Effect of urea: ammonium: nitrate ratios in nutrient solution on photosynthesis and quantitative properties of rose cut flower in soilless culture

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Abstract

In order to investigate the effects of different forms of nitrogen in nutrient solution on photosynthesis rate and quantitative properties of rose cv. Dolcvita, an experiment was conducted in a randomized complete blocks design with seven ratios of urea: NH_4^+: NO_3^- (0-100-0, 0-50-50, 0-0-100, 50-0-50, 25-25-50, 15-15-70 and 0-0-100) and three replications, in a hydroponic greenhouse which grows rose flower. The rooted plants of rose cv. Dolcvita were potted filled with perlite and cocopeat (50:50) substrates. Then, quantitative properties such as plant stalk height, bud length, diameter of bud and stem, leaf area index, vase life, fresh weight of stalk, leaf greenness and photosynthesis parameters were measured. The results showed that increasing the ammonium in nutrient solution reduced the photosynthesis rate, water use efficiency and leaf mesophyll efficiency. The highest stalk height was obtained from 25-25-50 and 0-0-100 treatments (88.3 cm and 86.9 cm), respectively. The highest fresh weight of stalk was obtained in 0-0-100 treatment. Application of 50-0-50 treatment increased leaf greenness as compared to other treatments. When ammonium was increased in nutrition solution, the vase life was reduced. The highest and lowest vase lives were obtained from 25-25-50 and 100-0-0 treatments (17.6 and 11.1 days), respectively.

Keywords: Vase life, Photosynthesis, Nutrients.

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