

IN THIS ISSUE



Practices to consider in prune orchards this fall

Prune Orchard Nutrition

Fall Spray for Prune Aphid Management

Prune out Cytospora cankers to reduce disease

Cost saving spray practices for fall prune aphid spray

Two different spots on prune leaves

Submitted by:

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Upcoming Meetings:

Date	Event	Location	Contact
November 15	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Building	822-7503
November 28	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Building	822-7503
November 29	Introduction to almond production	Vets Hall, Yuba City	822-7515
December 3	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Building	822-7503
December 12	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Building	822-7503

Practices to consider in prune orchards this fall.

- Clean up orchards:
 - Cut out *Cytospora* cankers. See more information in this newsletter and online at <http://www.ipm.ucdavis.edu/PMG/r606100311.html>.
 - Clean up “barked” trees damaged at harvest. Trunk/limb damage from harvester can result in *Ceratocystis* canker infection and possible tree death. Cut away any loose or damaged bark back to “tight” bark with a sharp knife or chisel and hammer. If you want to, paint the wound with commercial wound sealer. This should not harm the tree, but there is no research that shows trunk sealing helps heal or protect damaged trunks.
 - Mark dying or weak trees for removal. Backhoe out old trees, making sure to get as much of the roots out of the hole as possible
- Pruning: Pruning is one of the most important and expensive activities in prune orchard management. Eliminating pruning can be a recipe for lots of small prunes, unless the orchard is carefully thinned. No pruning + thinning can be a very effective program, at least in the short term.
- Orchard topping: If you are going to top your orchard between now and bloom, I’d do it now. Regrowth next growing season following fall topping is a little less than after dormant topping. Also, the cuts get a chance to harden off before seasonal rains. Young, well irrigated trees topped before mid-Oct will show some regrowth before leaf fall. This should not harm the trees. Topping young, vigorous trees before a big wind will reduce risk of blow-over.

- ❑ **Orchard Fertility:** Plan your fall fertilizer program. See article in this newsletter.
- ❑ **Insect pest control:** See article in this newsletter.
- ❑ **Bloom advance:** When a high rate of oil (3-5 gallons of oil per acre, alone or with a pesticide) is applied between late December and mid-January, prune bloom can be advanced several days. Don't apply if the soil is dry or trees have been dried out by several days of north wind. Information on the timing of oil to advance bloom is available at:
http://fruitsandnuts.ucdavis.edu/Weather_Services/prune_chilling_prediction_about/.
- ❑ **Plan winter weed control:** Consult with your PCA about your weed control program for the winter and next season. More about weed ID is available at the newly revised UC IPM site for weeds at http://www.ipm.ucdavis.edu/PMG/weeds_intro.html. Once the weed has been IDed, check for control measures under the particular crop on the UC IPM page (<http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html>)
- ❑ **Manage Rodents:** gophers and especially voles can damage an orchard if not managed in the fall. Weedy cover gives voles the perfect "home" from which to feed on bark and possibly girdle trees. A combination of trapping and baiting gives the best gopher control.



Prune Orchard Nutrition

Carolyn DeBuse, UCCE Farm Advisor, Solano and Yolo Counties

Your crop is harvested and the trees are winding down for the season. It is time to think about overall tree health and what needs to be done now to increase tree health and success of next year's crop. There are two nutrients that can be effectively applied in the fall; potassium (K) and zinc (Zn). Both of these nutrients can become deficient in California prune orchards. Use July leaf samples to confirm nutrient status for these and other nutrients. Potassium leaf levels should be between 1.3-2.0% and zinc leaf levels should be above 18 ppm. If either of these two nutrients were low or border line and trees had a good crop, then consider applying zinc and/or potassium this fall or foliar applications next year during the next growing season.

Potassium is required by the tree and the fruit in large amounts. K is essential for many enzymatic reactions for growth, sugar transport, and cellular functions. Most of the annual requirement is used by the crop and is removed from the orchard at harvest.

Symptoms of K deficiency: Signs of K deficiency begin to show early to mid-summer. Upper canopy leaves will look pale with poor growth of new leaves and reduced shoot growth. Final fruit size and quality may also be reduced. Potassium deficient pale leaves turn brown and scorch, finally dropping. Fruit and branches are then vulnerable to sun burning and *Cytospora* canker infection. Dieback throughout the top of the tree is often characteristic of the K deficiency.

Application choices: Application of K can be done either in the fall or during the growing season depending on how you choose to apply it. In the fall, 400- 500 pounds per acre of potassium sulfate (sulfate of potash) or potassium chloride (muriate of potash) can be banded or shanked in along the tree rows using irrigation or winter rains to move K into the soil. The band should be placed in the same spot every year, allowing a concentration of K to build up. This allows for the K to penetrate deeper into the root zone. The safer of the two fertilizers is potassium sulfate and it has no potentially negative consequences. Caution must be used if potassium chloride is used. Chloride toxicity can be a

problem if potassium chloride is used in heavy clay soils, orchards with a high water tables, or in years when the winter rains are unable to leach the chloride away from the root zone.

Summer applications of K can be made by injection through a drip system or foliar sprays of potassium nitrate can be applied. Multiple applications are needed to meet the trees requirements.

Zinc is considered a micronutrient because much less is required by the tree. Never the less, zinc deficiency can be very detrimental to trees health and productivity.

Symptoms of Zn deficiency: Signs of zinc deficiency are visible in the spring with the first indication being a slow or late bloom. As Zn deficiency becomes more severe, the growing tips of the shoots will not elongate and the leaves are small and appear in tufts or rosettes. This symptom is often called 'little leaf' and affected leaves may also have wavy margins. Zinc deficient trees may experience dormant flower bud drop and may have reduced fruit size.

Application: Zinc can be applied as a fall foliar application which has the added benefit of aiding leaf removal to reduce tree blow over and possibly reducing aphid habitat. Zinc should be applied once natural leaf drop has begun and can be tank mixed with some aphid control materials if an application is necessary (oil should not be in the tank mix or used within 30 days of zinc sulfate application).



Fall Spray for Prune Aphid Management

Franz Niederholzer, UC Farm Advisor, Colusa/Sutter/Yuba Counties

Prune aphids – mealy plum and/or leaf curl plum aphid – are key pests of prune. High populations of these pests can reduce tree vigor, fruit sugar content and return bloom the next year. Honeydew from feeding aphids dropped on fruit can increase cracked fruit. Effective prune aphid control – when needed – is a key to successful prune farming.

Recent University of California research shows that a fall pesticide application gives excellent prune aphid control the following season. Effective timing for this spray is late October through early December. After early December, leaves have dropped and a standard dormant spray is very effective. In the fall, soils are usually dry, and spraying is easier and less expensive than in the full dormant season (winter).

Not all pesticides give good aphid control as a fall spray. Research shows that pyrethroids – Asana, Warrior®, Baythroid®, Mustang®, etc. – all give excellent control anytime between mid-October and mid-December. The neonicotinoid (neonic) materials – Provado® (and generics), Actara®, and Assail® – work well in late October but don't work well after leaves begin to drop in early November. This is because the neonic materials have to be absorbed into the leaf to be effective on feeding aphids. Organo-phosphate pesticides – diazinon, Imidan®, etc. – don't work well for aphid control when sprayed before December 1. After December 1, these materials are very effective. Oil is not needed in the tank in a fall spray.

Not all orchards need a spray program for aphid control. If you have a regular history of aphid damage anywhere in an orchard, then a fall spray or dormant treatment is required to control aphids. If you haven't ever seen aphid damage around hard-to-cover areas near buildings or power lines following a dormant spray by air or after every-other row dormant spraying, you may not need to spray for aphids.

What happens if you miss the fall or dormant spray timing? If a late walnut harvest and/or a wet (or dry) winter keep you from a fall or dormant spray in prunes, you still have effective options for aphid

control. Watch the trees for aphids after bloom. No aphids in the spring? No need to spray. If you see aphids in the orchard after bloom, you can use a range of pesticides for good control. Talk with your packer regarding which pesticide residues are accepted in the market. Talk with your PCA about materials that give good aphid control without flaring mites. Recent registrations of effective in-season aphid sprays include BeLeaf[®], Actara[®], Assail[®], and Provado[®] (and generics).

What won't a fall spray do? A fall spray is for aphids, only. It gives some peach twig borer control, no scale control, and has no effect on bloom timing. To find out if you need to control scale, take a dormant spur sample. See <http://www.ipm.ucdavis.edu/PMG/r606900511.html> or call your UC farm advisor for details on dormant spur sampling.

A fall spray for prune aphid control is a solid option for growers without a scale problem who are looking to control a regular aphid problem. A fall spray provides good aphid control with low cost and little hassle (no mud) while avoiding in-season spray issues such as complying with "no spray" lists and flaring spider mites.



Prune out Cytospora cankers to reduce disease

Joe Connell, UC Farm Advisor, Butte County

Franz Niederholzer, UC Farm Advisor, Sutter/Yuba Counties

Dormant pruning renews fruit wood, moderates a heavy crop, and reduces limb breakage, potassium deficiency, small fruit sizes and high dry away ratios. It is also the first step toward eliminating cytospora cankers and the dead wood associated with them. To identify limbs killed or weakened by cytospora cankers, look for dark, sunken cankers on the bark of limbs showing dieback or branches where dead leaves are still attached. Cankers will have distinct zonate margins (Figure 1) that are different from the streaking and flecking in the tissue that is characteristic of bacterial cankers. Small white spots called pycnidia found on dead wood will confirm the presence of *Cytospora*.

Pruning out diseased limbs and burning them will reduce disease pressure and spores that can spread disease to new wood next season (Figure 2). Be sure to cut into healthy wood several inches to one foot below any canker symptoms. Check the cut surface of damaged limbs to ensure that all disease has been removed (Figure 3). Incomplete canker removal wastes time and money and won't control the disease. In older blocks where cytospora is a real problem, consider using a specially trained pruning crew dedicated to identifying and cutting out the entire cankers.

Cytospora canker is a weak pathogen caused by the fungus *Cytospora leucostoma* that's spread by wind and rain to bark damaged by other stresses. To minimize this disease and the loss of fruit wood, scaffolds, and potentially entire trees, avoid in-season stress factors that predispose prune trees to disease spread such as potassium deficiency, water stress, sunburn, and subsequent borer attacks. The fungus shows maximum growth in hot temperatures around 90°F and is particularly active in late summer to early fall. Trees planted on shallow and/or heavy textured (clay) soils are generally more likely to suffer economic damage since the disease spreads more rapidly in water stressed trees.

There are no chemical controls for cytospora cankers. To manage infection and reduce disease spread, avoid tree stress and remove cankered wood from the orchard and burn it. Prune to minimize sunburn potential, and, paint exposed trunks and scaffold crotches with white interior latex paint to further protect them from sunburn. Maintain adequate orchard water status, especially after harvest, and avoid potassium deficiency, spider mite or prune rust defoliation that can increase sunburn and disease potential.

For more detailed information on disease management and for excellent photos of disease symptoms and fungus signs that will help you know what to look for, visit the IPM web page (www.ipm.ucdavis.edu) and click on Agriculture and floriculture; Prune; and cytospora canker (under diseases).

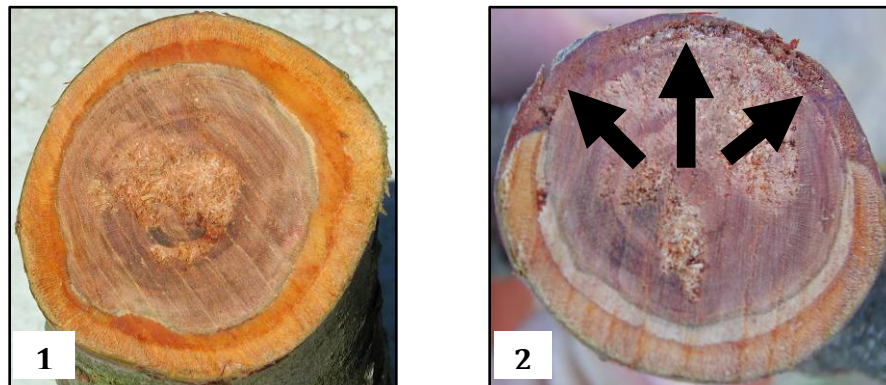
Figure 1. Cytospora cankers are detected as sunken areas on the branch where bark has been killed. Arrows point to canker edges, revealed by a knife cut in the second photo.



Figure 2. Pycnidia, black or white pimple-like spore producing structures found on dead wood.



Figure 3. Good cut (1) below canker showing only clean bark. Bad cut (2) not far enough down showing diseased bark (arrows) and canker remaining in the tree.



Cost saving spray practices for fall prune aphid spray

Franz Niederholzer, UC Farm Advisor, Colusa/Sutter/Yuba Counties

Recent UC research shows that – for fall sprays in prunes– faster tractor speed, lower fan gear, and tractor engine settings can save money while delivering excellent aphid control and reduce pesticide drift out of the orchard. This work was conducted in Sutter County with leadership from Dr. Ken Giles, UC Davis and Jim Markle, CURES.

In two separate years and commercial orchards, 2010 and 2011, two different sprayer set-ups were compared for prune aphid control and cost savings at an early November spray timing. We used a John Deere Model 5105ML tractor (Thanks to Valley Truck and Tractor Co.) and a Slimline Manufacturing TurboMist S30P600S sprayer with a 600 gallon tank and a diaphragm pump. Pesticide material and rate was original Warrior (11.4% a.i.) at 3 oz/acre. Every row was sprayed. The sprayer set ups were as follows:

Treatment 1:

- 2.5 MPH ground speed
- 100 gallons per acre spray volume, 150 psi sprayer system pressure
- 2100 RPM on tractor tachometer -- 540 PTO speed
- “High” gear setting on the sprayer fan
- Standard TeeJet nozzle sizes (D4/25 & D6/25) with 2/3 of spray volume delivered through the top half of the open nozzles. Nozzles were targeted to the tree.

Treatment 2:

- 4.0 MPH ground speed
- 100 gallons per acre spray volume, 150 psi sprayer system pressure
- 20% reduction in tractor engine speed: 1650 RPM tractor -- 420 PTO speed
- “Low” gear setting on the sprayer fan
- Larger TeeJet nozzle sizes (D6/25 and D12/25) were used to maintain the same spray volume/acre (100 gpa) using the higher ground speed compared to Treatment 1. D12 nozzles replaced the D6 nozzles and D6 nozzles replaced the D4 nozzles used in Treatment 1 at the same locations on the spray booms.

Spray time per acre and diesel use per acre were measured in 2010 and 2011, and spray drift was measured in 2010. The fields were scouted for prune aphid in April/May the following year.

No difference in aphid control between the two sprayer setups was observed in either year. Spray movement (drift) out of the orchard was reduced by 80% using Treatment 2 compared to Treatment 1.

Spraying with Treatment 2 used roughly 1/3 less time and half the diesel used in Treatment 1.

Caution: These practices have not been tested in any other spray timing. I would not try this approach to spraying prunes at any time after bud break, certainly not after petal fall. Conduct a small test in your own orchard before any large scale changes are made to a proven spray program. It may not be possible to reduce engine speed and maintain the same sprayer system pressure in all sprayer makes and models.

Two Different Spots on Prune Leaves

Richard P. Buchner – UC Farm Advisor, Tehama County

Each year farm advisors get questions regarding yellow prune leaves with what appears to be “green spots” (figure 1). These “green spots” do not sporulate and are not disease related. Symptoms usually show up in early summer and can be confused with rust lesions. Leaves with “green spots” are typically found on stressed trees or in areas of the orchard that are more prone to stress. Consequently, the cause is thought to be physiological. Sometimes “green leaf” is diagnosed as rust and a sulfur application is made just to be safe. This is probably not a good decision as sulfur is detrimental to predator mites that can help prevent spider mite damage.

Prune rust (figure 2) caused by the fungus *Tranzschelia discolor* may develop any time from late spring to autumn following rain or high humidity. The first evidence of a rust infection is small yellow angular lesions on the leaf surface. Later, when the fungus sporulates, a rusty reddish/brown pustule develops on the lower leaf surface within the angular lesion. Sporulation confirms the rust fungus.

Leaves with multiple rust infections yellow and drop making early defoliation the major problem associated with rust. Reductions in leaf area make it more difficult for the tree to mature the fruit and increase fruit sugar content. Prune rust is notorious for its explosive capacity to become epidemic. The spores can germinate and infect within hours when free moisture is present or the relative humidity is 100%. Rainfall in late spring through summer sets the stage for outbreaks and rust can be exacerbated by morning dews and high humidity. In the Sacramento Valley start monitoring for rust on May first. Monitor trees weekly and treat immediately if any rust lesions are found.



Figure 1 Yellow prune leaves with green spots that do not sporulate are thought to be related to tree stress.



Figure 2 Prune rust lesions on the upper and lower leaf surface. Rusty reddish/brown spores on the lower leaf surface confirm rust.

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