



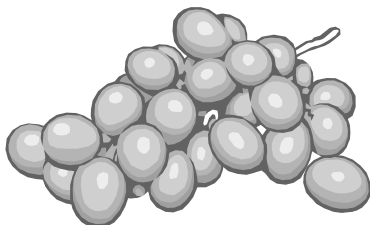
THE SCOOP

on fruits and nuts in Stanislaus County

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by Roger Duncan

Pomology and
Viticulture Advisor



To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.

Fall Nutrition for Almonds & Stonefruit

I am going to assume that all of you almond and stonefruit growers have taken your leaf samples in July and had them analyzed for nutrient content. (I know what happens when you ass-u-me things, but humor me on this). I will also assume that all almond growers have had their hulls analyzed for boron at harvest. Soil samples only need to be taken every few years, but plant tissue samples should be taken annually. By taking samples each year, fertility programs can be adjusted as needed.

Fall can be an excellent time to apply certain nutrients: specifically boron, zinc and potassium. Let's start with potassium; yield loss occurs in potassium deficient almond trees primarily because fruiting spurs die prematurely. In addition, new fruiting spurs are produced more slowly than in optimally fertilized trees. A local research trial has confirmed that almond yields will decline when potassium levels are less than about 1.4% in July-sampled leaves (1.2% for peaches). There are people who feel that potassium should be much higher than 1.4% (i.e. more than 2%), but we have never seen any evidence in our research trials or surveys to substantiate this. Potassium fertilizer is expensive, so applying potassium beyond what is necessary is a waste of money. However, I prefer to keep potassium levels a little higher than 1.4% for a few reasons:

1. If your leaf analysis shows 1.4% potassium this year, it is possible you may drop below that threshold by next year, which means you may be vulnerable to yield loss. This is particularly true if you're lucky enough to set a large crop in 2006.
2. A leaf analysis is an average of all sampled trees. This means if your analysis comes back at 1.4% potassium, some trees are higher than 1.4% and some are lower. By applying potassium to the whole orchard, you may waste some fertilizer on trees with adequate potassium levels, but you are protecting yourself from a few deficient trees bringing your average yield down.
3. Our study in Stanislaus County was done with Nonpareil. It is possible that some varieties (Price comes to mind) may benefit from slightly higher potassium levels.

In flood, solid set, or microsprinkler irrigated orchards, potassium can be banded on the soil surface in the fall. Sulfate of potash and muriate of potash (potassium chloride) are the most popular options. Potassium chloride is cheaper but should only be applied in orchards with excellent

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drainage. It should not be applied in orchards with high water tables or other impediments to deep leaching. Otherwise, chloride toxicity may result. Potassium fertilizers should be applied in a concentrated band, not broadcast. In drip-irrigated orchards, it is best to apply the potassium directly through the drip system unless you can lay the drip hose directly on the banded fertilizer.

Boron. I wish more growers would pay closer attention to this nutrient. This is by far the largest nutrient deficiency problem in the county. Many growers over-fertilize with nitrogen, spend hundreds of dollars on potassium fertilizer each year, and yet don't spend the few dollars to correct a boron deficiency problem. Hull samples are the most sensitive indicator of boron status. If your hulls have less than 80 ppm B, your trees are deficient and you are probably experiencing yield loss (trust me, if you are east of Highway 99 and have not applied boron, you are deficient). For the price of a burger and fries, you can correct boron deficiency and increase your yield. Apply 2 – 4 pounds of actual B (10–20 pounds of a 21% product) per acre to the soil. Do not apply boron in a concentrated band. Granular boron can be broadcast on the soil while soluble boron formulations can be injected into your micro-irrigation system. Some growers have successfully applied boron in their herbicide strips, but care must be taken not to affect the activity of certain herbicides. Soil boron applications will last 2-3 years, depending on soil type.

If your hulls have less than 120 ppm boron, you may increase your 2006 yield with a post-harvest boron foliar spray. Fall sprays do not have enough boron to correct overall boron deficiencies, but they do temporarily replenish a transient deficiency in the dormant fruit bud. Apply 2-3 pounds of a 21% boron product in 100 gallons of water while leaves are still active on the trees. If you miss the post-harvest period, you can also include boron in an early bloom (pink bud or popcorn) spray. Boron sprays at full bloom have been shown to reduce yield. Boron sprays after bloom are not very helpful.

Zinc. Zinc deficiency symptoms are most obvious in the spring. Zinc deficient trees often have delayed opening of flower and vegetative buds. Leaves are smaller, often have chlorotic areas between the veins and have a “wavy” leaf margin. Sometimes internodes are shortened. Later in the season, subsequent growth hides these symptoms, but nut size is reduced.

Zinc deficiency is most common in rapidly growing young trees or in areas with alkaline soils. Soil applications are expensive and inefficient. Zinc deficiency is best corrected with foliar sprays. Basic zinc sulfate (neutral zinc 52%) or zinc chelate can be applied safely at any time of the growing season at proper rates. This is the most efficient method of zinc fertilization because it can be “piggy-backed” with other planned sprays. Some growers apply a fall “leaf burn off” spray with 10 – 15 pounds of zinc sulfate in 50 – 100 gallons of water. This should be done at the beginning of normal leaf senescence (around the first of November). A word of caution – we have seen shoot and bud burn in peaches when zinc sulfate was applied in large amounts of water or when rains followed shortly after application. The excess water caused the zinc solution to accumulate to toxic levels at the lowest point on the shoot.

Fall Urea Sprays

It is certain that nitrogen plays a key role in bacterial canker management. A fall application of lo-biuret urea can supplement a grower's nitrogen program and should be a standard practice in orchards chronically affected with this disease. In our trials with replanted peaches, 100 pounds of lo-biuret urea at the beginning of leaf fall (around November 1) made the trees more resistant to bacterial canker. I do not know if we would have the same effect at lower rates. My guess is that lower rates would be less effective.

What about foliar urea on “healthy” orchards?

Studies have shown that foliar urea sprays can increase flowering, fruit set and yield of citrus. I conducted two trials to see if fall foliar urea might increase almond yields in “healthy” orchards. We applied 0, 25, 50 or 100 pounds of lo-biuret urea per acre in replicated trials in almond orchards in Patterson and Modesto. Both orchards have some ring nematodes but no bacterial canker. Past yields in these two orchards have been OK, but have not lived up to expectations. Neither orchard was nitrogen deficient according to leaf analyses. Yields for the urea treatments are listed below.

Rate of Lo-biuret Urea	Nonpareil Yield (lb per acre)	
	Patterson Orchard	Modesto Orchard
0 lb	1323	1140
25 lb	1405	1256
50 lb	1382	1194
100 lb	1356	1279

Observations from these trials:

- Yield increases from urea sprays were not statistically significant at $P \leq 0.05$
- There was certainly no yield benefit to applying more than 25 lb per acre
- We had shoot burn in the lower canopy in both locations at 100 lb per acre
- Trees sprayed with 100 lb urea flowered 1-2 days earlier than untreated trees

Other thoughts on lo-biuret urea: In a three-year trial conducted several years ago by former UC Soils Specialist Roland Meyer, fall sprays with ten pounds of lo-biuret urea resulted in yield increases of 274, 44 and 187 pounds per acre over unsprayed trees. However, just as in my two trials, these increases were never statistically significant. My feeling is that fall urea sprays may slightly increase yields in some cases, but don't expect miracles. If you have a bacterial canker problem, 100 lb urea will help with that. If canker is not an issue, fall urea sprays may help with yield a little, but there is probably no need to apply more than 10-25 pounds. Thanks to Joe Martini of Sun Flower Ranch and John Regusci for participation in these trials.

Glyphosate-Resistant Horseweed In California

Kurt Hembree; Farm Advisor, Fresno County
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The development of herbicide resistance by weeds is not a new phenomenon. It is a naturally occurring evolutionary process in response to a selection pressure, i.e. herbicides. There are currently 297 different herbicide-resistant weed biotypes globally, of which 27 biotypes are of *Conyza canadensis* (horseweed or mare's tail). The first case of herbicide-resistant horseweed occurred in Japan in 1980 to paraquat. Since then, horseweed has developed resistance to six different classes of herbicides, including the glycines (glyphosate – a Group 9 herbicide). Glyphosate is the active ingredient in Roundup®, Touchdown®, and dozens of other generic brand products registered in California. To date, all cases of glyphosate-resistant horseweed have occurred within the United States, with the first case documented in Delaware in 2000. By 2005, glyphosate-resistant horseweed has been found in 11 different states, including California (Northern Tulare County - July 2005).

In the case of California, resistance evolved due to the repeated use of glyphosate over a number of years along hundreds of miles of irrigation canal banks. Horseweed resistance to glyphosate evolved similarly in the other states where glyphosate products were repeatedly used in crop production areas. Glyphosate is a broad-spectrum herbicide that provides effective control of most weeds and is the most commonly used weed control product in the world. In order to maintain the effectiveness of glyphosate in California, it is imperative that growers, PCAs, and others prevent herbicide resistance and recognize when resistance is occurring and implement tactics to resolve it as soon as possible.

Indications of herbicide resistance include:

- A select number of plants showing significant re-growth following treatment at the recommended label dose and weed growth stage.
- A select number of plants completely escaping treatment, even though they were treated at the recommended label dose and time.
- Higher than label rates are needed for control.
- A shift in weed species occurring after years of treating with the same herbicide(s), even though they were controlled previously at the same recommended labeled rates.

Recommendations for herbicide resistance management:

- Make applications at the optimum time for control (correct weed growth stage and size) using the recommended label rate for the most difficult weeds in your field.
- Base your decisions on a field-by-field case and use a variety of effective tools available to obtain optimum weed control to minimize escapes.
- Avoid using tank-mixtures that reduce the effectiveness or optimum rates of the herbicide.
- Revisit the site 2 to 4 weeks after treatment and eliminate weeds escaping treatment.
- Avoid using the same herbicide or herbicides with the same mode of action year after year.
- Report any incidences of repeated non-performance to your local farm advisor, retail dealer, or chemical representative.

Refer to www.weedscience.org for additional information regarding herbicide resistance.

UPCOMING EVENTS:**Weed Science School
for Pest Control Professionals**

22 hours of CE credit offered
October 18-20, UC Davis
Contact: Pérez at (530) 752-1748
or register online at <http://wric.ucdavis.edu>

Shredder Demonstration Meeting

November 3, 2005
Contact: Kathy Kelley Anderson
at (209) 525-6800

Pistachio Shortcourse

This course is offered once every 5 years
November 8-10, Fresno
Contact: Karen Curley at (530) 754-8523

**2005 North San Joaquin Valley
Cling Peach Day**

December 13, Modesto
Contact: Roger Duncan at (209) 525-6800

***Wanted: 12' – 14' trailer for hauling a small tractor.
Contact Roger: 525-6800***