CITRUS LEAF ANALYSIS

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Citrus leaf analysis should be done when nutrient levels in leaf tissues are stable, from ***mid-August through early October***. University of California researchers have established critical ranges for specific nutrients in that period. Leaf analysis may indicate specific deficiencies or problems that are just beginning to develop. These can then be used to modify your fertilizer program.

Collecting Samples

To sample leaf tissue, collect leaves from the spring growth flush (4 to 7 months old) from non-fruiting branches. Each set of samples should represent a block of a single variety and rootstock and be similar aged trees growing in similar conditions.

Walk diagonally through the orchard block, randomly picking leaves, one leaf from each sample tree. Pick average-sized, undamaged leaves from normal, healthy trees. Be sure that the sample includes leaves picked from each side (N-S-E-W) of the trees. Generally, each sample should include a minimum of 50 leaves, but check with your lab for specific instructions.

If one area of the orchard is less vigorous than others, sample it separately and compare the results to those from healthier areas. Follow the same sampling procedure, choosing normal-looking or slightly affected leaves, do not pick the worst leaves. Severely affected leaves may give a false picture of nutrient status as the tree may have moved nutrients out of them.

Place the leaves in a paper bag, and hold in a cooler or refrigerator until they are sent to the lab. Send samples to the lab as soon as possible so that the results are accurate. It is best to use a lab that washes the leaves as part of the analysis.

What to Analyze

The first time you do a leaf analysis, sample all of the elements. Once you have a baseline, check only the elements where a problem is suspected. The most common deficiencies in the foothills are nitrogen, zinc, and manganese. Boron, potassium, and phosphorus are sometimes deficient. Leaf analysis is a helpful guide in orchard nutrition, but monitoring is critical. Careful observation is needed to detect changes in tree appearance, growth rate or fruit production. Be sure that a nutrient deficiency is really the problem before applying a fertilizer.

Critical Nutrient Levels for Citrus (oranges):

	Deficient Below	Optimum	Excess
Nitrogen (N)	**2.2%**	**2.4 - 2.6%**	**>2.8%**
Phosphorus (P)	**0.09%**	**0.12 - 0.16%**	**>0.30%**
Potassium (K)	**0.40%**	**0.70 - 1.09%**	**>2.30%**
Zinc (Zn)	**16 ppm**	**25 -100 ppm**	**>300 ppm**
Manganese (Mn)	**16 ppm**	**25 - 200 ppm**	**>1000 ppm**
Boron (B)	**21 ppm**	**31-100 ppm**	**>260 ppm**

n.b. mandarins levels may be slightly different, but close to this range.
From *Soil and Plant-Tissue Testing in California*. 1978. UC ANR.

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References

Citrus Health Management. 1999. L.W. Timmer and L.Duncan, editors. American Phytopathological Society.

Citrus Nutrition Management. 2001. Joseph H. Connell. Presented at 2001 Orland Citrus Research Seminar.

Guide to Common Nutrient Deficiency and Herbicide Injury Symptoms in Citrus. G.C. Wright and W.B. McCloskey. University of Arizona. Available at http://ag.arizona.edu/pubs/crops/az1007/az1007-1.html

Integrated Pest Management for Citrus, second edition. 1991. UC Statewide IPM Project. UC ANR Publication # 3303.

Macronutrient Deficiencies in Citrus. 2003. M. Zekri and T.A. Obreza. Florida Cooperative Extension Service. SL 201. http://edis.ifas.ufl.edu/pdffiles/SS/SS42000.pdf

Micronutrient Deficiencies of Citrus. 1981. Robert G. Platt. UC ANR Publication 2115.

Soil and Plant-Tissue Testing in California. 1978. H.M. Reisenauer, editor. University of California Bulletin 1879.

Successful Use of Foliar Applications of Essential Mineral Nutrient Elements to Increase Fruit Set and Yield of Citrus and Avocado. *Subtropical Fruit News, vol 6, no. 1.* 1998. Carol J. Lovatt.

Area labs that do tissue testing:

Timberleaf Labs
39648 Old Spring Rd.
Murrieta, CA 92563
951.677.7510
http://www.timberleafsoiltesting.com

Fruit Growers' Lab
563 E. Lindo
Chico CA 95926
Phone: 530.343.5818
530.343.3807 fax
http://www.fglinc.com/

A & L Western Ag Labs, Inc.
1311 Woodland Ave., Suite 1
Modesto, CA 95351
Phone: (209) 529-4080
209.529.4736 fax
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Sunland Lab
11353 Pyrites Way. #4
Rancho Cordova, CA 95760
Phone: 916.852.8557
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