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Effects of Different Levels of Potassium and Calcium on Growth, Nutrients Concentration and Yield of Vendetta Cut rose Flower (*Rosa hybrida L*)

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Abstract

Growth, nutrients concentration and quality of rose flowers *(Rosa hybrida L.*) were evaluated under different potassium (K) and calcium (Ca) levels in the nutrient solution. This experiment was conducted as factorial in a randomized complete block design with four replicates on rose plants cultivar "Vendetta" under hydroponic conditions during 2007-2008 at Safi Abad Agricultural Research Center, Dezful, Iran. Rose plants were grown and irrigated with nutrient solutions having three K concentrations of 1.0, 5.0 and 10.0 mM in combination with two Ca concentrations of 1.6 and 4.8 mM. The results indicated that vegetative growth indices were not affected by different K and Ca concentrations in the nutrient solutions. Furthermore, increasing the K concentration in the solution significantly increased ($P< 0.01$) K concentration in rose parts, but markedly suppressed the Ca concentration of roots, leaves and petals as well as the Mg concentration of roots and leaves in rose plants. A regression relationship (r^2= 0.78) was observed between the Ca and K concentrations of the leaves. However, application of Ca decreased K concentration in all of the rose parts and also increased the Ca concentration in various rose parts, expect leaves. At both harvesting dates of rose flowers, application of K at a concentration of 5.0 mM in nutrient solution, enhanced yield of the flowers more than the other K levels. Meanwhile, increasing the Ca concentration from 1.6 to 4.8 mM, markedly increased the yield of flowers. These results suggest that in order to decrease antagonistic effects between K and Ca and at the same time improving rose nutritional balance and yield, the application of combined 5.0 mM K and 4.8 mM Ca are recommended for Vendetta cut rose production in hydroponic condition.

Keywords: *Calcium, Growth, Hydroponic, Potassium, Rose Flower, Yield*