cling Peach Board Business**
-Discussion of Industry Research Needs
-Board Member Nominations
- ?? **Tree Crop Fertigation (30 Minutes)**
Blaine Hansen, CE Specialist, UC Davis
- ?? **Chemical and Mechanical Thinning (30 Minutes)**
Janine Hasey, UCCE Farm Advisor, Sutter-Yuba Counties
- ?? **Mechanical Thinning**
Maxwell Norton, UCCE Program Leader, Merced County

Noon

Bar-Be-Que Lunch

Hosted by the Cling Peach Advisory Board

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Including 0.5 Hours of Laws & Regulations**