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Kern Pistachio Notes

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Smiling Trees

At some point during the first year after planting a new rootstock and budding it, the new scion shoot is cut at a height of about 42 inches above ground level. Immediately below this tree-training cut we want four or five vegetative buds to push. Below this area of pushing buds we want a straight, strong single trunk to develop. With diligent training, the shoots from these buds will eventually form the primary scaffold branches for the tree. As the recent low-chill years have shown, it is not always possible to get four or five nice buds to push. Generally, growers are happy if they get three of four nice candidate shoots. Sometimes we only get two. When a tree canopy is supported by only two primary scaffolds, one-half of the entire tree canopy rests on a single scaffold branch. It is not uncommon for trees in their early-bearing years when the crotch is of relatively small diameter, and which have only two primary scaffolds, to split where the scaffold branches come together at the trunk. The problem with forming a large tree from only two shoots is that branches, leaves and nuts are heavy. Additionally, the leaf canopy can act like a giant sail, catching the wind, and putting additional stress on the crotch of the tree. Harvest shaking is another potential hazard to two-scaffold trees, and a tree collapsing at harvest can pose a danger to the harvesting crew.

When the trunk starts to split at the crotch, at least one very experienced pistachio grower says the tree is 'smiling.' Often the trees will produce gum/resin at the smile and the wood will blacken in the crack as a result of secondary fungal infections. If these 'smiles' are not 'fixed' the trunk will continue to split and one-half or all of the tree may be lost. One way to fix these trees is by bolting them back together below the smile. Trees that have a split in the trunk as long as 12 inches or more may require more than one bolt. Dirt and leaves should be cleaned out of the split as well as possible before bolting. Growers have used threaded rod, 1/2 inch in diameter, as the 'bolt'. Threaded rod can come in lengths as long as 10 feet. A long bit (commonly called an electrician's bit) is used to drill the hole perpendicular to the smile for the threaded rod. A piece of the rod of sufficient length is placed through the hole and cut, leaving sufficient length for the large-diameter heavy washers and heavy nuts that are threaded and tightened on both sides of the tree. The edges of the wound can be treated with a wood sealant (grafting wax for example) to reduce water and dirt from interfering with the tree recovery. It is best to catch the trees when they first begin to smile. If fixed successfully, the tree will eventually completely overgrow these bolts. A down side of fixing trees in this fashion is that these buried bolts may present a hazard to future workers (and cutting blades) that may be involved in using mechanized saws or shredders to remove these trees at some future date. Obviously, workers should be trained on potential hazards, including this one, associated with tree removal in orchards. Some growers buy stakes, to help prop up sagging branches, and remove some stress on the crotch of the tree. The stakes can complicate harvesting, but may save the tree.

With the potential large nut load this season, in combination with the vigorous branch growth that I am seeing across the industry in Kern County this year, I expect that a lot of tree trunks will split and scaffolds will break as this season progresses. Depending upon your way of looking at things, there may be an upside to all of this tree smiling. A nut yield heavy enough to get your trees smiling will probably have a lot of growers smiling, too, at harvest time.

Tree Crop-Load Adjustments

I do not believe I have ever seen as much yield potential across the industry in Kern County as I have this year. This year, at this time, trees have an unusually large number of clusters and each cluster has a lot of nutlets. Realistically, however, there is no way these trees can fill all of those nuts. We have all of the necessary conditions for the tree to drop a large percentage of the initial nutlets that begin forming shortly after bloom. A high cluster count means fewer nuts per cluster will reach maturity in each cluster. The nice thing about having lots and lots and lots of clusters on the tree, however, is that even if we harvest fewer nuts per cluster, we retain a high probability for excellent crop yields on a per tree basis.

Because there are so many potential nuts on the tree, we can expect that all the way through to harvest we will witness what is called 'crop load adjustment.' Crop load adjustment manifests itself by developing nuts (nutlets) shriveling, turning black and falling from the tree. Later in the season, as we get into August, some kernels will stop filling and turn mushy. Crop load adjustment is normal and happens in most perennial nut crops. Symptoms of crop load adjustment are shown in photos 1, 2 and 3.

Photo 1. During crop load adjustment, most of the nuts in a cluster may dry up and drop from the tree.

Nutlets falling, as a result of crop load adjustment, can look very much like bug damage. One way to tell the difference is to look to see if the entire orchard is behaving similarly. Usually bug damage is not uniform throughout the orchard, whereas crop load adjustment is. Also, an orchard should be scouted regularly for the presence of plant bugs. Plant bugs, present in high enough numbers to cause similar symptoms to those seen in orchards in years of high crop load adjustment, should be visible. I often hear that plant bugs, especially the small bugs, get in and out of the orchard so quickly they can't be discovered in time. In actuality, in these cases, the symptoms probably have nothing to do with insects and are the result of crop load adjustment. Insecticides will not correct crop load adjustment and, incidentally, will not kill any guilty plant bugs that have already left the orchard.

Photo 2. A nutlet drying up and blackening as a result of crop load adjustment. Frequently, although not showing in this picture, there may be a small sting-like depression in the center of the blackened area suggesting small bug damage. While small bugs can cause similar symptoms, crop load adjustment is the usual cause, even when the nut appears to have a gummy spot. .

Photo 3. Large nutlets falling early as a result of crop load adjustment tend to curl (in directions shown by blue arrow) toward the acute angle (where red arrow is pointing) that the peduncle makes with the larger rachis stalks. Plant bug damage is located more randomly on the outside of the hull, and commonly, there are multiple areas of the nutlet collapsing due to multiple stings.

Foliar Sprays and Phytotoxicity

California pistachios, generally, are probably the most spoiled and babied pistachio trees in the world. A case in point is our wide-spread use of foliar nutrient applications. Babying is not by definition unwarranted, and if handled judiciously to correct micronutrient deficiency for example, can protect tree health, increase yield and improve grower returns.

Every year, though, some of the foliar applications turn out to be too much of a good thing and phytotoxicity results. The hulls of pistachio, in late April and early May, seem particularly vulnerable. Often, after a foliar application gone amiss, developing leaves show no problems, while the hulls can look terrible. The off-setting news is that the hulls can show extensive surface damage, but often the phytotoxicity does not result in significant yield loss. Nobody is paying for pretty hulls. Nevertheless, fairly frequently this time of year, part of my job involves orchard visits to look at spotted hulls. Usually, upon examining the spots, there is not much I can add to the investigation, and end up asking what materials were applied foliarly recently. This question, generally, is not received with much enthusiasm, and sometimes I suspect that a diagnosis of plant disease would be more acceptable. And so it goes.

Not to be left out and in an effort to get more actively involved in foliar-related mayhem, I made an effort to create a little phytotoxicity of my own. I mixed together a moderately high dose of a foliar-nutrient with a spreader adjuvant and water. I used a dirty pump-up sprayer and paid no attention to the nozzle or droplet size. I did a poor and hasty job of measuring and dissolving the chemicals. I sprayed the mixture on the tree in early May. My results appear in Photos 4 and 5. Note that the leaves, at least, show no damage.

The pictures (Photos 4 and 5) are worth a thousand words. My take-home message from this effort is that it is always best to read and follow label directions closely when applying foliar nutrients. Tank mixes with multiple materials carry greater risks. Mixing materials in a jar at recommended rates with the water that will be used for the foliar application, prior to application, can provide some insight on how the solubility of each constituent might be affected in a tank mix. Materials precipitating out in the bottom of the jar are <u>not</u> a positive sign. The spray tank

should be clean prior to the application. Ensure that the sprayer is calibrated so that the foliar spray is applied at recommended rates. Turn the sprayer off at the end of the row, before making the turn, so the end trees don't get a double dose.

Photo 4. Hull phytotoxicity as a result of a poorly mixed and applied foliar nutrient spray.

Figure 5. Close up of hull phytotoxicity as a result of a poorly mixed and applied foliar nutrient spray.

Craig Kallsen, Citrus, Pistachios/Subtropical Horticulture Advisor
cekallsen@ucdavis.edu or 661-868-6221