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Submitted by:

Franz Niederholzer,
UC Farm Advisor
UCCE Sutter-Yuba and
Colusa Counties

Date	Event	Location	Contact
November 15	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Bldg.	822-7503
December 1	UCCE/SCAC* spray meeting	Sutter Co. Ag Bldg.	822-7503
December 6	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Bldg.	822-7503
December 8	Sutter County Ag Commissioner (SCAC) Grower Meeting	Sutter Co. Ag Bldg.	822-7503



Practices to consider in prune orchards this fall

- 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.
- Clean up orchards:
 - Cut out *Cytospora* cankers. See more information on-line 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.
- Irrigation: If it is a warm, dry fall consider irrigating a second time after harvest once soil or tree moisture monitoring shows the orchard needs water. *Cytospora* cankers run faster in water stressed trees, and there is some evidence that prune trees receiving no fall irrigation produce smaller buds. No rain is in the weather forecasts stretching into the first week of October.
- 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:** Consult with your PCA regarding your options for prebloom pest (scale and aphids.) You have more options than just a dormant spray.
 - ❑ Do you have a scale problem? Take a dormant spur sample between November and January. Details at: <http://www.ipm.ucdavis.edu/PMG/r606900511.html>.
 - ❑ A light rate of pyrethroid (Asana®, Warrior®, etc.) or diazinon pesticide controls aphid (only) next year. Adding oil is not necessary. Pyrethroids work from November to end of February. Diazinon works best between December 1 and end of February.
 - ❑ A full dormant spray (oil + pesticide) controls scale (and peach twig borer + aphid) when a significant scale population is found in the dormant spur sample. A February timing is better than December or January for scale control. Oil alone will control low to moderate scale populations.
 - ❑ Peach twig borer (PTB) can be controlled by use of bee-friendly pesticide (Dipel®, Intrepid®, etc.) mixed with bloom fungicide(s). These materials and timing are as effective as dormant or delayed dormant sprays for PTB control.
- ❑ **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>).



New Prune Rootstock Research is Underway

Carolyn DeBuse, UCCE Farm advisor, Solano and Yolo Counties

It has been a long time since a rootstock research project has been undertaken for prune. The prune industry has been lucky to have a small selection of durable, proven rootstocks that have worked well enough. There is hope that we can find a better rootstock for many of the problems the industry faces such as excessive suckering, poor anchorage, soil borne nematodes and fungal pathogens. UC Cooperative Extension advisors and specialists have initiated a rootstock research project to look at rootstocks that have been imported from other countries or bred for *Prunus* species but not yet tested in the California climate with French prune.

The project consists of two large replicated trials of the most promising rootstocks placed in growers orchards and one smaller trial of rootstocks that may have a possibility but have had very little testing until now. The rootstocks to be tested in the large trials are M30, M40, M58(all three are from the Marianna plum series), HBOK 50(Peach), Krymsk 1(plum hybrid), Krymsk 86(peach/plum hybrid), Rootpack

R(plum/almond hybrid), and Empyrean 2(European plum: *P. domestica*). These are being compared to currently grown rootstocks – Myro 29C, M2624, Myro seedling, and Lovell seedling. The large rootstock trials were planted this spring in Yuba and Butte Counties. In following years, we'll provide research updates on these trials as we observe effects on anchorage, tolerance to Bacterial Canker, nematode resistance, compatibility, yield and fruit quality, and overall performance.



Considerations when removing prune orchards

Joe Connell, UC Farm Advisor, Butte County

If you're removing an old prune orchard to replant prunes or if you're taking out a block with plans to convert to another orchard crop there are some things you should consider before the trees are removed. We know that Sacramento Valley prune orchards are primarily hosts to ring and root lesion nematodes (*Criconemoides xenoplax* and *Pratylenchus vulnus* respectively). These nematodes can affect establishment of a new prune orchard since high ring nematode populations aggravate the bacterial canker problem in young trees.

The root lesion nematode can be especially problematic if a prune orchard is removed and the new orchard is planted to walnuts. Walnuts are an excellent host for root lesion nematode and this nematode will stunt the growth of new walnut trees if populations are not controlled. If root knot nematode (*Meloidogyne incognita*) is present in the prune orchard, following prunes with an almond orchard planted on Krymsk 86 rootstock could also be problematic since this rootstock is especially susceptible to root knot nematodes. Sampling and diagnosis for the presence or absence of nematodes should be done **before** an existing orchard is removed. Having a nematode test done on soil sampled from a site will help inform your decisions about how to remove the existing orchard and what needs to be done before replanting the specific block. Nematode soil pests can persist for the lifetime of the orchard and must be dealt with when replanting. Instructions for soil sampling for nematode testing can be found at:

<http://www.ipm.ucdavis.edu/PMG/r606200111.html>.

Dr. Michael McKenry, Nematologist at the UC Kearney Agricultural Center, has suggested that starving an existing nematode population by killing the complete root system before stumps are pulled out and switching to an unrelated rootstock can help with the replant problem and potentially reduce nematodes. To employ this strategy, harvest fruit as soon as possible, then, before mid-October, irrigate deeply, sample for nematodes, cut off old trees at trunk level, and apply a systemic herbicide to the cambium on cut trunks. Used this way, glyphosate will effectively kill prune roots. Wait at least 60 days before removal of the old treated tree trunks. Then, it's essential to wait for at least one full year (12 to 18 months) before replanting to minimize the replant problem. The longer the period the greater the likelihood of success. This herbicide treatment will not reduce populations of root lesion or other nematodes living in the soil, only those within roots. It effectively removes the roots as a food source for nematodes. The ring nematode, if prevalent in a potential bacterial canker site, can be reduced in number without causing a biological vacuum by growing sorghum x sudangrass for one full year.

Adequate nematode control is accomplished by fumigating the surface five feet of soil profile. Spot treatments at tree sites or strip treatments 8 to 12 feet wide will only provide one year of nematode relief. If root lesion or ring nematodes are considered to be a future problem, solid fumigation should be employed or expect to treat the new orchard annually with post-plant nematicides. For more information refer to Dr. McKenry's website at:

http://www.uckac.edu/programs/Nematodes/IPM_guidelines_for_replanting/

Prune Orchard Fertility Review: Focus on the “Key 3”

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

Fall is a good time to review the past season and plan for the next. What was new or different this past year? What are the basic inputs required to maintain high yields and return a profit?

Some things don't change. Adequate prune orchard mineral nutrition is critical to maintaining high yields and good orchard health. Focus on maintaining the “Key 3” – nitrogen (N), potassium (K), and zinc (Zn). Although in certain orchards other elements may be important based on local conditions, adequate N, K, and Zn are needed across the region for good prune orchard yields.

Some things do change. Fertilizer costs are up. Prune prices are steady to dropping. Maintaining good return on your fertilizer investment is key to staying profitable. Don't pay more for fertilizer than you need.

Here's a quick prune orchard fertility review, in order of importance to prune production.

Potassium (K) is the most important mineral nutrient in prune production. Prune fruit accumulate potassium steadily from bloom through harvest. In July and early August, as root growth slows and soil moisture is used rapidly, tree K uptake may decrease. However, fruit K needs are unchanged and fruit “pull” K from the rest of the tree, especially leaves. This causes leaf K content to drop, risking potassium deficiency if leaf K levels were not high enough going into summer. Potassium deficiency starts a devastating cascade of trouble -- potassium deficiency → leaf scorch and drop → sunburn → *cytospora* infection → leading to limb or scaffold death and → a loss of orchard production that can last for years. Keeping adequate potassium in a prune orchard is essential to sustainable production.

Prune fruit need a lot of potassium. Prune orchards with a heavy crop need a lot of potassium. Traditional University of California annual K fertilizer maintenance programs suggests 400-500 pounds of potassium sulfate (0-0-50; sulfate of potash) per acre banded in the fall in orchards that are solid set irrigated or shanked in where orchards are cultivated or flood irrigated. Orchards with well drained soils that receive significant winter rains can use potassium chloride (0-0-60; muriate of potash) at about the same rate. Those rates cost \$200-220/acre in today's market – a huge amount of money to ante up before you know what your crop will be like the next year.

Alternative plans to a big slug of K in the fall are 1) injecting potassium fertilizer through drip or micro-sprinkler irrigation lines in the spring and summer, 2) a steady foliar program of a minimum of the equivalent of 100 pounds of KNO_3 /acre or 3) some combination of option 1 & 2. In season K fertilization allows growers to check the crop size before putting on any K fertilizer. A light crop may require very little if any K fertilizer.

Traditional fertilizers such as ground applied potassium sulfate and foliar applied potassium nitrate are proven effective. Be careful when looking at new products, as those have risks as well. Here are some examples...

- Potassium thiosulfate (KTS, 0-0-25) is an effective liquid fertilizer that can be injected through micro-irrigation systems. However, high rates of KTS (more than 10 gallons/acre/application) can damage or kill trees depending on the orchard conditions.
- Alternatives to KNO_3 for foliar K fertilization are available in the market. Many are liquids that are easier to mix than solid fertilizers. Potassium nitrate (KNO_3) is a good, efficient foliar fertilizer that won't burn leaves when applied at reasonable rates (20-25 lb KNO_3 /acre in 100 gallons. When using liquid potassium foliar fertilizers to replace KNO_3 in a spray-only program (no soil applied K fertilizer) in an orchard carrying a good crop, use the amount of material equivalent to 100 lbs of

KNO_3 /acre/season. Multiple sprays will be needed, just as in a KNO_3 program. Otherwise you run the risk of under supplying your orchard with potassium.

A solid potassium fertilizer program is a cornerstone of a good prune orchard management program. Cutting corners with your potassium fertilizer program can put the health of your orchard at risk.

Nitrogen (N) is essential for good prune production and tree health. Nitrogen deficient prune trees make fewer flowers and therefore set smaller crops. Prune trees with low N levels are more susceptible to bacterial canker than trees with adequate levels of N. Trees store N over the winter in woody tissue to use in spring growth. An orchard with a good leaf N level in July leaf samples (good storage reserves) shouldn't need N fertilizer until mid-April the next year once the crop can be checked. Light crops mean less N fertilizer need, much like K. If July leaf N levels are low, an application now, before trees go dormant, may be warranted. If you plan to do this, remember that trees have limited N storage space and that once leaf drop occurs, prune trees don't absorb N from the soil. If you are going to apply fertilizer N now, use low rates (<50 lb N/acre) and get it on early (not later than September).

Zinc (Zn) is important to healthy growing points in plants. Bloom thru spring is the time when the most growing points are found on plants and so is the period of highest zinc demand. To meet this timing need, zinc is usually applied as a foliar fertilizer in the fall or spring. A high rate (20+lb/acre) of zinc sulfate ((36%) sprayed in the fall once natural leaf drop begins delivers zinc to prune trees and removes leaves. In my experience, early defoliation following a fall zinc sulfate spray won't occur if the orchard is dry. A good alternative to a high rate of zinc in the fall is 4-6 lb/acre 52% zinc (neutral zinc, etc.) in the spring, preferably before leaves reach full size and no later than mid-May. There are many different zinc foliar materials. Many effectively move zinc into trees, but cost and risk of phytotoxicity vary from product to product. Talk with your PCA about the most cost effective options that supply sufficient elemental zinc.



Prune Research Reports Now Available on the Internet

Prune research reports from 1961 – 2010 are now available, free, on the internet at:

<http://ucanr.org/sites/driedplum/>. Are you curious about aphid management or potassium nutrition? Type "potassium" or "aphids" into the search "box" on the site and hit the "search" button. Not sure what topic it is you want – potassium, potash, fertilizer, or nutrition – click on "Reports by Category" to see all the categories in the data base. Want to see all the reports from a certain year? Click on "Reports by Year". This valuable web resource was supported by a grant from the California Dried Plum Board to the University of California, Davis Fruit and Nut Research and Information Center with support from the UC ANR Communications Information Service Center.



Short, timely prune updates available on Twitter

Short (less than 140 characters), free, timely updates on prune production in the Sutter/Yuba region are available at www.twitter.com/prunedoc. Topics include weather changes, pest pressure and fruit growing conditions. If you have unlimited texting on your cell phone plan, getting these messages on your cell phone won't cost you extra. I average about 4-8 messages posted per month this summer.