



UNIVERSITY OF CALIFORNIA ≈ COOPERATIVE EXTENSION  
SUTTER/YUBA COUNTIES,  
142A GARDEN HIGHWAY, YUBA CITY, CA 95991  
TEL: (530) 822-7515 ~ FAX: (530) 673-5368



# POMOLOGY NOTES

July, 2006 Newsletter – Almonds

## UPCOMING MEETING:

ALMOND BOARD ANNUAL CONFERENCE SET FOR DECEMBER 6-7, 2006 IN MODESTO. REGISTRATION BEGINS OCTOBER 15. FOR MORE INFORMATION CONTACT THE ALMOND BOARD OF CALIFORNIA AT (209) 549-8262.

## ALMOND ORCHARD PRACTICES TO CONSIDER IN JULY

### Nutrition:

- Take leaf samples to determine orchard nutrient status (see information below)
- Take hull sample at harvest for boron analysis (see information below).

### Irrigation:

- Reduced irrigation (60% of ET) can improve nut removal and reduce hull rot incidence during hull split timing.
- Recent research has shown that almond yield next year is very sensitive to water stress and early leaf drop this year. If possible (without getting irrigation water on nuts) irrigate orchard between harvests of different varieties. Some growers with micro-jet irrigation sweep prematurely-dropped nuts out of the way of irrigation water and irrigate.

### Pests:

- **Hull split spray:** Decide if a hull split spray is needed, using peach twig borer and navel orange worm trap catches and past grade sheets. If needed, spray when hull cracks first appear in the tops of the trees. Hull splits first appear in blank nuts, then in “good” nuts in dry orchards or water stressed trees.
- **Spider mites:** Monitor spider mites on a weekly basis. Mite populations can build up fast when weather is hot (now!), and late season defoliation can hurt next year’s crop.
- **Ants:** Be careful of ant damage on early harvest nuts. The longer nuts remain on the orchard floor, the higher the risk of ant damage. Bait (Clinch, Esteem, etc.) for ants, if needed, 4-7 weeks before harvest.

### Harvest:

- If harvest is late (due to weather, variety, etc.), know your options to protect crop from rain (see chart in this newsletter reproduced from Almond Production Manual, UC ANR Publication #3364).

## Almond Harvest Facts

- Almond nuts increase in weight until 100% hull split, but no size increase occurs after hull split.
- 100% hull split is reached when unsplit nuts in the shaded interior of the canopy can be split along the suture when squeezed from the tip and stem end.
- Nut removal should be at a maximum if 100% hull split has occurred. Nut removal will be more difficult if trees are especially vigorous.

- Almonds dry faster on the orchard floor than on the tree.
- Early almond harvest also avoids egg laying by navel orange worm adults.
- Some growers with no navel orangeworm problem (no eggs on their traps), delay harvest to minimize the time that nuts sit on the ground and are exposed to ants.

### **Time to Take Almond Leaf Samples**

July is the time to sample almond leaves for nutrient status of the orchard. This is a key practice that should be done every year. Here's how:

Take 100 fully expanded leaves from non-bearing spurs (spurs without nuts) at about 6 feet off the ground from the same variety, rootstock, and age. Ignore interplants. Avoid sampling leaves that are regularly "hit" by irrigation water, as irrigation water can leach some nutrients like potassium and leave salt deposits that can skew the analysis report.

**Note:** Micronutrients such as zinc, copper, iron, and manganese bind very tightly to leaf surfaces. If micro-nutrient foliar fertilization or pesticides with high micro-nutrient content (Manex, ziram, etc.) have been applied prior to leaf sampling, there is no need to pay for micronutrient analysis, because there is no way to separate micronutrients in leaves from the micronutrient spray residue on leaves.

How can maximum value at minimum cost be achieved from leaf analysis? If money is tight, reduce the number of nutrients requested for analysis, but don't abandon leaf sampling/nutrient analysis for the year. **Key nutrients for analysis in every sample, every year, in almonds are nitrogen, potassium, and zinc.** Hull boron sampling and analysis is important in almonds. Other nutrients may be important for specific blocks and should be included based on history and consultation with PCA or crop consultant.

### **CRITICAL NUTRIENT LEVELS FOR PRUNE AND ALMOND LEAVES\* SAMPLED IN JULY.**

NUTRIENT	ALMOND
Nitrogen	Below 2.0% = deficient 2.2-2.5% = adequate
Phosphorous	0.1-0.3% = adequate
Potassium	Under 1.0% = deficient Over 1.4% = adequate
Calcium	Over 2.0% = adequate
Magnesium	Over 0.25% = adequate
Sodium	Over 0.25% = excessive (potentially toxic)
Chloride	Over 0.3% = excessive (potentially toxic)
Boron	<b>Leaf data not accurate**</b>
Copper	Over 4 ppm = adequate
Manganese	Over 20 ppm = adequate
Zinc	Under 15 ppm deficient

\* Fully expanded leaves from non-bearing spurs sampled in July.

\*\* Use analysis results of hulls sampled at harvest to best assess almond boron status. See information below.

## CRITICAL BORON LEVELS FOR ALMOND HULLS SAMPLED AT HARVEST.

DEFICIENT	ADEQUATE	EXCESSIVE
30-80 ppm B	80-200 ppm B	Over 200 ppm B

How to sample almond hulls for boron analysis: Collect 10 hulls per tree from a number of trees at around 6 feet off the ground or pick from windrows. Where possible, keep hulls separate by variety. About a pint volume of hulls is the size of the final sample.

### New UC Publication on Fertigation

Fertilizer is getting more expensive. Fertigation, the practice of injecting fertilizer(s) with irrigation water, is an efficient way of delivering fertilizer. However, a recent UC study showed that injecting nitrogen fertilizer into the irrigation system at the wrong time may result in the expensive waste of up to 25% of the applied nitrogen!

To help growers avoid situations such as this, a new UC publication “**Fertigation with Microirrigation**” is now available. This manual guides users through strategies and decision making for fertigation with nitrogen, potassium, phosphorous, and gypsum. The guide also covers the characteristics of selected fertilizers commonly used for fertigation, long and short duration strategies, how to calculate injection rates, frequency considerations, how to apply fertilizers uniformly, mixing considerations, injection devices, and how to prevent backflow. Publication #21620. Cost is \$25.00. Orders can be placed by calling 1-800-994-8849.

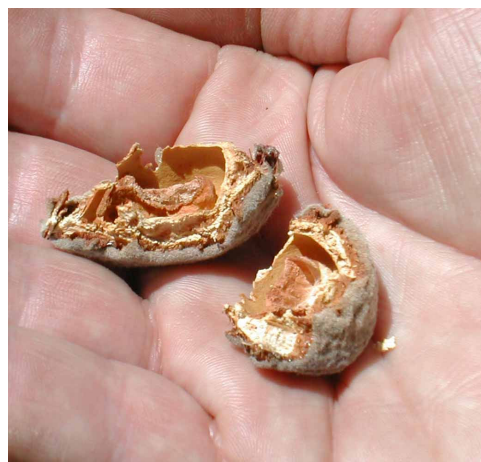
### Vertebrate Pest Damage: Who Dun It?

Two legged or four legged pests can cost growers money, literally eating the profits. The first step to fighting these pests is knowing what animal is doing the damage. Work at UC Davis some years ago generated valuable information on crow management in almonds. Their findings are available on-line at: <http://crowcontrol.engineering.ucdavis.edu/INDEX.HTM> through the efforts of Paul Gorenzel, one of the researchers. One of the things that they did was take photos of almond nut damage from squirrel vs. crow feeding. Here are two photos (available on the web site just listed) showing the difference between crow and rodent damage.

FIGURE 1. RODENT DAMAGE



FIGURE 2. CROW DAMAGE.



Here is what the website says about the differences between rodent and crow damage. “Rodent damage is characterized by a cleaner opening edge with the outer skin chewed back further than the shell opening, as shown on the left two shells.

Crow damage is characterized by shells opened lengthwise or endwise with a jagged edge from pecking, as shown on the right two shells. Rodents will usually open the nuts from the end but sometimes chew a hole in the side of the nut.”

Very valuable information on crows and crow behavior is available at the web site listed above. The site also contains information on the UCD bird repeller, an electronic device that produces amplified crow distress calls and designed for the California almond grower by UC Davis researchers. They have not yet found a manufacturer for the design, so it has not yet been commercially developed.

FRANZ NIEDERHOLZER  
U.C. FARM ADVISOR

## Protecting the almond harvest from rain.

Orchard conditions	Prescribed action when 5-day forecast predicts			
	Dry, windy, or normal weather	High Humidity	Showers	Rain
<b>No rain has occurred, and almonds are</b>				
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
<b>After 0-¼ in rain, almonds are</b>				
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
Windrowed	When dry, pick up	When dry, pick up	1. When dry, pick up or	2. Pick up and machine-dry
<b>After ¼ - ½ in rain, almonds are</b>				
On tree	Knock	Wait	Wait	Wait
Knocked	Harvest normally	Harvest normally, windrow	Harvest normally	Open
Opened and raked	Harvest normally	Harvest normally, windrow	Harvest normally	1. Wait or windrow or
Windrowed	Drop-Chute†	1. Drop-chute or	1. Drop-chute or	2. Pick up and machine-dry
<b>After more than ½ in rain, almonds are</b>				
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	1. Pick up and move nuts to dry area or	1. Wait or windrow or
Windrowed	Drop-Chute	2. Machine-dry	2. Machine-dry	2. Pick up and machine-dry
		1. Pick up and move nuts to dry area or	1. Pick up and move nuts to dry area or	1. Wait and drop-chute or
		2. Machine-dry	2. Machine-dry	2. Pick up and machine-dry
		1. Pick up and move nuts to dry area or	1. Pick up and move nuts to dry area or	Wait
		2. Machine-dry	2. Machine-dry	Open
				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.