

Abstract:

To compare the effects of titanium dioxide nanoparticles normal and sensitive to the color on the growth parameters of sorghum (*Sorghum bicolor*), Experiment in a greenhouse Educational Research Faculty of Agriculture, University of Zabol in 1393 in factorial randomized complete block design with 3 replications. The first method is applied for the project as a factor of 3 levels and use of both types of nanoparticles as a second factor of 11 levels (0, 1, 10, 50, 100, and 500 ppm of nanoparticles and 0, 1, 10, 50, 100, and 500 ppm for color-sensitive nanoparticles) were used. Based on the results, it was found that the nanoparticles play a role in growth compared to the control sample (dry weight and shoot fresh weight and height) and leaf chlorophyll content (a, b, total and Carotenoids), the rate of nutrient uptake sorghum stalks and also has antioxidant activity, so that a significant effect (at the level of one percent) of all parameters have been studied. The overall effect of nanoparticles on quantitative indicators, chlorophyll content, nutrient shoots concentration and antioxidant activity of sorghum was positive. It must be said that the use of three methods of soil application, seed and foliar infection, the effect of conventional nanoparticles and dye sensitized on quantitative indicators, chlorophyll content, nutrient shoots concentration and antioxidant activity was observed. The highest level of quantitative and qualitative indicators of the plant by applying the dye-sensitized nanoparticles are obtained, and this shows the superiority of the nanoparticles.

Keywords: nanoparticles, sorghum, titanium dioxide, performance, micronutrients



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Comparison of the Effect of TiO_2 and Dye-sensitized TiO_2 Nanoparticles on the Growth Parameters of Sorghum (*Sorghum bicolor*)

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