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The Berry Good News

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On the Horizon:

- **Weed control**
- **Post-harvest fertility program**
- **Drip irrigation line cleanout**
- **Scout for aphids, weevils, mites, and rust in rasp's**
- **Scout for leaf-rollers. aphids, weevils, tip (gall) midges, and viruses in blue's**
- **Apply Resist through drip or basal spray for root rot**
- **Leaf/Tissue samples**

(Please see your crop advisor for specific recommendations for your situation. No guarantee is written or implied in this newsletter. Always follow manufacturer's label.)

Post-Harvest Fertility

As this issue is being written, strawberry harvest is pretty-much over, raspberry harvest has already begun and blueberry harvest is about to begin, in Skagit and Whatcom counties. Having spent nearly a decade in California in farm management, I understand the intense nature of harvesting. Many of you will probably not have time to read this issue because of the focus on harvesting operations. Nevertheless, we present this issue dedicated to the subject of post-harvest fertility, hoping that you will read it once things slow down some. It is an important topic and one we think you will greatly benefit from reading.

Over the years I have had practical experience in treating various crops, including berries, with certain blends of liquid fertilizers after the crop comes off. What I have noticed is that if done correctly, a special blend of phosphorous, ammonium nitrogen, and potassium, can build up carbohydrate levels in the plant for storage for next year. This storage of nutrients means that the branches or canes will have more nutrients available to them when they break dormancy the following spring. It is a widely-held fact that most plants break dormancy before the roots awaken to start foraging for nutrients. Plus, most of the time when plants break dormancy, the soils are too cold for nutrient translocation.

I have listed below some of the advantages of using a post-harvest application of liquid fertilizers:

1. The plant is still growing and hasn't gone dormant.
2. It immediately replaces nutrients taken by the crop.
3. It builds a stronger plant for next year's crop.
4. It builds a stronger root system.
5. Liquid fertilizers are easier to apply, are more quickly absorbed, and are more plant responsive, preventing a delayed release in the late fall when plants are trying to go dormant.
6. It is a great way to get an early start to next year's fertility program.
7. It increases the chances for a better crop next season.

A lot of research has been done on tree and vine crops in California with post-harvest liquid fertilizers, and the results are overwhelming. Personally, I have spent over 7 years observing blueberry fertility programs that use post-harvest liquid fertilizers. In nearly all cases it has proven successful. Though little to no research has been done on raspberries, some of my own anti-dotal evidence suggests the same effect can be obtained as well. All we are really trying to do is store nutrients for conversion into carbohydrates for a better root system and fruit set next year. All fruiting crops do this to one degree or another.

For blueberries, I usually recommend a 5-10 gallon per acre application of Structure® 7-21-1-0.2Zn with 7% Organic Acids, unless the potassium levels are low, in which case I would recommend 15 gallons of Cache® 4-6-10. Cache® has been formulated as a cost effective and efficient source of potassium and phosphorus. This ratio of NPK when reacted with organic acids has proven to provide higher amounts of P and K in the plant when coming out of dormancy. Plus it has 2.5% Organic Acids which prevent phosphate from being tied up in the soil, and will buffer late-season salts and toxins that may end up in the soil from previous applications of fertilizers, herbicides, and irrigation water.

Regardless of whether I am using Structure® or Cache®, I always add 1 quart of Plant Plus to the mix, which is a highly-active plant and rooting stimulant. I started using Plant Plus about 2 years ago in blueberries, in the late summer, and noticed significant plant growth and fruit bud set compared to fields that were not treated with Plant Plus.

For raspberries, I usually recommend 15 gallons per acre of Cache® unless the potassium levels are excessive in ratio compared to Calcium, in which case I would recommend 10 gallons of Structure®. I always recommend adding Resist at this time for root rot control, at a rate of 1 gallon per acre.

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Focus on Fertility: Potassium (K)

Normally, we have devoted just a small paragraph to our "focus" on specific nutrients. However this issue we wish to dedicate a whole page to this particular nutrient: Potassium (K). The "K" is the atomic symbol on the periodic table of elements, and comes from the Latin *kalium*, which has its origin from the Arabic word *al-qalyah*, meaning "plant ashes". *Al-qalyah* is where we get the word "alkali".

The term "potash" when used in connection with fertilizers usually refers to potassium oxide. State and federal laws require that the potassium content be labeled in terms of potassium oxide, even though there may be no "potassium oxide" as such in the material. If you are applying a 0-0-50 fertilizer, 50% is the amount measured as potassium oxide, but you are actually getting only 41.5% actual elemental potassium.

Potassium is never found free in nature because it reacts violently with water. It is always bound in a mineral form. Potassium makes up about 1.5% of the earth's crust and is the seventh most abundant element.

Most soils are comparatively high in *total* potassium, usually containing more of the element than any of the other nutrients. However, the quantity of potassium held in an easily *available* form at any one time is relatively small. Anywhere from 90% to 98% of all soil potassium is unavailable. The rest is either slowly available (1-10%) or readily available (1-2%).

Picture of a potassium mine. Source unknown.

Readily available K is usually 90% exchangeable and 10% water soluble. Typically, exchangeable K is what most soil laboratories report. Potassium is gradually released or converted to more available forms through the action of solvents such as water, carbonic acid, and organic acids. Soils that are high in readily available K can actually have K fertilizers withheld and have the same amount of K released during a growing season by continual feeding of organic acids.

Soluble K is positively charged and is held onto the negatively charged clay colloids. Conventional agronomy has heavily emphasized the use of potash, resulting in many cases with the overloading of the clay colloids and the displacement of calcium. Potassium does not have the same electro-chemical properties as calcium and does not provide the same support to the clay structure. The excessive potassium can result in structural collapse of the soil which can effect the fertility and increase compaction. Conversely, Sandy soils can present a challenge in maintaining K levels, because they don't have much clay content, therefore they don't hold K well. However, even in sandy soils it is important not to be displacing calcium. Most growers who regularly apply potassium should also regularly apply calcium and magnesium.

In the plant, the basic function of potassium is to determine the caliber and thickness of the stalk and leaves, fruit size, and number of fruit that sets. Used in excess, potassium will replace calcium in the cell structure, resulting in a diseases cell. Conventional agronomy has become addicted to nitrogen and potash. Like any drug addiction, the requirement for the drug increases over time. Farmers are told that in order to increase yield, add more nitrogen and potash. As the soil degenerates, it requires more of this "drug" just to sustain the crop yield. I have spoken with numerous farmers who have said that their yields seem to keep dropping so they keep putting more and more fertilizer down, all the while the problem seems to get worse. The problem is one of balance. Potassium does have its place in crop nutrition, in fact a very important one, but it must be in balance with all the other elements.

Sources: Fertilizers and Soil Amendments (1981); Wikipedia online dictionary; The Non-Toxic Farming Handbook (1998)