



**February 2014 PNP Task List**  
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Pistachio growers are out pruning trees, destroying overwintering mummies, finishing up their pre-emergent weed treatments, irrigating, fixing equipment, and deciding on whether or not they should oil for rest breaking or not. We covered the pros and cons of oil last month in great detail, but we are going to discuss it again due to the dry, warm weather.

**Rain and Irrigation:** You have all heard and read about the water situation, so I will not make it any worse by reiterating the seriousness of the severe drought we face this year. If there was ever a year in which California needed a rain miracle it is this one! So, keep it on your prayer list! Every grower should be out checking soil moisture with an auger to verify the readings from whatever instrument you might be using to monitor soil moisture. Although pistachios roots can be found much deeper, we routinely use the upper four feet as the effective root zone. To assist you in determining the present water content of your soil, go to this link on my UC website: <http://cekings.ucanr.edu/files/19006.pdf>. This manuscript is for walnut irrigation, but the appendix describes how to accurately assess soil texture, and how to estimate its present water content using the feel method. I **never** rely entirely on instrumentation for soil moisture assessment. I have to auger to five feet, and using the guidelines described in this appendix, assess water content at one-foot increments with my fingers. In doing this, you will find that the results are rarely ambiguous; the soil will either be moist and easily compressed into a ball that holds together when lightly bounced within the palm of your hand, or it will be so dry you can hardly get it out of the hole with the auger! Even if you irrigated your orchard last fall, most of the effective root zone may be dry now! Growers are therefore applying four to six-inch irrigations now to fill the effective root zone to near field capacity. This optimizes early season root development, and fully hydrates the tree in preparation for bud break. If the dormancy requirement is fully met by mid-February, pistachios could begin showing green tip by mid-March, if the weather remains warm and dry. This makes it all the more important to have water in the profile prior to bud break. Research indicates that fully canopied pistachios use less than 1.5 inches of water from bud break to April 30, so do not be in a big hurry to re-irrigate once the trees have fully leafed out. I will discuss the options for irrigation with limited water next month. However, for now, it is important to get some pre-season water on.

**Chilling Update:** Here is our dilemma; the weather stations all record lots of hours below 45<sup>0</sup> F, the traditional threshold for accumulation of temperatures which contribute to the dormancy (rest) requirement of deciduous tree crops. Based upon the research performed thus far, it is estimated that the Kerman and Peters varieties need about 800 hours below 45<sup>0</sup>F. Using only this criteria, we would conclude that this season is well ahead of last season in chill hour accumulation, since many stations throughout the state have recorded between 800 and 900 hours. HOWEVER, the simple “below 45” model does not take into account the effect of warm daytime temperatures, which have been usually abundant this winter. For those new to the San Joaquin Valley, we used to welcome the appearance of a warm, sun-filled day, since the valley was socked in with such dense fog, that it was literally life-threatening to drive around in it. There were winters where the sun was not seen all day for over two weeks! So, regardless of what has caused the climate change, we are presently experiencing a very different winter weather pattern than 15 years ago. Tree researchers have long known about the negating effects of warm daytime temperatures on temperatures below the 45<sup>0</sup>F threshold. Dr. Ammon Erez and a team of researchers developed a more sophisticated model in the 1990’s to account for this temperature variability, since it was common in their native country of Israel. Known as the Dynamic, or

Chill Portion Model, it calculates chilling hours between 35-55<sup>0</sup>F in units known as “chill portions”. It also accounts for chill portion cancellation from fluctuating warm temperatures. Dr. Katherine Pope, Post Doctoral Researcher at the UC Davis Plant Sciences Department, has been funded by the pistachio industry to test the validity of the Chill Portion Model. Although the results have not been as conclusive as she hoped, Dr. Pope’s data suggest that Kerman pistachios require between 58-60 chill portions to prevent yield reduction from inadequate rest. Thus far, the chill portions accumulated for this season range from 42-46, depending upon location. Therefore, the Dynamic Model suggests that about 70% of the pistachio rest requirement has been satisfied. Interestingly enough, this level of dormancy satisfaction has been estimated by several long-time pistachio growers! The significance of this winter’s warm days becomes evident when the two models are compared over the past five years. The “simple 45” model suggests that this winter has been the second coldest for chilling hour accumulation, while the Dynamic Model indicates it was been the worst in five seasons! We still have another month to go, so log on to <http://fruitsandnuts.ucdavis.edu/chillcalc/index.cfm> to keep track of chill hours for your area.

**What About Using Oil This Year?** The decision depends on the value of harvesting four to five days sooner, the degree of alternate bearing, **the condition and age of the orchard, and whether or not you think you might have suffered cold injury from the December 5-12 freeze.** My oil tests show that six gallons of the 415 oil applied between late January and mid-February worked as well as Volck<sup>®</sup> (a 476 oil no longer available) **in years with sufficient chilling.** I would use at least a 440 oil when chill hours are marginal. In areas with 650 or less hours, I recommend using a 470 oil. Reports from pistachio experts in Kern County suggest mid-January oil applications have been successful in their county. Presently, Helena Chemical and Britz-Simplot both have horticultural mineral oils registered on pistachio. Both companies market a 415 oil, the lightest one used in agriculture. In addition to its Omni 6E 415 oil, Helena also markets “Supreme Oil”, which is a 435 oil (ie, 50% of it distills at 435<sup>0</sup> F). Britz-Simplot is the only company **I am aware of** (meaning that I will get calls from companies telling me about theirs) that markets oil similar in weight to the old Volck<sup>®</sup>. It is called, “PHT 470 Supreme Spray Oil”. Britz-Simplot also has a 440 oil which is OMRI approved. I have documented an average split nut increase in healthy mature trees of about five pounds per tree, and three to four pounds in seven year-olds. An increase was also recorded in highly fruitful six year-old trees (untreated produced 1700 pounds of **split nuts** per acre) but the response was more erratic than in the seven year-old trees. I think treating six year-old trees in a good chill year is pushing it, but do as you wish. **Make sure your trees have good soil moisture before treating! This extremely dry weather is yet another factor to consider in oil application! Salt stress is yet another factor that has to be considered in some orchards. Think about it!**

**Oil application has several drawbacks** including the increased risks of frost damage and Botrytis infections, especially on male trees, during wet springs. These infections can also predispose trees to BOT attack later in the year. Oil also does not solve production problems associated with poor irrigation management, no pruning, insufficient fertilization, low infiltration, and poor pest and disease management. It just helps overcome insufficient chilling hours! **I would also assess prospective orchards for oil treatment for possible cold damage prior to application.** Refer to last month’s task list for a detailed description of the symptoms, but the clear sign of injury is a blackening of the bark tissue with white milky sap exuding from injured bark and cut tissue. **Attempting to force these trees may increase the risk of them being further damaged.** I bold this statement because Mark Anderson, Consultant, notified me of a grower who applied oil to six year-old trees last year, and then reported dead trees randomly distributed in the orchard. Mark said they had blackened bark around the head of the tree, suggesting that they may have suffered cold injury prior to oil treatment. I think the oil either finished them off, or the trees were already cold damaged, but I do not believe that the random pattern suggests that oil was the primary cause for tree loss. Folks! I am not trying to defend my favorite child here! When I registered Volck<sup>®</sup> oil, Chevron made me apply 12 gallons of it in 100gpa on twenty trees, and we never saw any hint of injury. I have personally stood by trees only two years old, and emptied the spray tank on them with oil solutions from my test plots. The only thing they did was break bud 10 days ahead of the untreated trees. Am I saying oil damage cannot happen? Heaven’s no! I am not a crazy man, ANYTHING

can happen! The question is, how many of the conditions **I have told you to avoid** do you have at YOUR ranch?

**Coverage is critical! Sprayer speed must not exceed 2 mph! If necessary, pay the applicator more to insure this! Oil must be stored and handled with great care to avoid breaking the emulsifier off before application. Do not apply if the oil is milky! Oil is NOT registered for rest breaking! It is registered for soft scale control at this time. Therefore you break rest at your own risk!**

**Scale management:** Soft scale should be treated before the “rubber stage”, which usually occurs by the third week of February. Recommended treatment is 4-5 quarts of Sevin XLR plus 4-6 gallons of oil depending on scale severity. Oil alone is probably enough in most situations unless they look like beads lined up on much of the one-year-old wood. Seize 35W or Assail are effective alternatives to Sevin plus oil, and eliminates the rest breaking effect.

**NOW management:** The 2013 crop provided some nasty navel orangeworm problems for the industry. Even if the 2014 crop size is large, grower prices are strongly affected by nut quality. Poor quality puts the processors up against the “worm ropes” as they try to make bad nuts into good ones. Processors are already offering greater 2014 bonus incentives to keep the worms out of the plant. If you do not think quality is critical for your industry, then you are part of the problem, not the solution! Regardless of what others say, I will go down with the ship preaching that winter sanitation is the cornerstone for effective NOW control! It is very important that growers blow the berms and destroy over-wintering nut mummies as best you can to minimize NOW survival. No rain means less natural drop, and I see LOTS of mummies in most almond orchards. This increases migration pressure on our pistachios and could prove to be real trouble! It is preferable to shred knocked mummies, but discing is better than leaving them undisturbed on the orchard floor. This is critical in orchards suffering from high NOW populations. Insect damaged nuts are a major concern to foreign buyers because of their unsightly appearance and greater susceptibility to aflatoxin-producing molds. Sanitation also helps reduce BOT inoculum, which can splash up into the trees during heavy storms. Remember: we want all diamonds in the bags, so the consumer keeps shelling out the shekels!

**BOT management:** During pruning, keep looking for Botryosphaeria. Wood infections remain capable of releasing inoculum for six years! So, if growers do not cut it out during the winter, it will build up and bite you again. I would also collect a couple hundred fruit buds and cut them in half to see if they are black. Black buds are most likely infected with BOT. As you collect them, look for dead one-year old shoots, and black fruit rachises which do not knock off the tree easily. Cut into the base of these shoots or rachises to see if there is a black streak in the limb extending beyond the base. Wood damaged from cold also has a black zone between the live and dead wood, but its margin is very sharp, and it does not run into the limb. Ignoring these symptoms allows inoculum levels to build and overwintering cankers will increase. During wet springs, tremendous quantities of spores will be spread throughout the orchard, so many that even the most intensive fungicide program will be unable to prevent major cluster infection and crop loss. Reduce the threat of this disease by getting rid of as much overwintering infections as possible. Remember, it is a numbers game! The lower the inoculum, the less risk you have of major crop loss. Happy Farming, and we look forward to seeing the American Pistachio Growers in San Diego!