

Abstract

In the recent years, production of cut flowers such as liliun has been popular in Iran. Flower quality is of special importance in liliun flower production process that proper fertilization is one of major effective factors. This research was conducted to investigate the effect of different concentrations of potassium silicate, nano-silicon and calcium chloride on the quantitative and qualitative characteristics of Asiatic lily "brunello". The experiment was carried out based on randomized complete blocks design with 9 treatments and 3 replications, at Isfahan University of Technology educational and research greenhouses. Treatments included drench of potassium silicate in three concentrations (25, 50 and 75 mg/l), spray of potassium silicate in concentration of 25 mg/l, spray of calcium chloride in two concentrations (25 and 50 mg/l) and spray of nano-silicon in two concentrations (12.5 and 25 mg/l) and control. Quantitative and qualitative characteristics such as plant height stem diameter, wet and dry weight of pedicel, number of florets, florets diameter, tepal length, flower postharvest longevity, leaf relative chlorophyll content, concentrations of calcium, magnesium, potassium and silicon in the leaf and stem was measured. Results showed significant differences between treatments in the stem and leaf calcium, stem magnesium, leaf potassium, stem silicon, relative chlorophyll content at harvest time, dry weight, the number of florets, flower postharvest (5% level), height and leaf magnesium and silicon (One percent level). Spray of calcium chloride in the concentration of 50 mg/l showed maximum leaf calcium, magnesium and potassium. Spray of calcium chloride in the concentration of 25 mg/l resulted in maximum stem calcium and dry weight. Calcium chloride significantly increased wet weight of pedicel at harvest time in comparison with potassium silicate and nano-silicon,. Drench of potassium silicate in concentration of 25 mg/l had the maximum stem magnesium and number of florets (5.27). Treatment of 25 mg/l drench of potassium silicate, increased the number of florets than control %15.18. Maximum chlorophyll content at harvesting time and flower postharvest longevity was related to spray of potassium silicate in concentration of 25 mg/l. Spray of potassium silicate significantly increased flower postharvest longevity than drench one day. Treatment of drench of potassium silicate at concentration of 75 mg/l, showed the maximum height. Maximum concentration of leaf silicon was in treatment of 25 mg/l nano-silicon that this treatment than control increased leaf silicon %51.68. Maximum stem silicon was in concentration of 75 mg/l potassium silicate. and it increased by %48.02 in comparison with control. There was no significant difference in the cases of the stem diameter, floret diameter, tepal length, pedicel wet weight, leaf relative chlorophyll one week before and after harvesting and stem potassium content, between treatments. To sum up, it seems if the objective is production more florets, potassium silicate drench in concentration of 25 mg/l is the appropriate treatment and if the improving postharvest longevity of liliun flower 'brunello', is considered potassium silicate spray in concentration of 25 mg/l is appropriate treatment. Concentration of 75 mg/l drench of potassium silicate can also increase the height of liliun flower. In general potassium silicate was more effective on improving liliun qualitative and quantitative characteristics than calcium chloride and nano-silicon.

Keywords: Potassium silicate, nano-silicon, calcium chloride, nutrition, flower postharvest longevity, Liliun, brunello