INTERPRETATION OF LEAF ANALYSIS RESULTS FOR NORTHERN MICHIGAN

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Leaf analysis is a very good way to determine the general nutrient condition of established orchards. However, you should try to put some of your own interpretation into the results, since you are the most familiar with each orchard location. It is also very advisable to take a soil sample about once every three years to keep abreast of changes in soil pH. Many nutrient deficiencies and excesses are induced by excessively low or high pH. Take soil samples from the tree rows, not the sod middles. Knowing the soil pH is important to best interpret leaf analysis results.

Included with the results are suggested guidelines developed by Eric Hanson and Jim Nugent for determining fertilizer applications based on leaf analysis. These figures should help you to see where each nutrient element should be in the leaves to be in the desired range.

A few nutrients require some special comments:

Potassium: Levels will generally be lower in years when trees are experiencing drought stress. Whenever levels are below the desired range, apply 200-300 lbs/A of 0-0-60 or equivalent Because of our generally sandy soils in NW Michigan, I suggest when levels are in the lower 1/3 to ½ of the desired range that orchards should receive a maintenance potash application of approximately 100 lbs/A of 0-0-60 or equivalent. If the maintenance level is not applied, then expect to need to apply a higher rate for the following year.

Boron: Work by Dr. Eric Hanson, MSU, and Dr. Warren Stiles, Cornell University, has indicated best productivity when boron on cherries and apples is 25-50 ppm in the leaves. However, recent research indicates that excessive boron may increase problems with soft tart cherries. If a tart block is experiencing significant soft cherry problems, then I suggest not applying additional boron unless boron is below 15 ppm. If boron is needed on tart cherry, apply either: 1) 5 lbs of Solubor per acre applied post-harvest or 2) a broadcast soil application of 2 pounds of actual boron per acre. Other sources of boron may be substituted for Solubor. Do not apply excess boron because it can be toxic and do not apply between bloom and harvest on cherries. Apples often respond well to B applied at pink. High concentrate and/or late season application on apples increases risk of injury to foliage and fruit. Boron in spray water will cause water-soluble packages to turn into a slimy mess that will plug nozzles. Allow water soluble packages to dissolve before adding boron. B uptake is greatly reduced under drought conditions.

Zinc: If zinc is below 10 ppm, make two foliar applications of 2 to 2 1/2 pts per acre of 9% liquid zinc chelate (or equivalent if percentage differs) in cover sprays. If between 10-15 ppm, one application in a cover spray should be adequate. If using zinc sulfate instead of zinc chelate, then you must add spray lime as a safener at rates equal to the zinc sulfate rate and beware of compatibility problems with other sprays.

Magnesium: If results indicate low magnesium, have soil tested to determine pH prior to liming. If pH turns out to be high due to high calcium, then add magnesium from some source other than dolomitic lime. The most common sources of magnesium, other than dolomitic lime, are Sul-Po-Mag for soil application and epsom salts for foliar application. If using epsom salts, apply approximately 10 lbs per 100 gal dilute, or 15 to 20 lbs per acre concentrate, in the first 2 or 3 cover sprays. Sul-Po-Mag (25% K_2O and 25% Mg) as a soil application is a good choice when both potassium and magnesium are needed, but pH is high. If lime is needed to correct low pH, use the recommended rate of dolomitic lime, but don't exceed 3 tons/acre/year if applied on established sod.

Manganese & Aluminum: Very high manganese and/or aluminum levels will often occur with low pH. This occurs because Mn and Al are much more available to plants when the pH is low. Excess Mn can cause measles in apples while excess Al leads to tree decline in sweets. The high levels of both will disappear when lime is added and the pH is raised.

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