HOW TO TAKE COFFEE LEAF AND SOIL SAMPLES (rev. 8/16/23)

Proper fertilizer recommendations cannot be provided with just soil samples. Soil and leaf samples should be taken together and submitted on an annual or biennial basis unless there is a nutritional problem requiring diagnostics. Leaf samples should be taken at or just prior to flowering/bloom when nutritional status within a plant is most stable.

The sample(s) should be representative of the area. Or, collect a sample from trees with similar visible problems to determine if there is a plant nutrition, soil pH, or other problem. Select 5 or more trees to sample from. Mark the trees for sampling in following years or to return to and manage the problem.

SOIL

Soil testing typically determines the level of nutrients (Phosphorus, Potassium, Calcium, and Magnesium) and the pH, a measurement of acidity or alkalinity, of the soil.

HOW TO TAKE A SOIL SAMPLE (Fig. 1)

1. Avoid taking samples during a dry period/drought, right after rain, or immediately following a fertilizer application.
2. Use clean tools, buckets, containers, and bags for sampling.
3. Label a clean, water-proof bag or container with your name, date, host plant, and location from where soil was taken.
4. Midway between the trunk and the drip line (fig. 1), clear the soil surface of debris (leaves, fruit, weeds, etc.), rocks, and any fertilizer residue.
5. Dig down to approximately 6-12 inches or until you reach a mass of roots. Sample closer to the dripline if you are unable to find feeder roots at the halfway point.
6. Collect ½ to 1 cup of soil per tree from at least 5 trees, combine in a bucket or container, and mix thoroughly.
7. Place the entire sample or a subsample of at least 2 cups of soil in the labeled bag or container.
8. Refrigeration is not necessary, but keep out of the sun and heat.

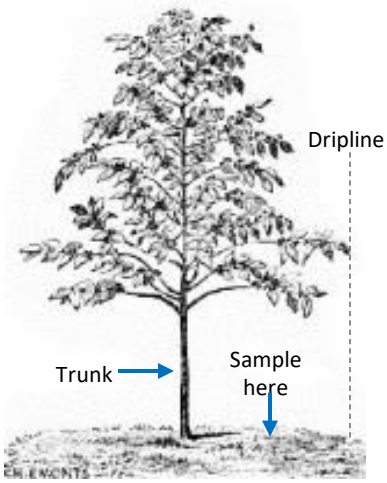

Figure 1: Soil should be sampled from the mid-point between the dripline (widest point of the branches) and the trunk of the tree.

LEAF TISSUE

Leaf tissue testing typically determines the level of nutrients (Nitrogen, Phosphorus, Potassium, Calcium, Magnesium, Iron, Sodium, Copper, Manganese, Zinc, Boron) found in the leaves and nutritional status of the plant.

HOW TO TAKE A LEAF SAMPLE (Fig. 2 & 3)

1. Avoid taking samples directly following a foliar and granular fertilizer application or drought/dry period.
2. Use clean bags for sampling.
3. Label a clean, plastic or paper bag with your name, date, host plant, location from where leaves were taken, and any visual plant problems.
4. Take samples during flowering for best results. This gives you an opportunity to adjust fertilization prior to fruit maturity. Sample also during fruit development if a nutritional problem is suspected.

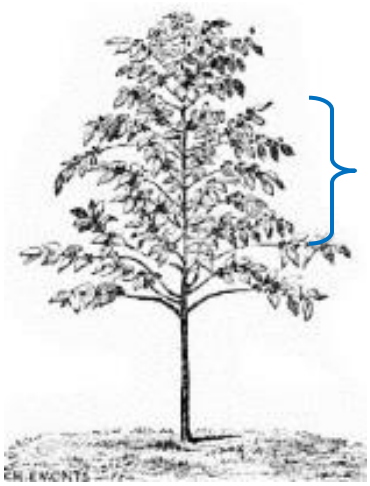
Figure 2: Select leaves approximately mid-way up/down the tree canopy.

5. Select a vertical that is in its second year of growth (first year of cherry production), and then count down from the top of the vertical to the 8th to 12th lateral branch, approximately midway of the tree canopy.
6. Pick one leaf from the most recently matured leaf from the lateral – usually the 3rd or 4th pair back from the branch tip. These leaves should be full-sized, not shaded by neighboring coffee trees, and generally have the same color and texture as older leaves, unless there is a problem.
7. Collect a minimum of 15-20 leaves per sample.
    - Collect 1-2 leaves from at least 15 trees around the farm for a general, representative sample, OR
    - Collect a total of 15-20 leaves when attempting to diagnose a specific nutritional problem.
    - Place leaves in the labeled bag.
8. Keep leaves dry and out of the heat and sun. E.g. Place samples in a cooler and on a light towel covering a bag of ice or an icepack to preserve sample integrity.

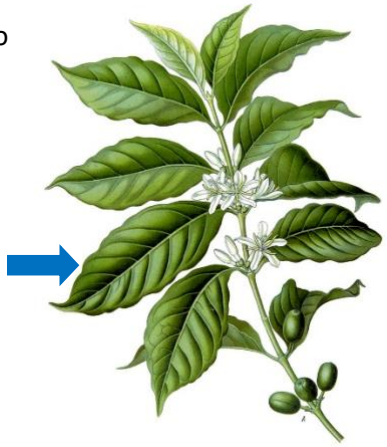

Fig. 2: Some plant nutrients are more mobile or immobile in plant tissues than others. As such, proper selection of leaves from laterals is important for accurate results

9. Prevent decay and rot of leaves. Wipe off any water moisture on the leaves with a clean paper towel and keep in the refrigerator if you are unable to submit the samples for a few days.
10. Do not freeze samples. Refrigeration is ok, but do not place the sample at the back of the refrigerator where it may get cold damage.
11. If sending leaf samples to the mainland, first wipe leaves of residue with distilled water and clean paper towels, then oven dry or dehydrate the leaves at 70°C or 158 °F until crispy and dry like paper. This may take several hours.

COSTS

As of 8/16/23, these are the costs for the various analyses conducted by:

- UH Hilo Analytical Lab in Hilo – https://hilo.hawaii.edu/analab/service.php
- Crop Nutrient Solutions, Inc. – Services and costs
  Peter Bunn, CPAg
  email: pbunn@pixi.com
  cell: 808-386-4120
  CropNutrientSolutions.com
- Maintain a copy of all forms and paperwork sent with the samples.
- Contact the labs directly with any questions regarding forms, costs, payment, shipment, delivery, results, recommendations, etc.

RESULTS

Typically, the sample results are mailed and/or emailed directly to the grower approximately 2-4 weeks after receipt; however, if there is a backlog, it may take longer. For any sample inquiries, please contact the labs directly and have a copy of your forms/paperwork on hand.

This publication was created by Andrea Kawabata (UH-CTAHR; andreak@hawaii.edu) and adapted from V. Easton-Smith's Extension Publication. Information and interpretation of Hawaii soil and various crop tissue results can be found in the following publications.

- Adequate Nutrient Levels in Soils and Plants in Hawaii (General Guide) - https://bit.ly/3g46KdG
- Testing your Soil - Why and How to Take a Soil-Test Sample - https://bit.ly/35nrOJY
- Interpreting Soil Nutrient Analysis Data - https://bit.ly/3G9nISE
- Recommended Plant Tissue Nutrient Levels for Some Plants in Hawaii - https://bit.ly/3raB4d6