

ABSTRACT

Sorghum is a food crop that has the advantage of being able to withstand dry land compared to other food crops such as rice and corn. As a gramineae plant, sorghum requires Si, while the availability of silica decreases due to Si not being added from outside so the plant lacks Si. The aim of this research is to determine the response of vegetative and generative growth of sorghum plants to nanosilica treatment with different doses and the optimal dose for vegetative and generative growth. The variables observed were: photosynthetic pigment content, plant height, shoot fresh weight, shoot dry weight, number of leaves, leaf area, root fresh weight, root dry weight, and root length, flowering age, panicle weight, fresh and dry weight seeds, and dry weight of 100 seeds. This research used completely randomized design (CRD) with one factor, the concentration of nanosilica with five dose treatments: 0 ml/L; 2.5 ml/L; 5 ml/L; 7.5 ml/L; 10 ml/L with 5 repetitions. The data were analyzed using Analysis of Variance (ANOVA) and continued with Duncan's Multiple Range Test (DMRT) at a confidence level of 95%. The results showed that applying nanosilica with a concentration of 2.5 ml/L increased the chlorophyll a content by 119%, total chlorophyll by 64%, plant height by 32%, fresh shoot weight by 38%, shoot dry weight by 63%, area leaves by 33% compared to control. However, application of nanosilica had no effect on the number of leaves, root wet weight, root dry weight, panicle weight, seed fresh weight, seed dry weight, and root dry weight. The conclusion of the research is that administering nanosilica at a dose of 2.5 ml/L to 10 ml/L increases vegetative growth, but does not affect generative growth. The optimum dose of nanosilica for vegetative growth is 2.5 ml/L, while the optimum dose for generative growth has not been found.

Keywords: Chlorophyll test, canopy growth, root growth, panicle growth