



Leaf Analysis of Tree Fruits

by Tara A. Baugher, Extension Specialist—Horticulture
and Suman Singha, Associate Professor—Horticulture

AN IMPORTANT TOOL FOR DETERMINING NUTRIENT NEEDS

Chemical analysis of plant foliage is an important tool for establishing and maintaining a proper fertilizer program in fruit plantings. Leaf analysis can be used to confirm or diagnose a problem associated with a nutrient shortage or excess, and more importantly to prevent the development of a nutrient disorder in an orchard. Usually, it reveals that certain fertilizers being used are not necessary and results in the most economical fertilizer program.

For diagnosing a problem, only a single analysis properly taken may be needed. In other instances, a series of analyses may be necessary to arrive at a proper explanation. Paired comparisons, one from normal and one from the abnormal condition, are frequently helpful.

Foliar analyses made over a period of years can indicate an approaching deficiency of a nutrient element before the plant shows any visible symptoms. It is possible then, through proper corrective fertilizer applications, to prevent the deficiency from ever occurring in the tree. By the same token, it is possible to learn when an element may be increasing in a tree toward a level that will reduce fruit quality or bring about some other undesirable effect. When this condition is known, steps can be taken to alter the fertilizer program and cultural practices that influence the uptake of the element from the soil.

Grower use of leaf analysis should be aimed at reaching optimum production within the limits of good nutrition. Other factors such as diseases, soil moisture, and insects become the limiting factors once desired nutritional levels are reached and maintained. Using leaf analyses only when nutritional problems are suspected will not yield the greatest grower returns.

COMMON NUTRITIONAL PROBLEMS IN WEST VIRGINIA ORCHARDS

Nitrogen control is the most common and serious nutritional problem in West Virginia orchards. Excessive levels of nitrogen occur more frequently than deficient levels. Deficiencies of potassium, magnesium, calcium and boron have been found in some orchards in the state. Manganese toxicity (expressed as Internal Bark Necrosis on apple trees) is also found in some locations. Although not widespread, these nutrient imbalances do cause problems in isolated blocks of trees.

All of these disorders can be most readily identified by leaf analysis. In many cases, growers have found that money spent for leaf analysis has been returned many times over in reduced fertilizer costs and in better crops of higher quality fruit.

FURTHER INFORMATION ON LEAF ANALYSIS

Contact Extension Specialist—Horticulture, West Virginia University Experiment Farm, P.O. Box 303, Kearneysville, West Virginia 25430 (phone 304-876-6353) to obtain leaf sampling kits for tree fruits. The proper time to take apple and peach leaf samples is between mid-July and mid-August.



Figure 1. In mid-July to mid-August leaf samples are taken from fruit trees midway on the current season's growth.



Figure 2. Atomic absorption is a relatively new analytical technique that facilitates the determination of plant nutrients and makes leaf analysis more useful because of the broader and more accurate analysis.