UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

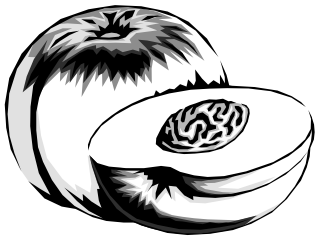
January 2010, Vol.

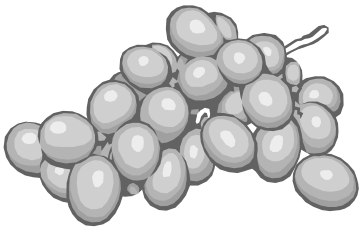
THE SCOOP

on fruits and nuts in Stanislaus County

by Roger Duncan

Pomology and Viticulture Advisor





1.5 hours
of Continuing Education &
3.0 hours of CCA credits

2010 North San Joaquin Valley Almond Day

Sponsored by
University of California Cooperative Extension

January 28, 8:30 a.m. - 12:00 noon

Stanislaus County Agricultural Center
Service and Crows Landing Roads, Modesto

8:00 Registration

8:30 Program Begins

Evaluation of Fungicides and Commercial Bloom-applied Materials for Effects on Almond Set & Yield
Roger Duncan, Farm Advisor, UCCE Stanislaus County

Evaluation of Various Zinc Products for the Most Efficient Zinc Fertility Program
Dr. Scott Johnson, UCCE Pomology Specialist, UC Kearney Ag Center

New Information on Navel Orangeworm Management
Dr. Frank Zalom, Professor / Extension Entomologist, UC Davis

Rootstock Selection for Salinity Management
David Doll, Farm Advisor, UCCE Merced County

Update on Lower Limb Dieback of Almond
Dr. Bruce Lampinen, Pomology Specialist, UC Davis

Irrigation 101: When, How Much and How Often Should I Irrigate?
Blake Sanden, Soils & Water Farm Advisor, UCCE Kern County

12:00 Adjourn

U.S. Department of Agriculture, University of California, and Stanislaus County Board of Supervisors cooperating

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Assessment of Multiple Approaches for Controlling Gophers in Orchards

Roger A. Baldwin, UC IPM Wildlife Pest Management Advisor, Kearney Ag Center

Pocket Gopher Control Options

Pocket gophers cause extensive damage to many crops throughout California. Many tools are available for controlling gophers including trapping, fumigation with aluminum phosphide, poison baits, and the use of a gas explosive device. Trapping gophers has been a common method for controlling gophers for many years. However, a new trap called the Gophinator (Trapline Products, Menlo Park, CA) is now available that may increase efficiency of trapping. Additionally, combining aluminum phosphide fumigation with trapping may increase effectiveness, as gophers will occasionally spring traps without getting captured. In these situations, gophers often become trap shy and are much more difficult to capture. Treating these tunnel systems with aluminum phosphide shortly after trapping could remove these individuals from the population thereby increasing gopher control in vineyards. Poison baiting has often been used to control gophers. Efficacy of baiting has varied widely, although strychnine has traditionally been most effective. Gas explosive devices may also be effective. These devices combust a mixture of propane and oxygen within tunnel systems, thereby killing gophers through concussive force while also destroying the burrow system.

Testing Efficacy

All of these methods are currently allowable techniques for controlling gophers in California, although the efficacy and efficiency of these approaches, particularly in comparison to one another, remain unclear. Therefore, I tested these control strategies at Laguna Ranch, Sebastopol, CA, from 6 April – 8 May, 2009, to estimate the efficacy and efficiency of these approaches. Plots of all three treatment types (trapping + aluminum phosphide, baiting with strychnine, gas explosive device [Rodenator®]) were established within each block. Comparisons of the number of gopher activity plots that contained fresh gopher mounds and feeder holes before and after treatments showed substantial reductions in gopher sign for all trapping + fumigation plots (range = 74–90% control). No baiting (range = 30–56% control) or Rodenator® (range = 0–55% control) plots indicated substantially reduced gopher sign. The time required to apply each treatment was relatively similar between baiting, trapping, and Rodenator® treatments (90–106 seconds per burrow); fumigation treatments were substantially longer (260 seconds). Approximate costs per acre for each treatment were $420 for baiting, $396 for the Rodenator®, and $252 for trapping + fumigation.

Conclusions

To be effective, control measures need to result in a minimum of a 70% reduction in plots with gopher activity; values of 80–90% are preferable. Trapping + fumigation met this minimum criterion in all three plots, and met the more rigorous criterion in 2 of 3 plots. Even the one plot that fell short of an 80% reduction in plots with gopher activity yielded a 92% reduction in overall gopher activity. In addition to being more efficacious, trapping + fumigation was also more cost effective. Therefore, trapping + fumigation appears to be an effective method for controlling gophers. Baiting and Rodenator® treatments did somewhat reduce gopher activity in most plots, but these levels of control fell well below the minimum threshold for effectiveness (70%). As such, growers may realize short-term benefits from control, but will have to apply equal effort for control the following year, whereas more effective control measures (80–90%) would reduce the cost of control in subsequent years.

Recommendations

- Although controlling pocket gophers is possible year-round, control methods are best conducted from winter through early spring when soil moisture is high. Gophers mound more during this period; identifying fresh mounds is key to effective control.

• Trapping and fumigation with aluminum phosphide appear to be the most effective methods for controlling pocket gophers. Areas should be treated a minimum of two times to increase overall control.

• Baiting and Rodenator® treatments were less effective following two treatment applications. The effectiveness of these methods would likely increase with further applications. However, these added treatments would increase the cost of control.

• The size of gopher populations should be assessed before and after treatment to determine the effectiveness of treatment applications. An easy method to index gopher populations is to establish 20–25 30x30 ft. plots evenly throughout your treatment area. A few days before treating the field, flatten all old mounds within each plot (using your boot or a rake is a good way to flatten mounds). Three days later, check all survey plots for new mounds. Divide the number of plots with fresh mounds by the total number of plots and multiply by 100. This provides an estimate of the percent of your field with gopher activity. Repeat this process 2–5 days after applying control treatments (i.e., baiting, trapping, fumigation, etc.). This will give you the percent of your field occupied by gophers before and after treatment and will let you estimate how effective your control measures were. Ideally, you should work to reduce gopher populations by >80–90% to observe substantial reductions in gopher populations the following year.

Once treatment applications are finished, continue to monitor fields periodically for reinvading gophers. Pay particular attention to the perimeter of fields, as these are the areas that gophers will first reinvade. Controlling gophers along the perimeter of fields will keep gopher populations from building back up throughout your fields.

Training First Leaf Trees

It seems to me that training of young almond trees has gotten increasingly bad over the past few years. Scaffold selection has become a lost art, even with some of the commercial labor companies. It is depressing to visit young, vigorous orchards where trees are being destroyed by scaffolds that have broken out or crotches that have cracked and become infected with disease. There is nothing much a grower can do at that point except prune heavily to reduce the weight of the limbs, reduce the vigor of the trees, make sure the trees are tied very well and replace them as they die from various canker diseases.

Proper scaffold selection is important to minimize scaffold failure. While most growers understand the need to space scaffolds properly around the tree, many fail to space scaffold limbs properly up and down the trunk. Any scaffold limbs originating in the same plane (at the same height) will have a weak attachment and are susceptible to splitting out in later years. Ideally, we want three – five inches of vertical space between each limb. That means if you select four scaffolds, the topmost and bottommost limbs need to be a minimum of 10-12 inches apart.

The angle a limb is attached to the trunk is also important. Bark sometimes becomes imbedded at the base of shoots that are very upright. This leads to weak attachment of the limb and it will likely split out when the first heavy crop sets. Limbs that are too flat tend to lose their vigor and will be overcome by the rest of the tree. Ideally we want to choose primary scaffolds that originate about 45 degrees from the trunk. Unfortunately the ideal tree rarely exists!

Oftentimes the largest, best looking limbs on a one-year-old tree are the very top two or three shoots. Unfortunately, these shoots are fairly upright and originate close together on the trunk. RESIST the temptation to keep more than one (preferably none) of these

limbs. This is ESPECIALLY true with ALDRICH AND PADRE trees because of their very upright growth habit. You are much better off selecting smaller shoots that are spaced correctly up and down the trunk than large shoots that are too vertical or that originate at the same height on the trunk.

How many scaffolds should I keep? Although I am still a fan of retaining only three scaffolds, I don't think the quantity of scaffolds is nearly as important as the quality. This is especially true in high density plantings where trees won't get as large as widely spaced trees. In my almond tree spacing and pruning trial, the farther apart the trees were spaced, the more the trees were susceptible to breakage. Therefore scaffold selection is most important in widely spaced orchards (less than 110 trees per acre). In addition, selecting only three scaffolds will make it easier to limb shake when widely spaced trees get too large to trunk shake in later years.

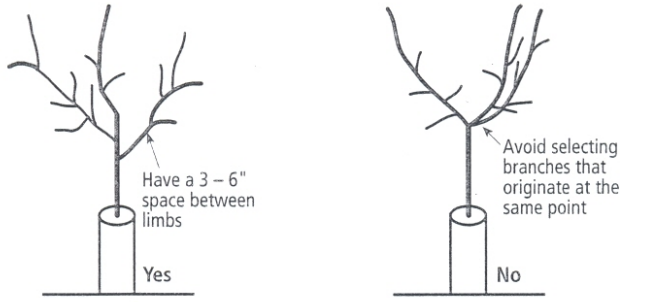
Grower interest in minimal pruning has recently increased. In my local trial, we had more problems with splitting trees where we did no scaffold selection. Again, I don't think the NUMBER of scaffolds was the major problem – it was the failure to select properly positioned scaffolds. When you do no scaffold selection, you will always have some poorly positioned limbs and these are more susceptible to breakage. My suggestion to those considering minimal pruning is to properly select scaffolds during the first dormant season and then think about reducing your pruning in later years.

A few hints for the first growing season which may help with your first dormant pruning:

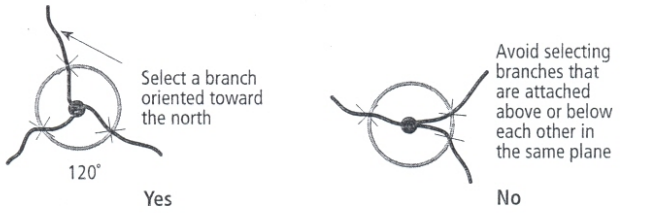
• Top trees at 36 – 40 inches at planting time. Some nursery catalogues suggest topping newly planted trees at 28 - 32 inches. This is too short for almonds. If you want a trunk that is two feet high for shaking and you need another 12 inches for proper scaffold spacing (see section above); newly planted trees can't be shorter than three feet tall.

• Don't strip off too many shoots above the carton during the first growing season – you may be sorry when it comes time to select your scaffolds. The more shoots you leave on the developing trunk, the thicker the trunk will be at the end of the season.

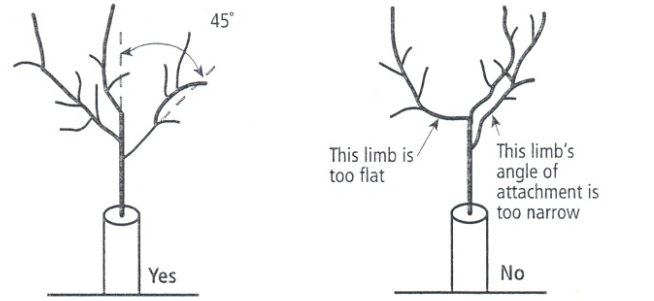
• Summer prune vigorous first leaf trees – a little bit. Don't take off more leaf area than you need to and don't try to make all your scaffold selections at that time – you don't want to limit your options later. Cut off the topmost one or two shoots. This will allow the better angled shoots below to get larger and will eliminate the temptation to keep the top upright shoots during the following dormant pruning. This is especially good to do with Aldrich and Padre.



A. Try to select limbs that have vertical spacing up and down the trunk.



B. Looking downward, select primary scaffolds equally spaced around the tree to provide balance and symmetry.



C. Ideally, the angle of branch attachment to the trunk should be close to 45° to be strong and to maintain vigor.

Figures above were obtained from the UC Almond Production Manual, ANR Pub. 3364.

Silver Leaf Disease

Occasionally this time of year I am asked about the risk of silver leaf disease. Silver leaf is a fairly rare disease so it is difficult to know how concerned a grower should be about his or her particular orchard. A few years ago we identified six or eight almond orchards and one peach orchard with silver leaf symptoms. Since then I have seen an average of less than one new orchard a year with silver leaf in the county. The majority of the affected almond orchards are Butte and Padre, with Padre being the most susceptible variety by far. Most of these orchards have been in the Salida and West Modesto areas. I have also seen infected orchards in Ceres, Hughson and Turlock. Many of the plants silver leaf affects in the wild are often found in riparian areas. I assume the spores are carried by the wind from these wild host plants into almond orchards that are within a few miles of a river. Overall, the risk of getting silver leaf is pretty small. If you know a neighbor has the problem, it may be worth worrying about because the consequences can be severe.

Silver leaf is a disease of pruning wounds. The disease is caused by the wood decay fungus called *Chondrostereum purpureum*. The fungus produces leathery fruiting bodies that develop in bracket-like clusters on infected tree trunks and scaffold branches. During rainy weather, spores are released from these "mushrooms". These spores are then spread through the air. If a spore happens to land on a fresh pruning wound, the fungus can infect the healthy tree by growing into the wood.

In the wood of affected trees, two symptoms may occur: white rot and wood discoloration. In white rot, the decayed wood becomes mottled or bleached white and eventually spongy soft. As the wood decays, its structural integrity is decreased.

Leaf symptoms begin to show one or two years after infection. Leaves of affected trees become silvery in appearance because a toxin produced by the fungus is transported throughout the tree and causes the upper epidermis to separate from the palisade layer (inner tissue) of the leaf. The separated layers then reflect light differently than healthy tissue giving the leaves the silvery appearance. After another year or two, leaves on infected trees become small and scorched and the trees begin to die.

Control. It is not possible to eradicate the infection from affected trees. Therefore, prevention is the only tool we have. The fungus must enter through a wound. Wood-exposing wounds are most susceptible in the first week after injury. After about a month, depending on the size of a pruning cut, wounds heal and infection rarely occurs. Because spores are spread in the wind usually during or after a rain, it is best not to prune prior to a storm. Most of the cases of silver leaf I have seen seemed to have been infected during the first or second year of dormant pruning. Therefore, it may be a good idea to prune nonbearing trees early in the fall before the rainy season. Trees are least susceptible in the summer months (June, July, and August) and they are most susceptible during late winter and early spring when nutrient and carbohydrate levels in the xylem sap are highest. Sanitation measures include removing and burning infected wood.

A preventative application of Plant Shield® has worked well in our trials. Plant Shield® is a biological fungicide which includes spores of the fungus *Trichoderma*. When applied after pruning, this beneficial fungus colonizes the pruning wounds and doesn't allow the silver leaf fungus to grow.

Varietal Wine Grape Production Short Course

February 23 – 25, 2010 UC Davis

Topics include: The cycle of vine growth, environmental grapevine physiology, site evaluation and preparation, issues in vineyard resource conservation, rootstock and cultivar selection, selection and handling of planting stock, spacing and trellising considerations, and vine training. The course fee of $675 includes course materials, three lunches and social on Tuesday evening. To register, call 1-800-752-0881 or go to www.extension.ucdavis.edu/wine.

Inside the Scoop:

- **2010 North San Joaquin Valley Almond Day Thursday, January 28**
- **Controlling Gophers in Orchards**
- **Training First Leaf Trees**
- **Silver Leaf Disease**
- **Varietal Wine Grape Production Short Course February 23-25, 2010**

Wheelchair accessible facilities available. With advance request, efforts will be made to provide accommodations for persons with disabilities.

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.

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The Scoop on Fruits & Nuts
In Stanislaus County
January 2010

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