EVALUATION OF POTTING MEDIA ANALYSIS

FACT SHEET

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Potting media differ greatly from agricultural soils in their physical and chemical characteristics. Potting media may include mixtures of materials such as perlite, expanded plastics, vermiculite, peat, pine bark, wood shavings, sand, and composted materials. The "soilless" growth media have good moisture holding and aeration properties, but can be limited on their ability to hold nutrients.

Fertility management of this media is extremely important. Nutrient levels should be optimized in the growing media prior to planting in order to obtain maximum crop growth.

Balance among the essential plant nutrients, especially potassium, calcium, and magnesium is important. Plant growth is better with balanced nutrient levels even at low fertility. Many artificial mixes may be deficient in micronutrients unless amended. These are best added as a micronutrient mixture to assure proper balance. The pH of the media will influence availability of the nutrients in solution.

In the greenhouse industry, the container and growing media are usually sold along with the plant, requiring constant replacement of the potting media. Prior to using a new lot of potting media, analyses for pH, soluble salt content, and available nutrients should be performed.

Procedures used to test for these parameters are specifically designed for the unique characteristics of potting media. In growth media, the concentration of essential nutrients around the root is critical to plant growth and depends upon the moisture holding capacity of the media. With a given amount of nutrient in a container of growth media, the nutrient concentration around the root decreases as the moisture content increases.

With the saturated media extract procedure, it is possible to use a single set of fertilization guidelines with a wide variety of potting media since the amount of water held at saturation is directly related to the moisture holding characteristics of each media. At complete saturation, the water content of a media is approximately four times that held at the permanent wilting point and about two times that held at the moisture holding capacity. The total soluble nutrient concentration at saturation then is one-fourth that at permanent wilting point and one-half that at moisture holding capacity.

The table on the following page lists several parameters' acceptable ranges. It should be used as a general guideline. Values may change with different plant types and growth stages. For example, there is a wide range of values under "adequate". For young plants or to slow growth rate, keep the nutrient levels at the lower end of the adequate range. To stimulate plant growth, add nutrients to the high end of the adequate range.

EVALUATING POTTING MEDIA ANALYSIS

Using the Modified DPTA Saturated Media Extract *

Parameter	Unit of Measurement	Rating		
		Low	Adequate	High
Soil pH	-	< 5.0	5.0 - 6.8	> 6.8
Conductivity (mature plant)	mmhos/cm**	< 0.7	0.7 - 3.5	> 3.5
Conductivity (young plant)	mmhos/cm**	< 0.5	0.5 - 2.0	> 2.0
Available Nitrogen (NO_3-N)	ppm	< 40	40 - 200	> 200
Phosphorus	ppm	< 3	3 - 10	> 10
Potassium	ppm	< 60	60 - 250	> 250
Calcium	ppm	< 80	80 - 200	N/A
Magnesium	ppm	< 30	30 - 70	N/A
Sodium	ppm	-	0 - 80	> 80
Sulfur	ppm	< 20	20 - 200	> 200
Boron	ppm	< 0.5	0.7 - 2.5	> 2.5
Iron	ppm	< 15	15 - 40	> 40
Manganese	ppm	< 5	5 - 30	> 30
Zinc	ppm	< 5	5 - 30	> 30
Copper	ppm	< 2	2 - 30	> 30
Chloride	ppm	< 2	< 45	> 45
Fluoride	ppm	-	< 5	-

* Adapted from Saturated Media Extract Method by D. D. Warncke. NCR Publication No. 221(1998), pp 61 - 64.
** Soluble salts (ppm) = conductivity (mmhos/cm) x 640

GENERAL GUIDELINES FOR ADJUSTING GROWTH MEDIA

To lower soil pH by one unit (7.5 to 6.5), add 3 pounds of iron sulfate per cubic yard.
To increase soil pH by one unit (4.5 to 5.5) in a weakly buffered growth media, add two pounds of finely ground lime per cubic yard, and five pounds of lime in a highly buffered growth media.

High soluble salt levels can be minimized by watering to cause some leaching. Extremely high soluble salt levels may require repeating this procedure several times.

Many of the calcium carriers are slowly soluble so that equilibrium will not be reached if the stockpiled media is kept dry. As a result, the calcium content in a saturation extract may not accurately reflect the available calcium content of the growth media.

To increase the nitrogen extract test level by 10 ppm, add 2 ounces of calcium nitrate (15-0-0) per cubic yard of media (75 grams per cubic meter). To increase the phosphorus extract level by 10 ppm, add 2 pounds of 0-46-0 per cubic yard of media (1200 grams per cubic meter). To increase the potassium extract level by 10 ppm, add 1.5 ounces of potassium nitrate (13-0-46) per cubic yard of media (55 grams per cubic meter).