# CITRUS LEAF ANALYSIS

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Citrus leaf analysis is an accurate way to determine the nutrient status of your trees. It is valuable for assessing nitrogen (N) and potassium (K) levels, as they move fairly easily in water, so soil tests may not give an accurate picture. It is also effective for evaluating manganese (Mn), zinc (Zn), and iron (Fe) which are common deficiencies in the foothills. Tissue testing for these nutrients is a better indicator of the effectiveness of your fertilizer program than is soil testing.

Citrus leaf analysis should be done when nutrient levels in leaf tissues are stable, from ***mid-August through early October*** for mandarins in the foothills. 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

**Critical Nutrient Levels for Orange**

| | 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** |

Mandarin 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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nutrients. Once you have a baseline, you can check the efficacy of your fertilizer program by annual testing. Once you have a stable fertilizer program and several years of testing, you may only need to evaluate potential problem areas on an annual basis.

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.

**References**


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