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*September/October Pistachio Task List*

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**Harvest:** It may be a little late this year. Examination of temperature patterns from previous years suggests pistachio maturity is affected more by spring temperatures than summer. Cool springs tend to delay harvest, presumably because the heat units needed for maximum plant efficiency early in the season are not reached. Peach research shows that there are optimal “Degree Growing Days”, in which the carbon accumulated by photosynthesis is directed largely into crop development, and not “lost” in the form of CO<sub>2</sub> from respiration. Excessive carbon lost in respiration during hot springs is the equivalent of lost interest in a compounded interest savings account. Once interest is lost, your total is always less than what it could have been. Evidence supporting my “cool spring” hypothesis is as follows: in 2006, winter chilling was marginal, the spring was cool, the summer was hot, and harvest was about 10-17 days later than normal. In 2007, winter chilling was good, early spring temperatures were unusually warm, but the summer was mild. Even with the huge crop load, maturity was very advanced. In 2008, we had good chilling, the spring was fairly cool, and summer temperatures above 100<sup>0</sup> F. were fewer. Harvest was split, and occurred about 5 days late. The degree days (40<sup>0</sup> F minimum, no maximum) for 2009 are almost identical to 2008 up to August 1. Hence, maturity may be 4-5 days behind. **Keep a close eye on navel orangeworm (NOW) as harvest progresses to avoid damage on blocks harvested after mid-September. Weekly monitoring of split and mature nuts during harvest is a must. The research data shows pistachio worm damage can increase by one-third to one percent per week, depending upon the season. Review of the payment penalty now assessed by most processors for offgrade, including insect, shows how costly wormy nuts become.** Remember- Quality does NOT begin at harvest! While harvesting, be on the lookout for *Botryosphaeria* so that a strike-cutting program can be initiated in the fall, if necessary. A little post harvest water (25-50% of ETC) is advisable for relieving shaker stress and improving nutrient uptake in the fall. Growers with one to two year old trees or trees with marginal zinc levels should foliar apply this nutrient towards the end of October for the purposes of hardening-off young trees and providing zinc for flower development.

**Cultural:** Growers may complain about split percentages this year. Research by Vito Polito, U.C. Davis Plant Sciences Department, indicates shell splitting is caused by the physical expansion of the kernel rather than development of an abscission zone. Split nut percentages are affected by all of the following: low boron and zinc, insufficient water from July 1 to harvest, excessive cool weather during kernel filling, time of bloom, and heavy big bug damage during kernel filling when nuts show no symptoms. Data recently provided by Paramount Farming suggests no correlation between crop load and split percentage at harvest. The year appeared to have more influence. Waiting for increased split percentages at harvest after much of the crop has creamy hulls can backfire from higher stain (especially on the east side of the Valley where *Alternaria* is a bigger problem) and insect percentages. Growers with poor split percentages need to examine their irrigation program during stages 1 (shell development) and 3 (kernel filling). Research by Dr. David Goldhamer shows that split percentages can be improved by inducing regulated plant stress during Stage 1. If you typically have good split percentages, the gain from Stage 1 stress is primarily water savings. Growers can save a minimum of 50% of Etc between April 1 and June 1, and in northern California, irrigation may not be necessary at all during

this period. Split percentages can also be affected by the uniformity of water application. Do not neglect to examine emitter flow or check the basins for high and low areas. There is no question water stress during Stage 3 reduces split percentages. Compare your applied water to the following average water use: July is 9.8 inches, August is 8.3 and the first two weeks in September is 2.8 inches. Deciding when to stop irrigating before harvest is dependent upon weather, disease pressure, soil texture, split development and orchard access. If *Alternaria* pressure is not a factor, water right up to within three or four days of shaking. Unlike almond, pistachio does NOT require an extended “dry down” period to avoid trunk damage by the shaker. In pistachio, it is common to still be irrigating blocks awaiting harvest while shaking.

In addition to inadequate nutrition (zinc and boron), it is my professional **opinion** that the time of bloom and pollination affect split percentages at harvest. In high chill years, pistachio trees have the potential of pushing and blooming early, PROVIDING the weather is favorable. When spring temperatures are warm, bloom occurs early and sharply. This, in my opinion, allows for more uniform nut development and size since they all begin at about the same time. But when spring temperatures are cool and erratic, I believe nut size and expansion reflects this. Consequently, some nuts pollinate late and experience different developmental weather than those setting earlier. These subtle differences affect the AMOUNT of cell division and the RATE of cell expansion during shell development. The result is that some nuts have thinner or smaller shells, which are more prone to premature splitting.

**Diseases and Insects:** Be on the lookout for *Alternaria* and *Botryosphaeria* during harvest. BOT has been very low this season, due to the lack of infection events. However, as leaf tissue ages, its susceptibility to *Alternaria* infection increases due to decreasing sugar content. Look for yellowing leaves, which have black necrotic lesions and spores in the center. Also examine the leaf stem (petiole) and main vein. Rub the area with your fingers to see if some of the black comes off. If so, this is *Alternaria*. Assess how much exists in the canopy and look for small black lesions on the hull tissue. Remember that *Alternaria* DOES NOT kill nut clusters and shoots. *Botryosphaeria* does that. BOT also does not rub off on your fingers when you handle the infected tissue. Leaves uniformly brown low in the canopy can be easily mistaken as *Alternaria* infections when in fact they are simply dying from lack of light or water stress. How do you tell? Look for the black spores that rub off on your fingers! If there are no spores and the leaves are UNIFORMLY brown rather than having angular sections of brown with black spores in the center, they are shoots that have simply shaded out. *Alternaria* can cause economic damage from defoliation and nut staining. Following harvest, you should determine if pruning, irrigation and soil management practices might be modified to reduce the problem. Poor pruning and slow water infiltration are common causes. Consider applying gypsum in June rather than in the winter to improve the surface soil structure. My desire to minimize *Alternaria* infection through good cultural practices is based on the limited materials we presently have registered for this disease and the rapid resistance that develops from their frequent use. *Alternaria* is now resistant to Prestine in orchards with 2-3 years application history.

Do not confuse citrus flat mite or rain damage for *Alternaria*. Several calls typically occur at harvest concerning dried clusters on the tree, which cannot be removed by the shaker. Citrus flat mite causes patches of chocolate brown discoloration on the hull **and** rachis tissue rather than the distinct, round lesions about 1 mm in diameter associated with *Alternaria*. Flat mite discoloration is also only on the surface, so scratch the tissue to see if it is green underneath. Citrus flat mite also does **not** attack leaf tissue and cause black necrotic margins. This tiny, orange colored mite can turn entire clusters brown and render them unharvestable. Citrus flat mite damage can be confused with BOT, BUT flat mite does NOT cause gumming or blackening of the cluster like BOT. Wettable sulfur in June or July is the cure for flat mite. Also, if you are near a dairy, do not confuse fly speck for flat mite!

Do not confuse leaf scorch common on the male "Peters" variety for *Alternaria* or *Botryosphaeria*. Male scorch is thought to be caused by heat and it may predispose the males to *Alternaria*, but this disease did not cause the

initial leaf browning.

**Young Trees:** Budding young trees could also still be done, but by the time you read this (late August) it will be too late to push them by cutting back the rootstock and notching above the bud. Forcing fall buds greatly increases the risk of frost damage by depleting stored food spent on new growth. Instead, after the buds take, begin slowing vegetative growth by cutting back on the water. **Young orchards suffering from fall cold damage has increased markedly because growers are NOT paying attention to this CRITICAL cultural practice, so listen up!!** Most growers observe an early to mid-September irrigation cut-off on first and second year trees to harden them off. Timing the irrigation cut-off requires knowledge of soil water content, plant vigor, and estimated remaining growing time. **It is better to stop them too early than force them too late! September and October is not the time to try and make up for growth lost during the season!** It is much safer and smarter to get them to bed alive and then start off with good vigor next spring. I strongly recommend growers force young trees into dormancy with zinc sulfate 36% at 40 pounds per 100 gallons of water or 10-15 gallons of liquid zinc 12% in 85 to 90 gallons of water. Liquid 12% is manufactured from zinc sulfate dissolved in sulfuric acid. Consequently, it has an acidic pH, which I think does a better job than 36% powder. But alas, no data, just opinion! Check with your crop consultant or other experienced growers for their thoughts.

That's all, folks. Happy harvest!