

Fruit Crop Tissue Analysis

John Strang and Shawn Wright, Extension Horticulture Specialists

A critical requirement for producing an excellent fruit crop is knowing the nutritional status of your planting. The only way that the nutritional status can be assessed is through foliar analysis. Soil tests provide only a portion of the picture and tell what is in the soil. Tissue analysis shows which nutrients the plant is actually absorbing and facilitates fine tuning of the fertilization program. It lets the grower know when an element is becoming deficient before symptoms show up and allows for correction of the problem before fruit quality and yield suffer. It is not necessary to sample a block every season, because nutrient levels do not change that rapidly. It is generally recommended that a block be sampled once every three years.

Since the University of Kentucky does not have a facility for conducting plant analysis for growers, we recommend that you send your plant samples to a lab that will process your samples and provide results that are consistent with our recommended sampling periods as described in our Midwest Tree Fruit Pest Management Handbook and the Midwest Small Fruit Pest Management Handbook. Both of these publications are available on the web at <http://www.uky.edu/Ag/Horticulture> under Commercial Horticulture and Fruit.

The following labs have tissue analysis programs that work well with our midwest tissue analysis sampling periods. Growers should call the labs to purchase pre-paid kits, available from several of the labs and to obtain specific directions from the particular lab as well as an update on analysis cost. Most of these analyses

include the standard 10 elements, nitrogen, phosphorus, potassium, calcium, magnesium, manganese, iron, copper, boron, and zinc.

A & L Analytical Labs, Inc. (Cost: \$26.00)
 2790 Whitten Road
 Memphis, TN 38133
 Phone: (800) 264-4522 or (901) 213-2400
<http://www.allabs.com>

Cornell Nutrient Analysis Lab (Cost: \$30.00)
 G01 Bradfield Hall
 Cornell University
 Ithaca, NY 14853
 Phone: (607) 255-4540
<http://cna1.cals.cornell.edu>

Penn State University (Cost: \$24.00)
 Agricultural Analytical Services Laboratory
 The Pennsylvania State University, Tower Rd.
 University Park, PA 16802
 Phone: (814) 863-0841
<http://www.aasl.psu.edu/plants.html>

Waters Agricultural Laboratory (Cost: \$15.00)
 2101 Calhoun Rd., Hwy 81
 Owensboro, KY 42301
 Phone: (270) 685-4039
<http://www.watersag.com>

The time of sampling is extremely important to obtain a correct analysis. Table 1. summarizes the sampling procedure and timing for most of our major fruit crops. These sampling periods correspond to the time for which we have nutrient level standards and are periods where the levels are somewhat stable in the plant.

Table 1. Fruit crop plant tissue sampling periods and crop specifications

CROP	SAMPLING DATE	LEAF NUMBER	PART SAMPLED
STRAWBERRY <u>Plasticulture</u> New Planting	Mar. 15- Apr. 15	60	Youngest fully expanded mature leaves immediately after removing row cover.
Planting carried over second season	September or Mar. 15 - Apr. 15	60	Youngest fully-expanded mature leaves.
<u>Matted row</u> Renewed planting	July 15 – Aug. 15	60	Second spring - same as above. First fully expanded leaves after renovation.
BLUEBERRY	June 15 – Aug. 15	80-100	Sample leaves during first week of harvest.
GRAPE	July 1 – Aug. 15	60-80	Select only the first fully expanded leaves on fruiting shoots located halfway between the ground and highest trellis wire. Detach petioles from leaf blades and send in only the petioles.
APPLE, PEACH, NECTARINE, PEAR, PLUM	July 15-August 15	60-70	Select shoots that make a vertical angle of 45 to 60 degrees from the ground. Select shoots at eye level from around the outside of trees. Remove one or two leaves from the mid-portion of new growth. No more than 10 trees should be used for each sample.
BLACKBERRY & RASPBERRY	Aug. 1-20	60	Sample from non-fruiting canes (primocanes) selecting younger, fully expanded leaves.

In sampling, select only healthy leaves from healthy plants. Collect leaves at random throughout a block from one cultivar and one rootstock on a similar soil type. Leaves from young (nonbearing) and old (bearing) cultivars should not be mixed, since the nutritional needs of young and older plants are different.

Dust or pesticides on the leaves will affect the analysis, particularly for zinc, manganese and iron. Select clean leaves or the leaves may be washed. Dirty leaves should be washed very quickly in water with a small amount of liquid dishwashing soap and then rapidly rinsed through two containers of water. Leaves should then be air dried on a paper towel and sent to the tissue analysis lab.

Proper interpretation of the tissue analysis requires that a soil sample be taken at the same time or there should be a recent

analysis from the block where the tissue sample was taken. The laboratory will send the results of the tissue analysis directly to the grower with recommendations. **Kentucky growers should request that the lab send a copy of the analysis to John Strang for additional interpretation using their soil sample results.** Please include the following address on the foliar analysis form.

John Strang
Dept. of Horticulture
N-318 Ag. Science Bldg. North
Univ. of Kentucky
Lexington, KY 40546
(859) 257-5685
e-mail: jstrang@uky.edu