

Effects of different amounts of ammonium and calcium in nutrition solution on nutritional status, yield and quality of rose (*Rosa hybrida* L.) in hydroponics

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Abstract

In order to investigate the effect of form of nitrogen (N) [ammonium (NH₄) and nitrate (NO₃)] and calcium (Ca) levels of nutrition solution on quantitative and qualitative yield of cut rose flower (*Rosa hybrida* L.), cv. Vendentta, in soilless culture condition, an experiment was conducted in greenhouse of the National Ornamental Plants Research Station of Mahallat. The experiment was factorial, with completely randomized blocks design, and two factors including NH₄ at three levels (0, 2.5 and 5.0 mM from 10 mM total N and the rest as NO₃), and Ca at two levels (1.6 and 4.8 mM). Results showed that increasing NH₄ concentration of nutrition solution from 0 to 2.5 mM, increased the number of cut flowers, peduncle length and fresh stem weight; whereas, 5 mM NH₄ concentration decreased significantly the number of cut flowers, flower diameter, peduncle length, vase life and fresh weight of stem. Increasing Ca concentration of nutrition solution enhanced significantly flower diameter and fresh weight of cut flowers. With application of NH₄ in nutrition solution (increasing NH₄ to NO₃ ratio), Ca and K concentration of leaves was reduced, and P, Zn, Mn, Fe and B concentration was enhanced significantly. Increasing Ca concentration in nutrition solution enhanced N, Ca, Mn and B and reduced K, Zn and Cu in rose leaves significantly. According to the results of this experiment, application of 2.5 mM NH₄ (25% total N of nutrition solution) along with 4.8 mM Ca, improved growth and some qualitative indices of rose flower (cv. Vendentta).

Keywords: Nitrogen, Plant nutrition, Soilless culture.

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