



February 2018 Task List
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Rain and Irrigation: For those readers not in California, it is drier than a petrified doggie log here! Speaking personally, I am shocked at it being the exact opposite of last year. Last year, we were worried that the Oroville Dam was going to break, and ditch water ran into October to reduce regional reservoir capacities. Boy, we sure wish we had those trillions of gallons of fresh water that went into the ocean last year now! This year also reminds us of how blessed we were last year to get some drought relief. How quickly we forget that miracle, and assume that it will simply become the new norm. NOT!

Data as of January 21, indicates extremely low snow water content; the statewide average is only about 12 percent of last year at this time. The snow pack is only about a quarter of the historical average. If it were not for the reservoirs being 10 to 15 percent above their historical average, we would be in serious trouble. Obviously, if we do not get some big storms in the near future, the pumps are going to whine day and night on the farm. With that in mind, NOW is the time to get any maintenance done, to reduce the chance of in-season failure. You can get update your water and snowpack data base by going to my website: http://cekings.ucanr.edu/Agriculture/Grapes_Tree_Fruits_Nut_Crops/. Select “Management” in the main menu, then “Water and Weather”. Select “Snowpack Status” from the menu, which will link you to the state water resources webpage. This page converts snowpack into water content and plots it for three major sections of the state. It also compares this year to wet and dry seasons and the 30-year average. These plots really provide a visual picture of where we stand in water availability. Statewide reservoir conditions can be accessed by selecting “Reservoirs Status” from my webpage menu. This takes you to a DWR web site that lets you click on the reservoir of interest. It then brings up information about current and historic water status. The water in the major reservoirs clearly shows that most are above their historic average for now. Although this is somewhat comforting, we know how critical it is to have water stored as snow; hopefully any future storms will be big, cold ones.

With so little rain, every grower should still be out checking soil moisture with an auger to verify soil water content. I auger to five feet, and use the guidelines at: <http://cekings.ucanr.edu/files/19006.pdf>. to assess water content at one-foot increments with my fingers. 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. It is important to have some moisture in the soil to maintain the hydrologic cycle of the tree. Believe it or not, the tree is apparently moving water through its vascular system, and observations from the low chill winter of 2014-15 suggest that dry trees in the winter suffered greater delays in leaf out and bloom than those with good soil moisture.

Chilling Update: There is still hope, but as of this writing, it looks like 2018 could be a repeat of 2014-15 in terms of chilling. CIMIS stations in pistachio production areas statewide report low chill accumulation based on the Chill Portion model. As you know, we have migrated away from the traditional use of the below 45⁰F model, due to the occurrence of fogless, unusually warm days during past winters. The solar radiation associated with warm days raises the bud temperatures well above 45⁰ F, and thus they do not contribute to the

rest requirement of the tree. We often state that elevated temperature “negates” hours of chill accumulation, but we really do not know what that means. Some argue that you cannot take away what you have already made. Other researchers suggest that this negation may be more related to the consumption of limited soluble sugars within the bud and adjacent branches, whose concentration is critical to pushing the bud under favorable spring temperatures. I have written previously about the effect high January temperatures has on respiration; an increase of 10⁰ F can double the respiration rate, and rapidly deplete the stored carbohydrates. Regardless of the actual physiological mechanism, use of the Chill Portion Model considers these warm temperatures with the intent of providing a more accurate ESTIMATE of effective chilling. Also known as the Dynamic Model, it calculates chilling hours between 35-55⁰F in units known as “chill portions”. Dr. Ammon Erez and a team of researchers developed this more sophisticated model in the 1990’s to account for temperature variability, since it was common in their native country of Israel. Erez et. al, theorized that fluctuating warm temperatures inhibit physiological processes associated with satisfaction of deciduous tree rest. Rather than cancelling chill portions already created, Dr. Erez suggests that **warm weather prevents the creation of additional chill portions**. So, even if there WERE temperatures below 45⁰F for a given day, the existence of warm daytime temperatures negates their effect on rest development, and thus, a chill portion is not created.

Dr. Katherine Pope, Yolo County Farm Advisor, was funded by the pistachio industry several years ago to test the validity of the Chill Portion Model. Although the results were not as conclusive as she hoped, Dr. Pope’s data suggest that Kerman pistachios require about 58 chill portions to prevent yield reduction from inadequate rest. Peters blooms best at about 61 or greater chill portions. I have prepared Table 1 to contrast the Chill Portion accumulation this season, as of January 15, with that of previous years on the same date. The values in parentheses are the total number of Chill Portions accumulated from September 1 to February 15. As you can see, we are generally behind last year, and with another month remaining in our traditional chill accumulation period, we need to average one chill portion every day to have 50 by the end of January. From January 1 to the 20th, we have thus far averaged only half a chill portion daily. However, if one compares the statewide average chill portions for 2014, a poor chill year, and 2015, a good year, one learns that we received 15.2 additional chill portions from January 15 to February 15 in 2014, and 16.2 in 2015. So, the cold winter of 2015 had only **ONE** more chill portion accumulated during that period than the warm winter! Thus, the averages suggest that we could reach about 52 chill portions this year. If my napkin math proves accurate, we should expect delayed leaf out and some issues with bloom overlap between Kerman and Peters. We will just have to wait and see. Lots of great things can happen in between now and February 15.

Table 1. Chill portion accumulation for various CIMIS stations statewide from 9/1-1/15 for selected years. Numbers in parentheses are the total chill portions accumulated at each station by year from 9/1- 2/15. By RH Beede. 1/21/18.

Year	2017	2016	2015	2014	2013	2010
Durham	45	46(64)	51 (66)	42 (55)	40 (54)	58 (70)
Patterson	44	37(59)	44 (59)	48 (63)	44 (63)	56 (73)
Madera II	44	48(68)	49 (66)	37 (52)	41 (57)	(NA)
Parlier	36	39(56)	51 (67)	48 (64)	40 (53)	57 (74)
Five Points	37	40(56)	48 (65)	37 (52)	40 (55)	54 (69)
Coalinga	37	39(60)	49 (62)	33 (48)	41 (53)	56 (70)
Shafter	36	33(49)	47 (59)	47 (61)	46 (63)	52 (70)
Delano	missing	39(56)	48 (65)	40 (58)	42 (56)	55 (73)
Blackwell’s	38	42(60)	47 (67)	38 (52)	40 (50)	58 (75)
Arvin/Edison	34	39(54)	47 (61)	31 (44)	43 (55)	51 (66)
Porterville	39	26(49)	54 (76)	44 (63)	43 (59)	50 (63)

What About Using Oil This Year? Oil?? It’s your call! After oil took such a whipping in 2015, I have hesitated to suggest its use. I know what my years of research data showed; oil improved yield, and advanced bud break and harvest. However, the years in which I researched oil did not include these warm winters,

which effect rest satisfaction, and depletion in stored carbohydrates. These are critical to bloom and the grand period of growth. I did one project with Dave Demkey, former Tejon Ranch Nut Crop Manager, in a young pistachio orchard east of Highway 99, where he documented only 550 hours below 45⁰F. I tested 415 and 470 oils from Exxon, and experienced a one month enhancement in bud break over the untreated trees. We were unable to obtain yield data, unfortunately. Does this single test in a low chill site provide adequate support to suggest its use in other locations? NO! We do NOT know enough about the “threshold carbohydrates” needed in the bud and fruiting wood to know what to expect. There is obviously more research needed on manipulation of rest in pistachio, especially if warm winters become the norm! Also remember that oil is NOT registered as a rest breaking agent. It is registered on pistachio as a dormant treatment for scale control.

Scale management: Soft scale should be treated before the “rubber stage”, which usually occurs by the third week of February. Sevin XLR plus oil is very effective. 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 also effective alternatives to Sevin plus oil, and eliminates the rest breaking effect.

NOW management: I was going to lead off this month’s task list with this subject, but decided to cool my jets a bit. I remind readers that I do not get paid to prepare this task list; I do it as a service to the pistachio industry. I also do not get paid to be the NOW management drummer boy. My UC colleagues are understandably critical of my strong support for Mating Disruption, since they have not yet developed data to support its performance in pistachios. My question to you is; do you want to wait three years for the data on a concept that thus far, in all the other crops it has been implemented in, has been successful in reducing economic pest damage? Mating disruption is currently used for oriental fruit moth in shipping fruit, and codling moth control in apples, pears, and walnuts. Codling moths LOVE apples and pears. In non mating disrupted orchards, if you get five moths A WEEK you can have a potential disaster. Unlike NOW in nut crops, codling moth is attracted to pome fruits constantly, so their populations have to be kept very low. If you read about these crops on the UCIPM website, it states that mating disruption works best in large orchards, square in configuration. It also states that MATING DISRUPTION IS NOT A STAND ALONE PROGRAM! In these highly sensitive crops, properly selected and timed insecticide sprays are necessary to keep the codling moth populations below economic injury levels. The IPM website also states that SANITATION IS A MUST TO REDUCE THE OVERWINTERING INSECT POPULATION!

Now, I do not have the data to support the following statement, so **I offer it as my strong opinion;** community-wide implementation of mating disruption in pistachios is a very powerful tool, and in combination with winter sanitation and properly timed and executed insecticide sprays, is THE MOST POWERFUL NOW PROGRAM WE HAVE FOR LONG-TERM SUPPRESSION OF LEPIDOPTERA INSECTS. We have NO REASON to suggest that NOW, a Lepidopteran insect, will behave any differently than codling moth or oriental fruit moth. In fact, we have pistachio growers who HAVE IMPLEMENTED THE ABOVE PROGRAM, and report dramatic reductions in NOW damage at harvest in orchards with high pest pressure. If you are suffering excessive NOW damage in your pistachios, I believe you owe it to yourself to use all the tools available to suppress this insect, because the damage penalties from the processor are only going to get tougher, resulting in substantial loss of income. Why does this not make sense? Do you think this year is the one in which NOW is going to give you a pass? Do you want to wait until it is proven without a doubt that mating disruption is an effective NOW management tool in pistachios? As you contemplate your response, please remember one aspect of NOW that has changed dramatically over my career; the vast amount of nut crop acreage, especially almonds, provides a CONTINUM for sustaining NOW populations! As soon as NOW gets done infesting the almonds, they are coming after YOU when the almonds are harvested! You are messing with JAWS, and need a bigger boat! I will stand on stage and eat a pair of dirty underwear if properly employed mating disruption fails in pistachios! Thus far, growers who have implemented it as ONE ADDITIONAL TOOL, WITH PROPER MONITORING AND INSECTICIDE SUPPLEMENTATION, have reported less damage at harvest and increased income sufficient to pay for the additional cost.

ULTIMATELY, WE SEEK LONG-TERM SUPPRESSION OF NOW in the San Joaquin Valley! I believe sanitation, mating disruption, and professional insecticide treatments are the way to accomplish this!

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 Palm Desert!