



PRACTICE MAKES PROFIT

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Sampling your soil means knowing where your crop has gone and where it is heading. It certainly is an investment. But to maximize this investment, you should get acquainted with how to do sampling in-house or through laboratories and learn how to interpret your results.

Most soil mix companies have their own laboratories, or they contract out with professional laboratories that specialize in soilless media testing. Professional labs' testing procedures are designed for media containing less than 30% field soil and are conducted using the saturated media extract method (SME).

The SME is a water extraction, while field soil analyses are primarily done by grinding the media and using an acid extraction technique. The results are quite different and are not interchangeable with the SME. And pH readings taken on a slurry are typically lower than those taken in the extract.

In addition, it's vital for growers to choose a laboratory and stick with it. Because of differences in procedures and equipment, results may differ. Professional mix companies may offer technical support

The last SUPERVISIONS contained:

- Part 1** - "Five major media components and their properties".
- Part 2** - "Media selection and storage".
- Part 3** - "EC, water quality and pH management".
- Part 4** - in this issue - "Media testing".

to help you interpret your lab analyses.

When you ship out your samples, make sure to include all pertinent information, including your fax number. The biggest delay in receiving complete analyses occurs in getting the sample to the lab. Ground transport via the postal service or UPS may take as much as 1 week for delivery. Overnight or expedited services are fastest.

Once samples arrive at the lab, testing is usually done quickly and results are faxed. If you do not have a fax, get one or access a local service. First-class mail may take 1 week to get a sample to the lab and 1 week to deliver the results. There's no question that 2 weeks could make a difference in your crop's success.

SAMPLING METHODS

Media analyses are snapshots of a particular media at a particular time. A single analyses is not enough for making sound decisions.

It's important to follow the sampling procedures outlined by your lab. For most container media, sample 8-10 pots of the same plant type. Take a top-to-bottom profile of the media from the container

(or where there is active root growth) after removing the top 1/2 to 1 inch of media where salts are concentrated.

Pool these samples, remove large masses of roots, and send the required quantity – usually 1-2 cups – to the lab. The sample's moisture content isn't critical to the SME procedure, so media doesn't have to be dry.

A common zippered lock plastic bag, well labeled, can substitute for an official laboratory sampling container. But be sure to tell the lab if controlled-release fertilizers or fungicides were used with the media. These may effect the interpretation of the salts (EC) readings.

IT'S TEST TIME

For high-value crops, testing every 2-3 weeks is fine as long as weekly tests are done on-site. Samples should be taken at the same interval after fertigation and sent quickly to the lab.

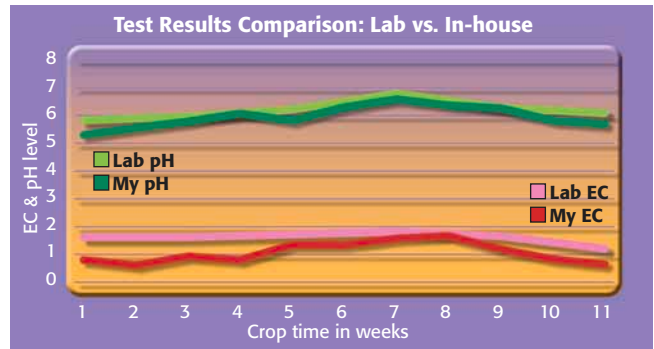


Figure 1: Grower's own weekly EC and pH test results (My pH, My EC) plotted along with bi-weekly lab test results should show similar results from each source.

Test a portion of that same sample using in-house equipment and correlate those results with the lab's (see Figure 1). The values will probably be different but test results should be consistently different.

In problem situations, appropriate comparative sampling between effected and uneffected media and plant tissue can determine if the cause is nutritional. Tissue sampling without corresponding media sampling is almost worthless. Both are needed to make accurate assessments.

If the results don't provide a definitive answer, then examine your environmental or cultural practices. Not all problems with crops result from 'bad media'.

The recent trend toward 'pour-through' sampling requires growers to develop comparative databases for conventional

testing results vs. pour-through results. There is no universal set of reference points at this time for pour-through analyses. All growers must develop these for their particular operation in cooperation with a professional lab.

GRAPHICAL TRACKING

Graphical test results from the lab and from in-house testing provide a picture of your crop's past and its likely future.

Graphical tracking makes it easier to see if

lab and in-house tests are in sync. It's also easier to relate past fertilizer applications or that stretch of cloudy weather to what's happening in your media.

Week No.	Lab pH	My pH	Lab EC	My EC
1	5.96	5.6	1.8	1.0
2		5.8		0.9
3	6.01	5.9	1.8	1.1
4		6.1		1.0
5	6.33	6.1	1.9	1.4
6		6.5		1.4
7	6.8	6.7	2.1	1.5
8		6.6		1.6
9	6.50	6.4	1.9	1.3
10		6.1		0.9
11	6.20	5.8	1.3	0.8

Figure 2: Recording results from weekly in-house tests and periodic lab tests shows crop history and makes graphical tracking easy.

THE FINAL ANALYSIS

The authors of this series on the best management practices for soilless media are all from

different manufacturers. While growers expect quality products from the soilless media industry, the manufacturers expect growers to understand their media, its properties, and its best management practices.

Soilless media are dynamic systems. The raw materials are somewhat variable, the growing conditions in which they are employed change yearly, and the very plants that are grown in them have an effect on the physical and chemical changes that occur. Yet, through careful monitoring and effective management those same media are the foundation for a very healthy industry.

In the future look for even more combinations of materials and additives developed to satisfy environmental and market demands. And remember that change requires adjusting one's habits and systems, and it requires testing and understanding the product.

IN-HOUSE TESTING

Every professional greenhouse and nursery should have a method of testing pH and soluble salts. EC comes from many sources, so verifying the source of the salts needs to be done periodically.

EC and pH can't be accurately measured in the container. It is important to sample uniformly and consistently so that the only variables in the process are the changes in media chemistry.

Soluble salts are best measured by EC meters. Meters which read in total soluble salts or total dissolved solids require conversion of those figures before interpretation.

Reliable EC meters are available for less than \$200, including calibration solutions. Good pH meters are in this price range, as well. pH 'pens' will need periodic electrode replacement. But keep in mind that measurements are practically useless if this equipment is not carefully calibrated and maintained.

Many university researchers and industry consultants recommend testing major crops in-house weekly (see Figure 2). Generally, the pH and EC give growers a good idea of the crop's nutritional status.

The specific source of the soluble salts and the plant nutrition can be obtained through periodic samples submitted to the professional lab.

Then growers can graph the results to better track the crop's nutritional progress.