

Nitrogen source determined significant for inflorescence development in *Phalaenopsis*

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This is Sogo Yukidian 'V3' photographed at a nursery in Taiwan. The variety was used in a study of nitrogen significance in production of the popular moth orchid. Credit: Yao-Chien Alex Chang.

The *Phalaenopsis* orchid, also known as the moth orchid, is the most important pot flower in terms of market value in the world's major floriculture markets. Because nitrogen significantly affects the growth

and flowering of *Phalaenopsis*, nitrogen needs during flowering are of particular interest to growers. Researchers Hadi Susilo, Ying-Chun Peng, and Yao-Chien Alex Chang from the Department of Horticulture and Landscape Architecture at National Taiwan University published a study in the *Journal of the American Society for Horticultural Science* that determined the importance of providing *Phalaenopsis* with ample nitrogen fertilization at its various growth stages.

"To our knowledge, the relative contributions of stored [nitrogen](#) (N) and recently absorbed [fertilizer](#) N to the developing inflorescence had not been studied in *Phalaenopsis*," the authors said. "The relative contributions to the stored N pool of N accumulated during the different growth stages during the long vegetative period of *Phalaenopsis* cultivation were also unknown. The objective of our study was to bring answers to these unknowns."

The team used N-labeling—a powerful research tool for accurately determining the fate of nitrogen in the environment—to compare the contributions of fertilizer N, applied before or after spiking, to the developing inflorescence, and compared the [relative contributions](#) of fertilizer N absorbed during various stages of the vegetative period to the stored N pool. "The nutritional study of *Phalaenopsis* is difficult with traditional methods because it has a strong buffering capacity against nutrient deficiency, but we used ¹⁵N-labeling with the enrichment method to accurately trace the absorption and partitioning of fertilizer N in *Phalaenopsis*," the scientists said.

The results of multiple experiments showed that inflorescence is a major N sink during the reproductive stage of *Phalaenopsis*. "Fertilizer applied during the reproductive stage is a significant N source for the inflorescence development of *Phalaenopsis*, whereby current fertilizer application supplies 57% of the N required for inflorescence development. Therefore, providing sufficient fertilizer N is important

during the reproductive stage to ensure the quality of flowering," the authors said.

Further experiments showed that, even when ample fertilization was provided during the reproductive stage, 6-8% of the nitrogen accumulated during growing Stage I (small plant in 4.5-cm pot for 5 months), Stage II (medium plant in 8.5-cm pot for 5 months), and Stage III (large plant in 10.5-cm pot for 5 months) ended up in the inflorescence at the visible bud stage. At the "two-third flowers open" stage, 12-16% of the N accumulated in the plant during these three stages ended up in the [inflorescence](#). The scientists concluded that these results indicated the importance of providing *Phalaenopsis* with ample N fertilization at all growth stages.

More information: The complete study and abstract are available on the ASHS J. Amer. Soc. Hort. Sci. electronic journal web site: [journal.ashspublications.org/c ... nt/139/1/69.abstract](http://journal.ashspublications.org/c...nt/139/1/69.abstract)

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