Sacramento Valley Prune News
Fall, 2018
University of California
Agriculture and Natural Resources | Cooperative Extension

In This Issue

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Fall & Winter Prune Orchard Management Considerations

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PRUNING

- ✓ Avoid pruning immediately prior to rainfall events. Consider following pruning with a fungicide spray (Topsin-M® or Topsin-M + Rally®) to protect the fresh wounds from infection from rain-splashed spores.
- ✓ When pruning, ensure you have entirely removed existing *Cytospora* cankers by cutting several inches to a foot below the symptoms. Information on identifying cankers and photos of a "clean" pruning cut can be viewed at sacvalleyorchards.com/prunes/pruners-pocket-guide-for-cutting-out-cytospora
- ✓ Remove and burn (if permitted) prunings to reduce in-orchard inoculum levels.
- ✓ Skipping pruning for a year is a significant cost-savings but be prepared to shaker-thin if needed next spring. The savings on pruning may turn into a net-loss after setting a large crop of small fruit and suffering increased sunburn and broken limbs. Use careful nitrogen fertilizer management to avoid pushing vigorous growth and increasing pruning time and cost in the pruning year.

NUTRITION

- ✓ Soil applied potassium (K) should be banded in the fall. One dry ton of crop removes 26 lbs of potassium from your orchard. A common maintenance rate is 400-500 lbs/ac of K fertilizer (potassium sulfate). Growers can also opt to apply fertilizer K through irrigation system (fertigation) and/or multiple foliar applications once a crop has been set.
- ✓ Foliar zinc (Zn) applied as zinc sulfate can be applied at beginning of leaf drop (late October/early November). 20 lbs of 36% zinc sulfate at 100 gallons water/ac may also hasten leaf drop, reducing risk of blow over and/or disrupt aphid reproduction.
- ✓ Tree nitrogen (N) uptake is limited in the fall (there is nothing to feed) and trees will not take up N once leaf drop has begun. N should not be soil applied after September to avoid N leaching by winter rains.
- ✓ A fall foliar nitrogen (N) spray of 10-20 lbs N/acre may help reduce bacterial canker incidence next spring in young orchards, especially if summer leaf N levels are low.

INSECTS

- ✓ **Aphids.** Fall and winter preventative management for aphids can be an effective and ideal time to treat orchards with a history of problems, particularly if no dormant sprays will be applied for scale or peach twig borer. Consider treating

orchards with a history of aphids in October through early December while orchards are still dry. Low rates of pyrethroids have been shown to be effective when applied between mid-October and mid-December. Into late October, neonicotinoids can be effective fall treatments. Once leaves have dropped, neonics will not be effective. Avoid organophosphates for a fall spray, as these have not been shown to be effective at this time. Oil is not needed in a fall aphid spray. Treating aphids in the fall, or during the dormant season in conjunction with scale/PTB treatments, has less impact on natural enemies than spring aphid treatments. Not every orchard needs to be treated for aphids. Rely on orchard history and obtain a dormant spur sample looking for eggs if fall treatments were not applied. Visit sacvalleyorchards.com/prunes/ for three detailed articles on prune aphid management. Fall aphid sprays are not effective for scale or peach twig borer populations.

- ✓ **Scale.** Obtain a dormant spur samples looking for San Jose scale and European fruit lecanium, as well as evidence of parasitism in both species. You can also scout for aphid eggs and European red mite eggs in this sample. San Jose scale can be effectively controlled in the dormant season with oil alone (low-moderate populations) or oil + an insect growth regulator (moderate to high populations). Oil alone is effective if European fruit lecanium populations are moderate to high. With either species, if significant parasitism is noted, treatments may not be necessary. More information on dormant sampling and treatment thresholds ipm.ucanr.edu/PMG/r606900511.html.
- ✓ **Peach twig borer.** During the dormant period, a moderate rate of pyrethroid is effective on aphids and PTB (6-8 oz/acre of Asana) without the need to use the max labeled rate (14+ oz/acre). Adding 3 to 4 gallons of oil (440 narrow range oil) per acre to the tank will help control scale, but avoid oil when trees and/or soil are dry. These rates of oil, applied in late December or through January, will also advance bloom several days, depending on weather conditions at spraying and bloom. When nearing bloom, avoid applying any insecticides (aside from *Bacillus thuringiensis*, Bt) once bees are active in the area).
- ✓ Visit sacvalleyorchards.com/prunes/insects-mites-prunes/aphid_management/ for a table of timing, efficacy, and other considerations for treatment of these three pests.

WEEDS

- ✓ Conduct a post-harvest weed survey (ipm.ucanr.edu/PMG/C606/prune-fallweeds.pdf) to evaluate your 2018 weed control program efficacy.
- ✓ Pre-emergence herbicide (combined with a post-emergence burn-down material, if winter weeds have already germinated) should be applied shortly before a moderate rain event (0.25") to move material into the soil. Avoid application prior to a large rain event (> 1"), which can move the product too deep into the soil for good weed control. Avoid spraying root/trunk sucker leaves with any spray containing systemic herbicides such as glyphosate (Roundup, etc.) since those herbicides can enter the tree and cause damage next spring.

GOPHERS

Late fall to early winter is prime gopher control timing because populations are generally lowest at this time of year. See gopher control strategies at: ipm.ucanr.edu/PMG/r105600211.html

Cytospora Post-Harvest: Cut it out! Protect fresh cuts!

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Themis Michailides, UC Davis Plant Pathologist and Lecturer

Cut it out!

Cytospora is a major pest of prune trees, killing bearing wood, reducing yield potential and even killing trees. It is a fungal canker, meaning a fungal disease of the bark (see figure 1). This canker disease is perennial, so once the fungus has successfully infected the bark, it can continue to grow **every** year, resulting in branch girdling and even tree death. This disease is widespread in prune orchards in California. It is present, to some degree, in every mature prune orchard the authors have ever visited. To minimize damage from this disease, several important steps must be taken.

Figure 1. A clearly delineated *Cytospora* canker (brown dead bark; pruning wound infection) in young prune orchard with widespread infection (fall 2018, photo by Franz Niederholzer).

During the post-harvest period, two key management practices in orchards with *Cytospora* are to avoid tree water stress by carefully managing irrigation and pruning out existing cankers. Cutting out existing cankers should be performed during the growing season when enough leaves are still present to easily identify these girdled branches. Leaves on these branches are likely either in decline or dead and remain frozen in place. These branches with sunken cankers should be cut several inches, to one foot below any cankered bark (check for darkened edges, see figure 2). If the canker is not completely removed, the disease is still in the tree, and money is wasted. To reduce disease inoculum, remove and destroy cankered wood that is pruned out, as well as trees killed by *Cytospora*.

Pruners should be trained to spot *Cytospora* canker and to cut below the symptoms. In our experience, pruning crews are often loath to make the extensive cuts required to remove *Cytospora* cankers. Therefore, growers, managers and/or PCAs should monitor pruning cuts or downed wood to make sure pruners are making clean cuts – not leaving *Cytospora* in the trees – as they move across the block.

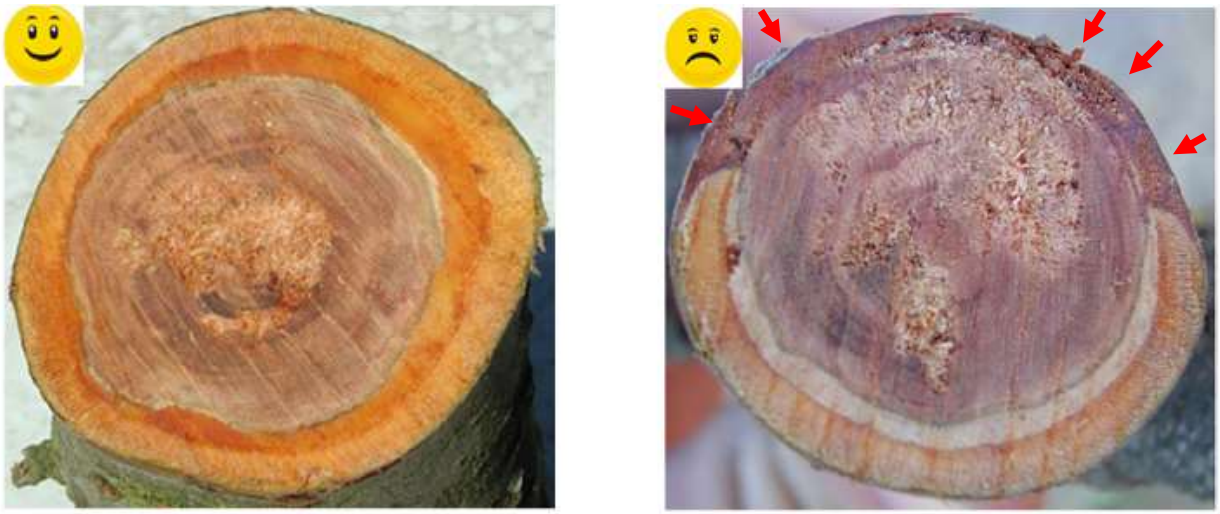

Figure 2. A clean cut (left) where the bark margin is healthy. Cut several inches to one-foot past cankered regions (right) identified by sunken and darkened bark (arrows).

For the printable Pruners Pocket Guide for Cutting out *Cytospora* please see:
sacvalleyorchards.com/prunes/pruners-pocket-guide-for-cutting-out-cytospora/

Protect fresh cuts!

Cytospora spores are carried in wind and/or rain and move to new infection sites (sunburned scaffolds, pruning wounds, etc.) in wet and windy weather. The post-harvest pruning period is a key opportunity for **avoiding** new infections. Whether making mechanical cuts or pruning with loppers, fresh cuts are susceptible infection entry points for rain-splashed fungal spores from *Cytospora* as well as other fungal diseases like *Botryosphaeria*. Work by the lab of Dr. Themis Michailides, UC Plant Pathologist, has shown that fresh pruning cuts remain susceptible to rain-splashed fungal infections for at least 30 days.

Spraying with protectant fungicides such as Topsin®-M, or Topsin®-M and Rally® WP after pruning and before any rainfall can reduce canker infection. These two fungicides now have a 2EE label for treating pruning wounds in prunes, as well as almonds, other stone fruits and grapes. While the efficacy of Rally® WP alone hasn't been evaluated by UC researchers, when paired with Topsin®-M it does offer a different FRAC group for improving resistance management. Always carefully read and follow the pesticide label. Cutting out diseased wood and protecting pruning wounds with fungicide(s) will help reduce the level of *Cytospora* canker in prune orchards, thus improving yield and future orchard income.

More information on these fungicides can be found at:

thealmonddoctor.com/2017/12/11/controlling-pruning-wound-infections/

Pros and Cons of Mechanical Pruning

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Some prune growers are adopting mechanical pruning as an alternative to standard hand pruning of **mature, bearing trees** as labor costs climb and labor availability drops.

The cumulative result of this style of mechanical pruning is unclear and should be studied. However, some generalized pros and cons can be gleaned from UC research and grower experience.

Pros of Mechanical Pruning:

- **Cost:** Some growers report that standard hand pruning can cost approximately $1000 per acre, while a mechanical hedging and topping program may be closer to $250 per acre.

- **Availability:** We are hearing reports that pruning crews are not available in some areas at any price, and if they do start an orchard, may not stay to finish the job.

- **Total Value:** A 2006 to 2009 UC study evaluated various timings (June, September or dormant) for mechanical pruning treatments (flat topping, angled canopy "V" or "mohawk" cuts, etc.; treatments included large thinning cuts and no hedging). In this trial, the standard hand pruning treatment had lowest cumulative economic value compared to a range of topping cuts, indicating potential for economic gains from moving to a program that includes at least some mechanical pruning.

  For more on this study see: sacvalleyorchards.com/prunes/pruning-prunes-hand-vs-mechanical-pruning/ Read the annual report from this project (CPB 5) and other research on pruning at: ucanr.edu/sites/driedplum/show_categories/General_Pruning/.

For this discussion:

Mechanical pruning: a 'boxed' treatment applied every year, consisting of mechanical topping plus two-way hedging during post-harvest. Includes some hand cuts for removing suckers, diseased and dead wood.

Hand pruning: selective cuts made annually with loppers and the assistance of ladders. Includes a mechanical topping every other year to reduce labor costs.

Cons of Mechanical Pruning of Mature* Orchards:

- **Disease risk:** Hedging results in thousands of indiscriminate cuts that are potential entry points for rain-splashed fungal spore infection from diseases such as *Cytospora* and *Botryosphaeria* (figure 1). Spraying with a fungicide protectant like Topsin-M® soon after any pruning can reduce the risk of infection (see article in this issue).

Figure 1. A 15-year-old orchard that has been mechanically 'boxed' for seven years showing branch dieback (tree on the right). The orchard manager had not previously protected pruning wounds with a fungicide but plans to start this year.

- **Reduced fruitwood thinning**: Mechanical hedging doesn't selectively thin fruitwood to improve fruit size. Instead, shaker thinning, as needed, is relied on to achieve good fruit size. Reduced fruitwood thinning may also result in fruit on positions that are more difficult to shake such as long "hanger" spurs. If a grower is going to stop detail pruning in an orchard, estimating fruit per tree and shaker thinning --where needed-- will be essential to avoid growing a big crop of small, low value fruit.

- **Unknown long-term results:** This 'boxed' style of mechanical pruning has not been evaluated by UC researchers. Despite anecdotal grower success, long-term results on yield, dieback and overall orchard longevity are unknown.

Differences in equipment, orchard design and grower preference make for many ways to "mechanically prune". Be aware of the challenges and potential benefits of shifting away from ladders and loppers as labor becomes more expensive and less available. We encourage you to talk with neighbors, industry reps, PCA/CCAs and your local UC farm advisors when developing a pruning program this fall.

*We are unaware of any growers who have eliminated hand pruning of young trees. Careful hand pruning is still needed to develop trees that will carry good to heavy crops year after year for the life of the orchard.