AVOCADO MINERAL NUTRITION. THE WATER-NUTRIENTS RELATIONSHIP A-123

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It has been well established that irrigation practices and mineral nutrition have a significant effect on the avocado tree growth, production and fruit quality. With the introduction of modern pressurized irrigation systems, which incorporates fertilizers into the irrigation system (Fertigation), water and nutrients should be looked as inter-related factors.

Till now, the most common way to understand the effect of water on the avocado nutrition is by the leaf mineral analysis. Correct leaf sampling is a crucial factor for the accurate nutrition assessment. Only spring flush leaves should be sampled in the autumn. The best criterion for correct sampling is the calcium level. In autumn sampling, Ca level in the spring flush leaves should be in the range of 1.7%-2.2%.

The water effect on the avocado nutrition can be summarized as follows:

The rainy season is followed by increase in N,P,K and decrease in Ca and Mg (Martinique) and heavy rainfall results in decrease in Cl level (Israel).

Irrigation method but slightly affects avocado nutrient levels. Drip irrigation increases Cl and Mn concentrations as compared to flood irrigation in Texas and Cl level as compared to microjets in Israel. One of the effects of dripping on avocado nutrition is via its effect on soil aeration .There are many instances where conversion of chlorotic avocado orchards from flood or sprinkler to drip reduced iron induced chlorosis. There is some effect of irrigation interval as frequent irrigations increase iron induced chlorosis and Cl levels in the leaves.

Water amount is the best way, except fertilization itself, to control avocado nutrition. Increased water amount increase Na, Cl and B probably due to the increased quantities of these elements applied with the water. On the other hand applying more water reduce N,P,Ca,Mg,Fe and Zn levels in the leaves, largely a dilution effect resulting from increased growth or leaching. Controlling water amount is essential to reduce leaching and pollution of underground water.

In parallel to the world water shortage, the use of saline water for avocado irrigation is increasing from year to year. Salinity increases not only Cl and Na concentrations in the leaves but also K,Zn, and Cu and decrease N,Mn, and possibly P and Mg. Another possible future source for avocado irrigation may be reclaimed wastewater which contain high levels of salts and nutrients. The use of reclaimed wastewater result in increased levels of Cl, Na and B. In that aspect, leaf analysis serves as a monitoring tool (in preventing excess of toxic elements) rather than nutrition assessment. Water analysis before and during the irrigation season and adjustment of fertilizers accordingly, might reduce the growers expenses.