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 (NH_4) and nitrate (NO_3)] 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 NH_4 at three levels (0, 2.5 and 5.0 mM from 10 mM total N and the rest as NO_3), and Ca at two levels (1.6 and 4.8 mM). Results showed that increasing NH_4 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 NH_4 concentration decreased significantly the number of cut flowers, flower diameter, peduncle length, vaselife and fresh weight of stem. Increasing Ca concentration of nutrition solution enhanced significantly flower diameter and fresh weight of cut flowers. With application of NH_4 in nutrition solution (increasing NH_4 to NO_3 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 NH_4 (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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