

Fall Nutrition for Almonds & Stonefruit

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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 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.