

Abstract

Given the importance of cumin and optimized with regard to the impact of plant nutrition and the effects of different amounts of iron and humic acid sprayed in ensuring the proper functioning of Planning and nanoscience field to examine the effects of humic acid chelated iron quantitative and qualitative characteristics cumin (*Cuminum cyminum*) is a factorial randomized complete block design with three replications in crop year 1392 at the Institute of Agriculture (well half) was conducted. The first factor involves spraying with humic acid on two levels: 1) control, 2) 3 liters per hectare and the second factor foliar iron fertilizer levels (normal and nano-iron) in seven levels which are: 1) lack of Fertilizers 2) 4/1 liters per hectare Fe 3) 8.2 liters per hectare Fe 4), 6.5 liters per hectare Fe 5) 1 kg ha nano-iron 6) 2 kg per ha Nano Kalat Iron 7) 4 kg ha nano iron chelate. Data analysis showed that the humic acid sprayed once before flowering, plant height, shoot dry weight, yield, photosynthetic pigment concentrations increased significantly, in addition to the yield of essential oil was also added. Lead 12, 6, 4, 17.2, 14% yield, fresh weight, dry weight, chlorophyll, essential oil, essential oil yield in terms of 3 liters of humic acid is a testimony to the claim. Micro and nano Fe fertilizer levels has a positive effect on plant height, shoot dry weight and essential oil content and the increasing concentration of photosynthetic pigments, compared with no fertilizer significantly increased grain yield. The parameters measured increases of 56, 43 and 47% oil yield, grain and total chlorophyll function using 4 kg of iron nanoparticles to improve this trait more than any other trait measured. The results showed that the quality of humic acid to 3 liters per hectare leads to increased 5 / 5, 12, 6 / 5, 5/2, 8/5 and 5 percent of the accumulation of nitrogen, phosphorus, potassium, iron, protein and carbohydrates the cumin seeds. Application of different concentrations of iron fertilization as well as improved quality traits considered typical nano (nitrogen, phosphorus, potassium, iron, protein and carbohydrates) was. However, this increase in the use of nano-iron treatment was more obvious. The increase for the accumulation of iron, phosphorus, carbohydrates of 3, 36 and 19% compared to control treatment. Interaction of humic acid and iron powder to improve the quantity and quality in the use of humic acid and iron has been Nanvklat. Essential oil, nitrogen accumulation, grain protein and carbohydrates in the application of 3 liters and 4 kg nano-iron humic acid respectively with 18, 31, 34 and 24 percent of non-use.

Keywords: Nano-iron, Iron, Humic acid, Cumi



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The thesis submitted for the degree
of master of science
(In the field of agronomy)

**Effects of humic acid and iron sources on qualitative and
quantitative characteristics of cumin (*Cuminum cyminum*)**

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September 2015