

**Multivariate analysis of mineral composition on the stem and leaf of rose geranium (Pelargonium graveolens L.) affected by calcium to magnesium ratio, amended with mycorrhizal fungi and static magnetic field**

**Abstract**

The objective of this study was to assess the complex phenomenon of adding magnetic fields to calcium to magnesium ratio amended with mycorrhizae on mineral utilization of rose geranium. Multivariate analysis was used to identify the most significant descriptors in capturing the mineral composition in the leaves and stem of rose geranium. Amongst the observed variables, only two principal components accounted for most of the variabilities. The first principal component (PC1) accounted for 27.23%, while the second principal component (PC2) accounted for 23.78% of the total variance. PCA showed that the application of SCa:SMg and HCa:LMg ratio together with magnetic field and zero mycorrhizal fungi contributed positively to the accumulation of N-stem, B-stem, Fe-stem, P-leaf, Cu-leaf, Zn-leaf and with Fe-stem, Cu-stem, Cu-leaf) being negatively affected by the same treatments. Whilst Increasing Mg and lowering Ca in the nutrient solution in combination with magnetic field and mycorrhizae contributed significantly positive to the loading of P-stem, K-stem, Mg-stem, S-stem and K in the leaves, however Zn-stem, N-leaf, Mg-leaf, B-leaf, Zn-leaf were negatively loaded on LCa:Mg1MF0Myco. In conclusion PCA showed synergetic relationship between nutrient elements on rose geranium affected by the ratio of Ca:Mg and MF gradients as well as mycorrhizal fungi.

**Keywords:** Magnetic field, mycorrhizal fungi, minerals, principal component, multivariate analysis.