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Phosphorus in Fertilizer

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Orchid Growing Tips

Winter might seem like a strange time to be discussing fertilizer, as orchids require less fertilizer this time of the year. However, this is the time where the success of our growing, including fertilizer application, is manifested in the flowers we admire in our growing space. In December's column the results of a Texas A&M study on application rates and forms of nitrogen fertilizer on growth of Phalaenopsis were discussed. A second part of the study addressed the value of high phosphorus fertilizers.

The fertilizer mantra is that high phosphorus fertilizer should be applied to phalaenopsis (and other orchids) a few months before they flower to both instigate bud formation and increase flower count. Typically, the fertilizer regimen also includes reducing nitrogen fertilizers so that the orchid can concentrate on blooming and not growing. This was the premise tested at Texas A&M on phalaenopsis.

Phalaenopsis treated with high phosphorus and low nitrogen produced fewer flowers than those fertilized with a balanced fertilizer 20-20-20, no matter what the frequency of fertilizer application. The researcher's conclusion was that the plant had already stored all the phosphorus required to bloom in its tissues so the extra fertilizer phosphorus did not matter. There might have been different results if the plants had not regularly been receiving an excess of phosphorus. As with nitrogen fertilizer, the medium in which plants were grown may be the reason this study came to a different conclusion that conventional wisdom. The medium was 70% fir bark and 30% peat. The fine peat particles have an enormous capacity to hold nutrients like phosphorus. As a result, all treatments provided as much as an individual plant could take up. Phalaenopsis grown in a medium, such as fir bark alone that did not retain phosphorus might have needed additional phosphorus to flower well.

Phalaenopsis do not have obvious storage organs, such as pseudobulbs but are thought to store nutrients they take up and energy they acquire from sunlight in their leaves. How important are these stores to the ability of a plant to flower? That question was also addressed in the Texas A&M study. Very important was the conclusion as flower count was reduced if fertilizer was reduced before spikes were formed, during the time spikes were forming, and even after flowers on the spike had begun to open. So, if you want the biggest and most flowers possible on your phalaenopsis do not stop fertilizing after plants begin spiking. At least that was the conclusion in this controlled study under ideal conditions.

Now the really big question! Does the exact formulation of a fertilizer really matter to the plant? Levels of nutrients (N-P-K) in leaves were compared to levels of these nutrients applied through different fertilizer formulations. In this study, plants were grown in bark only as well as the 70% bark, 30% peat medium. Plants grown in the bark medium were all smaller, confirming the value of peat to mixes. The surprise was that plants grown in bark accumulated more phosphorus in their leaves (as a percent) than those in a medium with peat added. The big news from this experiment was that each plant took up the same amount of phosphorus regardless of the medium. Plants grown in the peat mix were larger, but had less percent phosphorus.

No matter what fertilizer was used including, 10- 30-20, 20-20-20, 20-5-19, and liquid 2-1-2, leaves contained about the same levels of nitrogen and potassium in both media. The

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conclusion is that fertilizer formulation is less important that the constant application of fertilizer. Nitrogen levels or fertilizer formulation did not affect flower size.

Dr. Yin-Tung Wang published the full article in the summer issue of Phalaenopsis 2002. Dr. Wang also provided a few additional observations useful to orchid growers that relate to other genera as well. His observation that most water was lost from pots through evaporation reinforces the importance of flushing pots thoroughly at least once a month. This is even more critical if high levels of fertilizer are applied.

Do not forget that fertilizer application is not independent of other aspects of culture. The ability to apply the levels of fertilizer used in this study requires relatively rapid drying of the media so that more fertilizer can be applied. The ability of a grower to maximize growth of an orchid depends on other variables, especially light levels, temperature, air movement, medium, pot size, etc. Perhaps the bottom line of this study is that the type of fertilizer does not matter as much as the importance of rate of application.