

Growth reactions, yield and quality of greenhouse cucumber to foliar application of silicon

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Abstract

Silicon (Si), as a beneficial or quasi-essential element, has different effects on physiological and biochemical processes in plants. But, many greenhouse growers in Iran, especially in soilless system (hydroponic), do not use Si in their recipe and fertilization program. This experiment was conducted to assess the effects of foliar application of different Si levels (0, 50, 100 and 150 mg/L) on morpho-physiological characteristics of cucumber (*Cucumis sativus* L., cv. Negin) in a commercial soilless greenhouse, located at Piranshahr city, West-Azarbaijan province, Iran. Based on the results, Si foliar application significantly increased total chlorophyll, leaf relative water content (RWC), leaf calcium (Ca) and Si uptake and stability of cellular membrane, as compared to control treatment. Maximum yield and Ca uptake were observed in 100 and 150 mg/L concentrations. The highest fruit shelf life, as one of the main cucumber quality components, was observed in 150 mg/L Si foliar application, which was 29% higher than control treatment. Based on the results of Si foliar application, increasing the leaf area and total chlorophyll content and improvement of RWC increased the yield and postharvest longevity of cucumber fruit (Negin cultivar). Consequently, foliar application of Si in soilless production of cucumber is recommended.

Keywords: Plant nutrition, Silicon, Beneficial element, Hydroponic, Shelf life.

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