HEALTHY FOOD SYSTEMS • HEALTHY ENVIRONMENTS • HEALTHY COMMUNITIES • HEALTHY CALIFORNIANS

University of California
Agriculture and Natural Resources
Making a Difference for California

UCCE

Tree & Vine

September 2011

Dealing with rain during almond harvest

David Doll, Pomology Farm Advisor, UCCE Merced County

A rain at harvest can be expensive - damage to the crop reduces the quality and premiums received from the huller, increase harvest costs reduce profit, and the use of forced air driers are costly. With rain imminent, it is important to keep in mind that practices should be employed to speed the drying of crop, whether it is in the tree or on the ground. The following guidelines may provide some help during a rain event during harvest.

- If rain is forecasted, do not shake trees as almonds will dry more quickly when hanging on the tree due to increased air circulation.
- If nuts are already on the ground, blow them away from trees but not into windrows or piles. Doing this will help prevent the nuts from sticking in the mud within the tree row strip. Once the nuts are stuck in the mud, it is difficult to move them away from the trees.
- Once the rain event has completed, rake the almonds frequently, turning them until they are thoroughly dry.
- If they are already windrowed, run them through a pickup machine and let the nuts fall out of the back. This will help turn the windrow nuts, increasing air contact, and will help remove wet debris from the pile.

A table developed by Larry Reinhart (North State Hulling Company) is provided below to serve as a further guide - especially if showers or high humidity persists.

	Prescribed action when 5-day forecast predicts			
Orchard conditions	Dry, windy, or normal weather	High humidity	Showers	Rain
No rain has occurred, and almonds are				
On tree	Knock	Knock	Knock	Wait
Knocked	Harvest normally	Harvest normally	Open*	Open
Opened and raked	Harvest normally	Harvest normally	When dry, windrow	When dry, windrow
Windrowed	Stockpile or pick up	Stockpile or pick up	Stockpile or pick up	Stockpile or pick up
After 0–1/4 in rain, almonds are				
On tree	Knock	Knock	Wait	Wait
Knocked	Harvest normally	When dry, open	When dry, open	Wait
Opened and raked	Harvest normally	When dry, windrow	When dry, windrow	1. Wait or windrow or 2. Pick up and machine-dry
Windrowed	When dry, pick up	When dry, pick up	1. When dry, pick up or 2. Pick up and machine-dry	1. When dry, pick up or 2. Pick up and machine-dry
After 1/4–1/2 in rain, almonds are				
On tree	Knock	Wait	Wait	Wait
Knocked	Harvest normally	Harvest normally, windrow	Harvest normally	Open
Open and raked	Harvest normally	Harvest normally, windrow	Harvest normally	1. Wait or windrow or 2. Pick up and machine-dry
Windrowed	Drop-chute†	1. Drop-chute or 2. Pick up and machine-dry	1. Drop-chute or 2. Pick up and machine-dry	1. Wait and drop-chute or 2. Pick up and machine-dry
After more than 1/2 in rain, almonds are				
On tree	Knock	Wait	Wait	Wait
Knocked	Open	Harvest normally	Harvest normally	Open
Opened and raked	Harvest normally	1. Pick up and move nuts to dry area or 2. Machine-dry	1. Pick up and move nuts to dry area or 2. Machine-dry	1. Pick up and move nuts to dry area or 2. Machine-dry
Windrowed	Drop-chute	1. Pick up and move nuts to dry area or 2. Machine-dry	1. Pick up and move nuts to dry area or 2. Machine-dry	1. Pick up and move nuts to dry area or 2. Machine-dry

Source: This table was originally developed by Larry Reinhart, former manager, North State Hulling Cooperative.
*To open, in this context, is to sweep almonds off berms but not gather them into windrows.
†To drop-chute is to run nuts through the pickup machine and drop them from an open cart. This process removes leaves and promotes quick drying by laying out a wide swath of almonds.

Information sourced from Chapter 35 of the Almond Production Manual:

Connell, J.H., G.S. Sibbett, J.M. Labavitch, and M.W. Freeman. 1996. Chapter 35: Preparing for Harvest. Almond Production Manual. University of California, Division of Agriculture and Natural Resources. Publication 3364. Oakland, CA.

The Importance of Post-Harvest Irrigation in Almond

David Doll, Pomology Farm Advisor, UCCE Merced County

Many have heard about the importance of irrigating almonds as soon as possible after harvest. This practice has been based off of previously conducted research and is recommended due to the detrimental effect that post-harvest water stress has on the following year's crop. Never-the-less, many growers do not recognize the importance of this practice.

An irrigation stress or deficit during the post-harvest period has been shown to reduce bloom, fruit set, fruit load, and individual fruit weight. For example, a University of California study conducted between 1989-1990 that deprived trees of post-harvest irrigation resulted in a 10% reduction in fruit set, a 33% reduction in fruit load, and a 43.3% decrease in kernel yields for the nonpareil variety*. It is thought that the sensitivity of the almond to the lack of post-harvest irrigation is most likely due to the late fruit bud differentiation which occurs from late August to early September.

As the first "round" of harvesting is completed, keep in mind the need to irrigate the trees. It is easily forgotten with the hustle and bustle of harvest, but the potential consequences of forgetting should turn the practice into a priority.

*Research paper cited: Goldhamer, D.A., Viveros, M. 2000. "Effects of preharvest irrigation cutoff durations and postharvest water deprivation on almond tree performance." Irrigation Science. Vol 19: 125-131.

Hull Sampling at Harvest to Determine Boron Deficiency

Roger Duncan, Pomology Farm Advisor, UCCE, Stanislaus County

Boron is one of the most common nutrient deficiency in Northern San Joaquin Valley almonds. While zinc and nitrogen are commonly applied to area orchards, boron is often neglected. If you haven't applied boron TO THE GROUND recently and your orchard is east of the San Joaquin River, you are most likely deficient. Boron is essential for pollen tube growth. There are no obvious foliar symptoms of moderate boron deficiency, but less than optimum boron can reduce nut set. Analysis of mature almond hulls is a much better indicator of boron status than a leaf analysis. Wait until harvest to collect hulls because they will continue to accumulate boron while splitting.

Trees with hull boron levels of less than 120 ppm may benefit from a postharvest boron spray (1-2 lb of a 21% B product in 100 gallons of water per acre). This will help with pollen germ tube growth in the flowers next spring but will not improve overall boron status of the tree. Hull boron of less than 80 ppm indicates the need for a ground application. Fertilize with the equivalent of 10 – 20 pounds of a 21% boron product per acre. Boron can be injected through micro-irrigation systems, broadcast or sprayed on the ground, or included in a herbicide spray. Herbicide sprays containing glyphosate may need to be buffered to prevent reduction of herbicidal activity. Hull levels over 200 ppm indicate excessive boron.

Interpreting a Water Analysis for Orchards or Vineyards

Maxwell Norton, UC Cooperative Extension

Summer and Fall are a good times to perform a water analysis. During summer, district water is under high demand and water tables are being drawn down. Summer is when the analysis is representative of when most water is used. It is not critical exactly when samples are taken. It is useful to take samples the same time each year so they are comparable. Conduct well water analysis every 2-3 years to determine any chemical problems that may be developing. Contact your irrigation district about what testing they do and whether any drainage water is pumped into the system upstream from where you draw out the water. You may want to do your own analysis.

Water quality problems will ultimately result in soil problems and symptoms in the crop. Tree and vine crops are usually more sensitive to the effects of salinity and toxic elements than most field crops and even some vegetable crops. Water high in calcium or with a high pH can reduce the effectiveness of pesticides and may need buffering or conditioning when mixing. Well water may also contribute significant amounts of nitrogen, and the fertilizer program must be adjusted accordingly.

The laboratory report will often include some interpretive information to assist you in reading it. You can also call the lab, ask your Pest Control Advisor, or a UC Farm Advisor for more explanation. Most UC ANR production manuals have a discussion on water quality and how to interpret the numbers.

pH This is the measure of how acidic or basic the water is. Ideally it should be near neutral (7.0) or slightly acidic (6.5 to 7.0). Within this range there will be no pH related problems with plants or with pesticide mixing. A slightly higher pH of 7.5 or even 8.0 is tolerable depending on the pH and chemistry of the soil.

EC An abbreviation for "electrical conductivity," is the main indicator of the salt content in the water. With orchards and vineyards values should be below 1.0 to avoid salt accumulation. Salts in the water can lead to salt accumulation in the root zone. Conversely, some irrigation district waters from the Sierra Nevada Mountains can have an EC so low that it can cause a permeability problem in some soils. Traditionally EC has been expressed as millimhos per centimeter (mmhos/cm). A more modern unit of measurement is deciSiemens / meter (dS/m). One mmhos/cm = one dS/m. A full discussion can be found in *Agricultural Salinity and Drainage* – ANR publication #3375, available at the **anrcatalog.ucdavis.edu** web site.

TDS Total dissolved salts is an alternative indicator of salt in the water. It is usually expressed as milligrams salt per liter (mg/L) or as parts per million (ppm). One mg/L = 1 PPM. A TDS of 640 mg/L approximately equals an EC of 1.0 dS/m more most waters.

B In some areas of the state boron can be high enough to cause toxicity in sensitive crops. In the Central Valley B toxicity is more commonly found on the west side of the Valley – especially along I-5. A value of <0.5 ppm suggests no risk, 0.5 to 3.0 suggests increasing risk, and severe toxicities can result from > 3.0 ppm.

Cl Chloride can be toxic to plants – especially fruit crops. A value of <140 ppm or < 4.0 meq/liter is desirable.

Na Sodium toxicity can develop if water has >70 ppm. Sodium, expressed as milliequivalents per liter is used in calculating the SAR.

Adj. SAR The Adjusted Sodium A**d**sorption Ratio is used to determine the potential sodium hazard of irrigation water. It is a function of the balance of sodium, calcium and magnesium in the water. SAR values >3 may cause problems over time with water infiltration and the accumulation of salt in the soil.

Bicarbonates & Carbonates Waters that are high in these can lead to plugging the drippers or micro jets and with deposits on leaves. Problems can develop with bicarbonate levels > 2 milli-equivalents/liter

N Nitrogen is usually present as nitrate (NO_3) in water. It can exist in high quantities in well water. Many labs will express it as nitrate-nitrogen. Ask the lab to also express the amount present, as pounds total N per acre-foot of water. That will make it easy to calculate how much N you are applying with each irrigation. Here are some handy conversions:
PPM nitrate x 0.61 = pounds nitrogen per acre-foot of water
PPM nitrogen x 2.72 = pounds nitrogen per acre-foot of water
PPM nitrate–nitrogen x 2.72 = pounds nitrogen per acre-foot of water
PPM nitrate x 0.226 = ppm nitrogen

More information: A good discussion can be found in Chapter 12 of Peaches, Plums & Nectarines - ANR publication # 3331; also in Chapters 5 & 26 of the Almond Production Manual - ANR publication # 3364; Chapter 15 of Raisin Production Manual – ANR publication #3393. Check your local Cooperative Extension office for availability. The almond manual may be out of print while waiting to be updated.

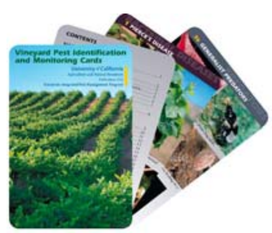
Vineyard Pest Identification and Monitoring Cards

Lucia Varela, Walter Bentley

Keep your vineyard healthy by staying on top of pest activity with this pack of 50 sturdy, pocket-size laminated cards. This is the perfect quick reference to identifying and monitoring vineyard diseases and pests.

Covers 27 common insects and mites, 8 diseases, 6 beneficial insects, and a variety of other disorders, weeds, and invertebrate pests. Each pest is identified by a description and excellent close-up color photographs -- 244 photos in all. On the reverse of each card is a description of the various life stages and monitoring tips.

Also includes descriptions of natural enemies and suggestions for least toxic management options as well as handy inch and metric measurement scales. A sturdy rivet keeps the set together so individual cards don't stray.



$25.00
ANR Publication # 3532

New Pest Management Guidelines for Pomegranates. Download for free from: http://ipm.ucdavis.edu/

"The Silent orchard aisles are sweet, with the smell of ripening fruit" – William Howells

Revised Free Publications

Pest Notes

Recently Updated:

Kikuyugrass