

How to prepare soil, tissue, or water samples for lab analysis

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Follow these simple steps to ensure that the samples you send to a laboratory are worth your time and expense. If the sample is not representative, the lab results and their interpretation are worse than nothing.

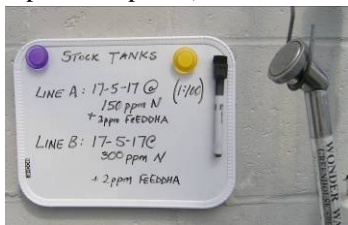
Sample quality improves if you can minimize variability. Always use the same procedure for preparing your samples. Stay with one reputable lab that specializes in greenhouse/nursery samples. Subtle differences in procedure between labs give different results. Labs that do not normally handle greenhouse samples may not include all the information you need or may use an inappropriate procedure.



All samples should be mailed to the lab within 24 hours of sampling. If you need to store samples for longer, refrigerate. Overnight or priority delivery is particularly important for tissue samples (to avoid rot) and water samples (to avoid chemical changes). Pack securely to avoid rupturing the container. Label all sample bags and bottles with your business name and a code that clearly relates the sample to your enclosed paperwork.

Fill out any required laboratory forms in detail. The more complete your information, the better interpretation that the lab, your consultant, or your cooperative extension advisor can provide. Information that is useful to help interpret the sample include:

- Contact person, business name, phone, fax, email
- Age of crop (which might include a pre-plant media test)
- Crop species or group (e.g. general bedding plants)
- Container size (e.g. plugs and bedding plant flats)
- Media type (brand name, formulation, e.g. Brand X Bedding plant special, peat 70%/perlite 30%)
- Fertilizer type (e.g. 20-10-20 peat lite special), concentration (e.g. 200 ppm N), and frequency of application (e.g. every 2nd watering).
- If there is a plant health problem, describe symptoms:
 - Appearance: chlorosis (yellowing), necrosis (dead tissue)
 - part of the leaf: interveinal (between leaf veins), leaf spots or leaf margins
 - part of the plant: new leaves/old leaves/all leaves
 - distribution over the crop: all plants/patchy/describe the pattern
 - when and how quickly the problem occurred: (e.g. past week only)
 - Root health (poor/adequate/good)
 - Can you include a photograph?



To decide **which plants** to sample:

- Select crops that are (a) most sensitive to problems (e.g. petunia for low EC or high pH, New Guinea impatiens for high EC, marigold for low pH), and (b) most financially important.
- Avoid mixing cultivars, or greenhouse zones that are managed differently from each other in terms of growing medium, fertilizer, plant age, or irrigation system.
- Sample problem areas or crops separately from the rest of the crop. If one species has both good and bad areas, send in separate soil and tissue samples from each area for comparison.
- For problem solving, both soil and tissue are very helpful for a complete diagnosis.



To decide **when** to take soil or tissue samples:

- Sample the soil and tissue of important, long-term crops such as poinsettia or stock plants once each month.
- Sample new batches of growing media before planting.
- Sample both soil and tissue when nutritional problems are suspected.

Soil samples

With fresh media (preplant analysis), gather your sample of the growing medium from at least 5 different unopened bags or locations in your bulk pile. Place at least two cups of media into a pot and irrigate with tap water and allow to drain. Leave at room temperature, keeping moist for one week before sending in the sample, to allow the lime and preplant fertilizer time to react.



During crop production, take samples from at least ten pots or flats distributed throughout the group of plants to be sampled.



After you collect subsamples from each pot, the media will be combined to make two cups in total. Each time you measure, you can select from different pots to ensure you are not removing too much media or biasing the results.



Collect a small amount of root medium (a large spoonful) from the bottom 2/3rd of each pot you are sampling. The bottom 2/3rd is typically where the roots are in the pot. Sampling in this way avoids fertilizer salts that can accumulate at the medium surface with all irrigation methods (not just subirrigation).



For small plugs use the complete cell as a sample. Remove the leafy part of the plant. Try to remove roots, but it is not essential that all roots are taken off.



Remove slow-release fertilizer prills if present because they will result in falsely high readings.



When a sufficient amount of root medium is collected, thoroughly mix the sample to ensure uniformity. Place the sample into a clean, new plastic bag. Label the bag with your business name, and a code that clearly links that sample with your enclosed paperwork.

Tissue samples

Sample recently mature leaves combined from at least 20 plants.



When sampling vegetative cuttings, send in the entire cutting if leaves are small.



Obtain enough leaves so that you have two full cups of leaf tissue.



If samples are dusty, dirty or have received overhead fertilizer, submerge and rinse gently in deionized or distilled water to remove contaminants and then pat dry with a paper towel. Do not put wet tissue into a bag or it may rot. Also, do not wash dried tissue.



Place leaf tissue into a new, clean, loose fitting paper bag (the aeration helps dry the sample and delay rotting). Label the bag with your business name, and a code for the sample that clearly relates the sample to your enclosed paperwork. If you have to store the sample for more than 24 hours before sending, refrigerate in a plastic bag and then transfer to a paper bag.

Water and fertilizer samples

Irrigation water should be sampled before each growing season, with a separate sample for each well, pond, or other water source. Sample more frequently if you have a shallow well or suspect changing water quality.



Fertilizer solutions should be sampled if you are mixing your own solution from multiple bags or if you are acidifying for alkalinity control, and need to check the formulation.

If you use commercial blended fertilizers, to check the injector and know the total nutrients you are applying : (a) send an annual laboratory sample of your clear irrigation water in order to know what ions are in the water, and (b) do weekly checks of the water EC and the fertilizer solution EC with your own EC meter and check against the expected EC on the fertilizer bag.

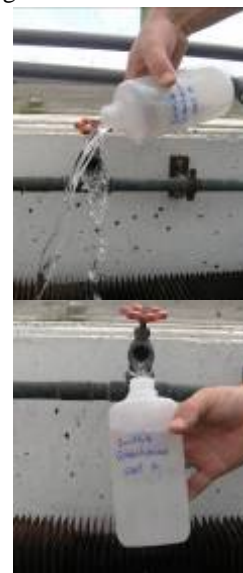
Allow the water or fertilizer solution to run for 5 minutes to clear the lines before sampling. If sampling from a fertilizer tank, ensure the solution is well dissolved and mixed, for example by running a sump pump.

Select a bottle that can be securely tightened, will hold 1 pint of solution, and is clean. If you wash the bottle with detergent, rinse three times with tap water before going to the next step.

Rinse the clean plastic bottle three times with the water or fertilizer to be tested, and empty the bottle each time.

Fill the bottle to the top with approximately 1 pint (2 cups) of water and securely tighten the cap.

Clearly label the bottle with your business name and a code that relates the sample clearly to your enclosed paperwork.



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