

GROWERTALKS

Features

5/1/2018

8 Questions, 16 Answers

Featuring Lynn Griffith & Dr. John Peterson

GrowerTalks: What's the most important characteristic of a good potting media?

Lynn Griffith: Consistency, first and foremost. Whatever the mix is, it needs to be consistent physically and chemically, load to load and bag to bag. Most media companies are primary producers of one or two ingredients, usually peat. They have to buy the rest of the ingredients, so consistency is a challenge for them as well.

Second, longevity of physical structure in long-term crops. Growers should get the physical characteristics of their mix right first and then work on the nutrient levels, pH, etc.

Dr. John Peterson: There is no one characteristic that is the most important aspect of a good potting media. It's important to have a good balance between water-holding capacity, aeration, nutritional properties and to recognize that potting media is a component of a growing system.

Other factors—such as the type of plant being grown, the kind of irrigation system being used and the environmental conditions in the growing area—are factors that influence what the optimal characteristics are for the ideal potting media. Having a stable, well-aerated medium that has good water-holding capacity is a good starting place and then formulating a good nutrient program that is optimal for the specific plant species being grown and an irrigation system/program that complements the potting media is very important.

GT: How important is pH?

LG: It depends on the plant. Aglaonemas grow fine at pH 4 or pH 8—a thousandfold difference in acidity. But with geraniums, get too far away from 6.0, and you've got problems. pH affects much more than availability of nutrients. It affects potential plant toxins, as well as the growth of both beneficial microbes and plant pathogens. ([See the October 2017 issue of *GrowerTalks*](#) to learn more).

JP: While there are some plants that have specific optimal pH requirements, some require a low pH range of 4 to 5 and some require a mid-range of 5 to 6, and yet others grow better at slightly higher pH of 6 to 6.5. Most plants will do well in organic potting media if the pH is 5 to 6.5.

A key consideration is the alkaline or acidic character of the irrigation water or fertigation water. Upward or downward drift during the growing period is important to consider. While nutrient availability might be more optimal at a slightly lower pH in organic media, we now know that beneficial microorganisms prefer a slightly higher pH. So if you want to maintain a good population of beneficial microbes, it is best to avoid a pH that gets lower than about 5.5. We also know that the chelation of some plant nutrients is very beneficial for maintaining nutrient availability and uptake, and mitigates the need to be too concerned about pH drift up or down.

GT: Do nutrient ratios matter?

LG: I've seen about 1.5 million soil and media analyses in my career, and about half a million leaf analyses. Many times when diagnosing a crop symptom, there are clearly not any overt deficiencies or toxicities in the analyses. However, when that happens, I usually find the answer in some of the ratios. I especially look at iron to manganese ratios, calcium to magnesium ratios, and others. Using ratios is a great diagnostic tool.

JP: Nutrient ratios are important for some elements and for some plant species. For plants having high iron requirements, there is often a need to not let manganese levels be high. The balance between calcium and magnesium is sometimes an important factor, and something to be very aware of when water supplies have a naturally high level of one of these elements. High potassium levels can also inhibit magnesium uptake.

Nitrogen source ratios of urea, ammonium and nitrate are important, too. A bit of urea or ammonium will promote rapid growth, however, a good portion of nitrate can be "safer" for plants, particularly in darker weather and in growing media that have low levels of beneficial microbes. And there are other competitive nutrient uptake and utilization relationships. So, yes, nutrient ratios can be very important considerations.

GT: Is saturated media extract a good testing method for all media?

LG: Let me tell you a dirty little secret: Soil testing labs don't actually analyze soil. They analyze EXTRACTS of soil. Saturated paste with distilled water is fine for potting media, but not soil. Extracting methods designed for soil are usually too strong for media. Soil binds nutrients more tightly than substrate. Pour-through and 2:1 dilutions are usually more practical for growers to perform themselves on-site.

JP: The saturated media extract method is a very good method for testing organic-based potting media. I believe it is the preferred method for evaluating nutrient availability in organic media, especially for greenhouse crops, as it seems to reveal the readily availability of root zone nutrients.

Other methods of analysis can also be very effective nutrient monitoring nutrient status. A key is to consistently use the same methodology to develop a long-term database for managing fertilization programs at a specific crop production facility. In the end, some regular program of monitoring nutrients in the growing media is a critical factor, as it is one of the only plant growth factors that we can't readily perceive with our human senses.

GT: What about using compost as a substrate ingredient?

LG: Many composts are alkaline. They can shrink or heat up if not fully composted, so the process needs to be complete. I prefer to keep the percentage of compost at 15% or less. Make sure your compost is well cured so that the carbon-to-nitrogen ratio is not elevated. And lime rates may need adjusting when using compost.

JP: If a source of compost is consistent in its physical and nutritional character and its physical characteristics, and it is stable over time, it can be a very good component of potting media.

In recent years, I am a lot more intrigued and confident that soil microbes are an important part of the root zone environment, even for short-term crop production. We now know better than ever that there are beneficial fungi and bacteria that do really good things for plant roots. Compost can often be a source of inoculum of the beneficials, however, we don't always know they are there and there really aren't easily performed testing methodologies.

GT: What are your thoughts on using coir (coconut fiber)?

LG: Coir grows an excellent root system. It usually has a good pH, high potassium, but low calcium. Salt problems are generally not a factor anymore with coir products. Growers may have to irrigate a little differently when using coir, as it wets and dries differently than sphagnum peat. A combination of the two works well for many situations.

JP: Coir has become an important and good substitute for peat moss in many plant production programs. If the sources, and consistent physical and nutritional character of this product are maintained and are stable, it is likely to continue to be a highly utilized component of potting media. It is a renewable resource, which is good, and it seems to be more quickly regenerated than peat moss.

There are different environmental, labor, economic and global issues associated with coir as compared to peat moss, which may or may not make it a long-term sustainable resource. As we continue to expand our knowledge of managing the physical and nutrient properties of coir, it will probably remain a good option for formulating potting media. It is important to know that it is different than peat moss, and adjustments in irrigation and fertilization practices must be made.

GT: How important is sustainability where media ingredients are concerned?

LG: I think it matters to a certain sector of the retail market. I believe most media ingredients are pretty sustainable, especially coir, bark and compost. Sphagnum can be mined responsibly and it's going to be around for centuries. My trademarked company slogan is "Get the Soil Right"—I think that is what most growers are trying to do. The best investment a grower can make is a good potting media.

JP: Sustainability of components of growing media is an important long-term issue and it is a dynamic issue. Changes in global relations, labor and shipping costs, mechanization and pollution issues—let alone tariffs, fuel and transport—are all factors that may impact the availability of certain potting media components. Fortunately, the sources for our current primary components of potting media look pretty good for many years to come. And as long as a component isn't toxic to plants—and we can adjust and maintain the proper nutrient, water relations and aeration for plant root growth and functions—we can figure out how to grow in almost anything.

Like coir, there may be other growing media components that emerge as new viable potting media components. Fortunately, we have the knowledge and understanding to be able to adjust and manage the key factors that should enable us to make any new, lower-cost, consistent and readily available product viable as a new and effective component of growing media.

GT: What about some of the newer ingredient options, such as processed wood fiber?

LG: My experience with them is somewhat limited, but generally positive. Most of them don't seem to shrink or cause nitrogen loss. The type of wood and the processing are important. Using recycled materials as potting media is certainly intriguing. The challenge is making it work.

JP: While we probably figure out how to grow in almost anything that is not toxic or lacks water-holding capacity or aeration, from my vantage point I have not seen anything that is relatively new and interesting or a significant innovation in potting media components. Wood fiber, which is readily available, has been used on occasion for many decades, but it always has had some challenging characteristics that seem to lead to sequestering essential nutrients, rapid oxidation and roller coaster nutrient relations. We are, and should always be, on the lookout for new components, and I'm sure some will arise. But as of yet I'm not seeing any new components that excite me.

The one aspect of growing media additives that intrigues me is the addition of beneficial microorganisms, as I think there is evidence that they enhance nutrient balance, uptake and utilization, and suppress pathogenic organisms, and in general improve plant health and growth rate. However, we still have a lot to learn in this aspect of growing media and plant growth relations, and the economic value of these products is not clear. **GT**

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