

ARKANSAS FOLIAR ANALYSIS PROGRAM FOR FRUIT GROWERS

Sampling Procedure Fact Sheet

Please read all instructions carefully.

Leaf samples are to be collected by the grower who may request help from his county agent's office. It is important to follow a standard sampling procedure since leaves vary in nutrient content depending on the location they are collected on a tree, bush, or vine.

The following are simple instructions on the sampling procedures which must be followed exactly if a representative sample is to be collected.

Soil samples can also be collected by the grower and they should be taken about the same time as leaf collection.

Tissue Sample

Timing

Collect leaf samples between **July 15 and July 30 for all crops except grapes** which should be collected when berry color or ripening (veraison) is beginning and **plasticulture strawberries**. See **Table 1 for specific fruit crop or FSA6130 (fruits) FSA6131 (pecans)**.

Selection of trees, bushes, or vines

1. Only one variety should be included in any one sample. Also, if trees or vines of the same variety are grafted on different rootstocks these areas should be sampled separately and submitted as individual samples.
2. Use 6 to 10 trees for each sample for tree fruits, 30 to 50 bushes for blueberries, and 20 to 30 vines for grapes.
3. The selected plants should be representative of either:
 - a. the average of the variety in the planting
 - b. the average of a problem area
4. A single sample should not represent an area of more than 10 acres for tree fruits, 3 acres for blueberries, and 5 acres for grapes.
5. (Optional) Tag your sampled plants for future identification and possible resampling in future years.

NOTE: Inspect selected plants before sampling for mechanical injury, mouse damage, winter injury, or wet feet as these factors could influence nutrient level without showing the true nutritional condition of the plant.

Selection of Leaves

1. Select all leaves from the middle of the current season's terminal growth; except on grapevines. For grapevines select leaves that are recently matured (usually 5 to 7 nodes from the tip).
2. Do not collect more than 2 leaves from one shoot on tree fruits, 4 leaves from one blueberry bush, or 4 leaves from one grapevine.
3. For tree fruits use shoots that you can reach from the ground and located on all sides of the tree.
4. Collect up to 10 to 12 leaves per tree for tree fruits, 2 to 4 leaves per bush for blueberries, or 2 to 4 leaves per vine for grapes.
5. The total sample should be 60 to 80 leaves.
6. Remove leaves with a downward pull so the leaf remains attached to the leaf blade.
7. For grape samples, the leaf blade should be removed and discarded and the leaf stem or petiole retained for analysis. This removal should be done at sampling.

NOTE: Avoid spur leaves or leaves which are dusty, diseased, or mechanically damaged.

Handling

1. Place leaves or petioles in the perforated paper bag for drying.
2. Do not expose sampled leaves or petioles to direct sun or allow them to heat in the bag while drying.
3. Dry leaves or petioles in a good crisp condition with the bags open; however, provide a condition so that dust will not collect in the bags during drying.
4. Place dried leaf tissue into a closed bag for shipping.

Identification

Each sample bag should have the following identification:

- | | |
|----------------------------|----------------|
| 1. Your name | 3. Variety |
| 2. Your address and county | 4. Sample date |

Questionnaire

Fill out questionnaire as accurately and in as detailed a manner as you can. Information on the questionnaire is vital to the interpretation of the foliar analysis data.

Each tissue sample must be accompanied by a questionnaire sheet having a similar identification.. If more than one sample of a variety is taken, identify the sample with a number or letter, i.e., Golden Del. "A" and Golden Del. "B".

Table 1. Foliar Sampling Procedures for Fruit Crops		
Crop	Sampling Procedure	When to Sample
Apple	Select 60 to 100 leaves per sample from the middle of current season terminal shoots. Select 1 or 2 leaves per shoot from several shoots on each of several trees exposed to light. Shoots to be sampled should be 5 to 7 feet above ground level in larger-sized trees and 3 to 6 feet above ground level in smaller sized trees (young trees, trellised or slender spindle plantings). Sample 5 to 10 trees per acre.	Eight to 10 weeks after full bloom
Blackberry	Collect 50 to 100 mature leaves from primocanes in the section six to ten nodes from the terminal.	Mid to late July
Blueberry	Take 50 to 100 mature leaves from mid-portion of fruiting cane from across the field.	Collect leaves during the first two weeks after harvest.
Grape: Table, wine, juice)	Collect 100 petioles from the most recent mature leaves next to fruit clusters.	Collect petioles in mid to late summer before version (when the fruit begins to change color).
Grape: Muscadine	Collect 50 to 100 leaves from the most recent mature leaves next to fruit clusters.	Collect leaves mid to late summer before final swell of the fruit
Peach	Collect 50 to 100 mature leaves from the mid-portion or near the base of the current season's terminal growth. Sample 5 to 10 trees per acre.	Mid- season
Pear	Select 60 to 100 leaves from the middle of current season terminal shoots. Select 1 or 2 leaves per shoot from several shoots on each of several trees exposed to light.	Eight to 10 weeks after full bloom
Pecan	Sample the middle pair of leaflets from the mid-portion of terminal growth 56 to 84 days after catkin fall.	Early July to early August
Strawberry	See your County Extension Agent for specific instructions for strawberry petiole analysis.	

SEND DRIED LEAF SAMPLES TO: University of Arkansas
 Agricultural Service Lab
 1366 W. Altheimer Drive
 University of Arkansas
 Fayetteville, AR 72704

MAKE CHECKS PAYABLE TO: University of Arkansas Agricultural
 Diagnostic Service Laboratory
 (Send in separate envelope to above address) **(\$18.00 per sample)**

Interpreting your results. Table 2 gives you the sufficiency ranges for the macro and micro nutrients. If you need help interpreting your results or want fertilizer recommendations please contact your county Extension agent or me at:

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Table 2. Macro and micro nutrient sufficiency ranges for fruit crops									
	Apple	Blackberry	Blueberry		Grape		Peach	Pear	Pecan
			Highbush	Rabbit-eye	Wine, Table	Muscadine			
Macronutrients (%)									
N	1.80-2.10	2.00-3.00	1.70-2.10	1.20-1.70	0.66-1.10	1.65-2.15	2.75-3.50	1.80-2.50	2.50-3.30
P	0.15-0.50	0.25-0.40	0.10-0.4	0.08-0.20	0.11-0.35	0.12-0.18	0.12-0.30	0.12-0.30	0.12-0.30
K	1.25-1.80	1.50-2.50	0.40-0.65	0.35-0.60	1.00-3.00	0.80-1.20	1.30-3.20	1.00-2.00	0.75-2.50
Ca	1.00-2.00	0.60-2.50	0.30-0.8	0.25-0.70	1.26-3.00	0.70-1.10	1.50-2.50	1.00-2.00	0.70-1.75
Mg	0.20-0.50	0.30-0.90	0.15-0.3	0.14-0.20	0.46-1.25	0.15-0.25	0.25-0.50	0.25-0.50	0.30-0.60
S	NA	NA	0.12-0.20	0.11-0.25	0.13-0.35	0.15-0.60	0.12-0.40	0.10-0.30	0.20-0.50
Micronutrients (ppm)									
Fe	50-400	50-200	60-200	25-70	31-100	60-120	>60	30-150	50-300
Mn	25-200	50-200	50-350	25-100	61-650	60-150	>20	20-200	100-800
Zn	20-50	20-50	8-30	10-25	41-100	18-35	20-50	20-50	50-100
Cu	5-20	7-50	5-20	2-10	6-20	5-10	5-20	5-20	6-30
B	25-60	20-50	30-70	12-35	25-50	15-25	20-80	20-60	15-50

COOPERATIVE EXTENSION SERVICE
University of Arkansas, United States Department of Agriculture, and County Governments Cooperating
FRUIT CROP FOLIAR ANALYSIS INFORMATION SHEET

E-mail: _____

Name: _____

Address: _____

City: _____ County: _____

State: _____ Zip: _____ Fee: _____

County Agent: _____ Date: _____

Field Identification: _____

Crop: _____ Variety: _____ Plant Age: _____

Liming Practice: Year Last Limed _____, Ton/A Used _____

Soil Acidification: Year Sulfur Applied: _____ Rate/A Used: _____

Soil drainage: _____ good; _____ poor

Average shoot growth (inches) in the upper exposed canopy of the tree: _____

or average shoot growth (inches) on current season's growth of grapevines or blueberries _____.

Plant growth conditions appear _____ normal; _____ abnormal.

Crop load this year : _____ none; _____ light; _____ moderate; _____ heavy

Is a herbicide program being used? _____ yes; _____ no

Is an irrigation system being used? _____ yes; _____ no

Fertilizer Program (ground, foliar or fertigation) for the current year
Amount per acre or per tree

Nitrogen _____ Boron _____

Potassium _____ Calcium _____

Phosphorous _____ Zinc _____

Other fertilizers used:

The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, sex, age, or disability, and is an Equal Opportunity Employer.

LABORATORY USE ONLY: Kit No. _____ Laboratory No. _____ Crop Code No. _____
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