

Effects of planting date and nano fertilizer on quantity and quality features of ornamental-medicinal Case Study: Gilan -Barehsar))

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Abstract The present study aimed to study quantitative and qualitative traits of saffron (*Crocus sativus* L.) as affected by complete nano fertilizer (CNF), carbon nanotube (CNT) and different planting dates in a factorial experiment based on a Randomized Complete Block Design with three replications in a farm located in Bareh Sar, Guilan Province, Iran in two growing seasons 2014-2015 and 2014-2015. The experimental treatments included CNTs (0 and 2 mg l⁻¹), CNF (0, 5, and 10 mg l⁻¹) and sowing date (August 15, August 26, and September 5). The estimated traits included the duration of flowering period, the number of flowers, the fresh and dry weight of stigma, , corm diameter, the number of leaves, total chlorophyll and lycopene, safranal, crocin, and picrocrocin. It was found that delayed sowing accompanied with the application of nano fertilizers promoted quantitative and qualitative traits so that in the first growing season, the application of 2 mg l⁻¹ CNT × 10 mg l⁻¹ CNF × September 5 sowing date resulted in the highest flower number (1.533), stigma fresh weight (0.051 mg), stigma dry weight (0.0236 mg), and corm diameter (29.53 mm). In the second growing season, 2 mg l⁻¹ CNT × 5 mg l⁻¹ CNF × September 5 sowing date was found to be the best for the duration of flowering period (14.66 days), flower number (4.033), stigma fresh weight (0.0486 mg), stigma dry weight (0.023 mg), and corn dry weight (8.530 g). The best treatment for safranal (7.22 mg L⁻¹), picrocrocin (13.76 mg L⁻¹) and stigma lycopene (5.76 µg g⁻¹ F.W) was 2 mg l⁻¹ CNT × 5 mg l⁻¹ CNF × September 5 sowing date. The highest crocin was obtained under 2 mg l⁻¹ CNT × 10 mg l⁻¹ CNF × August 26 sowing date (13%) and 2 mg l⁻¹ CNT × 5 mg l⁻¹ CNF × September 5 sowing date (12.81%). The treatment of 2 mg l⁻¹ CNT × 5 mg l⁻¹ CNF × August 15 sowing date increased total chlorophyll significantly as compared to other treatments and was found to be the best

treatment for this trait. The treatment of 0 mg l-1 CNT × 0 mg l-1 CNF × August 15 sowing date was not suitable for most studied traits and was related to the lowest amount of most of them. In total, it can be said that the quantitative and qualitative yield of saffron was improved by the application of nano fertilizers - through making the optimum nutrients available - and the planting of roots in August-September - through making the optimum moisture and temperature available.

Keywords : Keywords: Safranal, Crocin, Picrocrocine, Vegetative traits, Saffron, Nanotechnology.

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