

## Effect of salinity and supplementary calcium nitrate on quantitative and qualitative properties of *Rosa hybrida* 'Ilona' under hydroponic conditions

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### Abstract

In order to investigate the interaction effect of salinity and supplementary calcium nitrate on growth, quantitative and qualitative attributes of flowers and mineral composition of *Rosa hybrida* 'Ilona', a factorial experiment was carried out in completely randomized design with three replications. Treatments consisted of four sodium chloride rates (0, 5, 10 and 20 mM sodium chloride) and four supplementary calcium nitrate rates (0, 1, 2, and 3 mM) and three replications, under hydroponic conditions. Results showed that sodium and chloride ions' concentration in rose leaves was increased to toxic levels as the sodium chloride rates were increased which in turn resulted in a significant reduction in the number of flowers per plant, dry flower weight, flower stem diameter and flower vase life. Also, salinity reduced the concentration of nitrogen, calcium and potassium in the plant leaves. The use of calcium nitrate could somewhat alleviate the adverse effects of salinity. At each level of salinity, calcium nitrate consumption decreased leaf sodium and chlorine concentration and increased nitrogen and calcium content of leaves, number of flowers per plant, flower diameter and flower vase life. Significant decrease in dry weight and number of flowers per plant were respectively in the salinity range of 2.85 to 3.15 and 3.50 to 4.19 dS/m. In these salinities, the average concentration of sodium was equal to 0.34 and 0.46 while chlorine concentration was 0.36 and 1.42% respectively. With increasing salt stress, the effect of calcium nitrate on the improvement of flower vase life was decreased and more calcium nitrate was needed to supply nitrogen and calcium to the plant. Therefore, it could be concluded that under salt stress, the nitrogen and calcium requirements of the plant are higher than non-saline conditions. The results of this research showed that with increasing the salinity, supplementation of calcium nitrate can reduce the adverse effects of salinity on rose flower under hydroponic conditions.

**Keywords:** Sodium, Potassium, Chlorine, Flower components, Vase Life.

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