

Soils and Fertilizer: Part of a Much Bigger Puzzle®

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Matching the right fertilizer to a mix is more like working a puzzle. In my 30 years of traveling throughout the nursery industry, I've come to learn that what works in Missoula may not work in Memphis or Miami. Our industry is blessed with organizations such as IPPS where free flow of information is the norm. So in our travels we learn that growing this plant with this fertilizer at such and such location is successful. We then proceed to go home, institute similar protocol, and fine our results quite different. Why? How our media interacts with assorted fertilizers greatly influences the outcome of the plant.

Four components make up this puzzle: media, fertilizer, water, and plant species.

If bark is added to a soil mix which in our industry is the norm, the source of the bark and its age will influence how fertilizer reacts with the plant. If it's green bark, more nitrogen draw down will occur either requiring more nitrogen to be applied or a type of fertilizer that has significant uncoated or slow-release nitrogen available. If the bark is aged and, better yet, composted less fertilizer will be required to feed the bark and more will be taken up by the plant. Simple enough! Is the bark hardwood or pine/conifer? Pine is the preferred source since it is stable after the composting process, hardwood never stabilizes. Instability as with anything in life is not something we seek. Hardwood also increases the pH of the mix and introduces significant more minors than you may need. Has the bark been screened? If not then these fines will increase the cation ion exchange capacity and water holding capacity of the mix. Fines usually will allow lower rates and slower starting fertilizer. Similar to what peat does to a mix. Compost has even more of these characteristics and characteristics similar to hardwood bark. Aggregates such as pea gravel, pumice, or perlite increase porosity which affects the rate of fertilizer used.

When choosing a fertilizer we need to know if its release process is fast or slow. Is it completed coated, are uncoated components present? Are they slow release or agricultural grade? Longevity will dictate how fast or slow a product releases along with the timing of the application. If we incorporate a premix or starter charge to a mix this can influence how we want our fertilizer to release, our rate, and analysis; also if we liquid fertilize as a supplement this can affect our rates and analysis.

Since we are in the business of growing plants, all this comes back to how the plant reacts. Unfortunately not all plant species react the same way to the same fertilizer or the same mix. Now the puzzle begins to form.

Bark should have a pH range of 4.5 to 6. Older bark that is pine or conifer has a higher pH range. Pine also contributes to lower EC's than hardwood bark. If you ever want to check the age of the bark, a test by an accredited soils lab that does a carbon to nitrogen ratio will confirm this. Without going into too much detail a C/N ratio above 130 is usually fairly green. Below 100 is well aged. If you plan on using greener bark one way to "safen" the bark is by adding additional slow-release nitrogen. You can accomplish this by adding more of your actual production fertilizer however it is more economical just adding more nitrogen 1-3 lbs per yard of urea

formaldehyde (blue chip), methylene urea, or a polymer- or sulfur-coated urea will solve this problem.

If you are using a significant amount of unscreened bark fines, peat, or compost this will allow you to use less fertilizer, quite often less or no minor package. Any of these components added to a mix will force you to be more conscious of salt build up within the mix. This becomes more apparent when either you are not watering frequently, experience drought conditions, or using a faster-release fertilizer. Salt-sensitive plants will begin to talk to you quickly when the above scenarios occur.

On the flip side, if your mix is primarily bark or has a large percent of aggregates, more fertilizer is necessary. Since you must water more frequently with a more porous mix some of the fertilizer may leach before the plant needs are met. When plants are young the nutritional demands of a plant are less so more of the fertilizer may leach. Areas of high ambient rainfall usually need a more porous mix and their fertilizer rates are higher accordingly.

When evaluating fertilizers for the first time, remembering the items we discussed earlier, and then look at the label. Determine if the product is 100% coated. If so find out from the manufacture if there is different coating levels blended together. If a portion of the product is uncoated determine the percent and the actual element that is not coated. If it is slow release, many of these products release faster with more water. This may or may not be what your needs require or appropriate for your growing environment. Rates of fertilizers from manufactures are based on a national scale. So it may work in Missoula but not so much in Maine. Recommended rates are just that, recommendations. Not meant to be gospel. If we are adding a premix we may not need a faster starting production fertilizer, especially if the mix is finer or watered less frequently.

So our puzzle pieces are beginning to fit together. The plant is the final puzzle piece. The growth cycle of the plant can determine the longevity and rate of fertilizer in conjunction with our mix characteristics to reach a finished saleable plant.