عنوان مقاله:

Magnetic fields and titanium dioxide nanoparticles promote saffron performance: A greenhouse experiment

محل انتشار:

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خلاصه مقاله:

Purpose: Plants are naturally influenced by magnetic fields. On the other hand, the application of titanium dioxide (TiO۲) nanoparticles may improve the quantitative and qualitative traits of plants. Research method: The effect of magnetic field and nano and bulk-TiO۲ was studied on the yield of saffron in Nishabur County, Iran. The treatments included ۵-mT magnetic field (at three levels of control, exerted magnet tapes into substrate, and the ۲۴-hour exposure of the corms to the magnets) and TiO۲ (at five levels of ۰ as control, ۱۰۰۰ and ۲۰۰۰ ppm nanosized-TiO۲, and ۱۰۰۰ and ۲۰۰۰ ppm bulk TiO۲). During the growing season petal fresh and dry weight, flower fresh weight, stigma dry weight and corm weight were recorded. Findings: The results showed that studied traits were significantly ($p < ۰.۰۱$) influenced by the magnetic field and nano-TiO۲. The highest stigma dry weight was related to the treatment of ۲۰۰۰ ppm nano-TiO۲ and ۴۸-hour exposure to the magnetic field, showing an insignificant difference with ۱۰۰۰ ppm nano-TiO۲. Application of TiO۲ nanoparticles in ۲۰۰۰ ppm increased stigma dry weight by ۱۴.۷ % and corm weight by ۵۱ % compared to the control. Exposure of corms to magnetic field in planting media and pretreatment with it, increased corm weight by ۱۳.۶ and ۲۶ % in comparing to control, respectively. Limitations: No limitations were founded. Originality/Value: According to the results, it is possible to use magnetic fields and TiO۲ nanoparticles to stimulate the growth of corms and flower of saffron.

کلمات کلیدی:

Corm, Physical treatment, stigma, TiO۲