



Increasing Water Use Efficiency in Saffron (*Crocus sativus* L.) Cultivation



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Abstract

There was a trend of decreasing quantity characteristics because of a reduction of soil moisture content. For increasing saffron stigma yield three irrigations + one irrigation in mid summer is optimum. For increasing the amount of picrocrocin, crocin and safranal a moisture stress is desirable. Actually, efforts are necessary to increase water use efficiency (WUE) in saffron with respect to the actual used 3000 m³/ha water for an economical yield. Such a WUE optimization is especially necessary because of recent drought years in the main areas of saffron cultivation in the great Khorasan. The results of this experiment showed that moisture stress as much as 70% FC can be recommended for both saffron quantity and quality.

Keywords: Quality factors, saffron covering, stigma.

❖ Introduction:

Saffron (*Crocus sativus* L.) is adapted to arid and semi arid lands of Iran. Saffron is a low requirement water crop. Saffron is among few crops that is very important as an export non-oil product. It has a vital role in providing income and job creation. Saffron is the most important agricultural product of provinces Khorasan-Razavi and South Khorasan (Hosseini et al. 2003). Afghanistan, Greece, Morocco, Kashmir, Spain and Italy are other producers of saffron with negligible amounts. Iran as home of saffron has always been the first rank for cultivation area with an increasing trend and total production. According to statistics of 2017 produced saffron of Iran was 336 t that is accounted for about 88.8% of saffron world production. At present, cultivation area is about 105000 ha (MJA, 2017).

❖ Materials and methods:

This research was as Randomized complete block design (RCBD) with five treatments and four replicates. Treatments were as follows: 70% field capacity (FC) means based on weight moisture equal to 11.2% moisture with irrigation interval every 6 days, 60% FC means based on weight moisture equal to 9.6% moisture with irrigation interval every 15 days, 50% FC means weight moisture equal to 8% moisture with irrigation interval every 25 days, first control (C1) based on traditional method means four irrigations in times of early fall to facilitate flowering, post picking up flowers, in mid winter, and at the end of growing season (early May), and the second control (C2) that in addition to the above traditional method one irrigation in early August (mid summer).

❖ Results and discussion:

Results obtained based on a two year average showed that there was no significant effect for quantitative factors as mean comparisons but it had significant effects on quality factors (Figure).

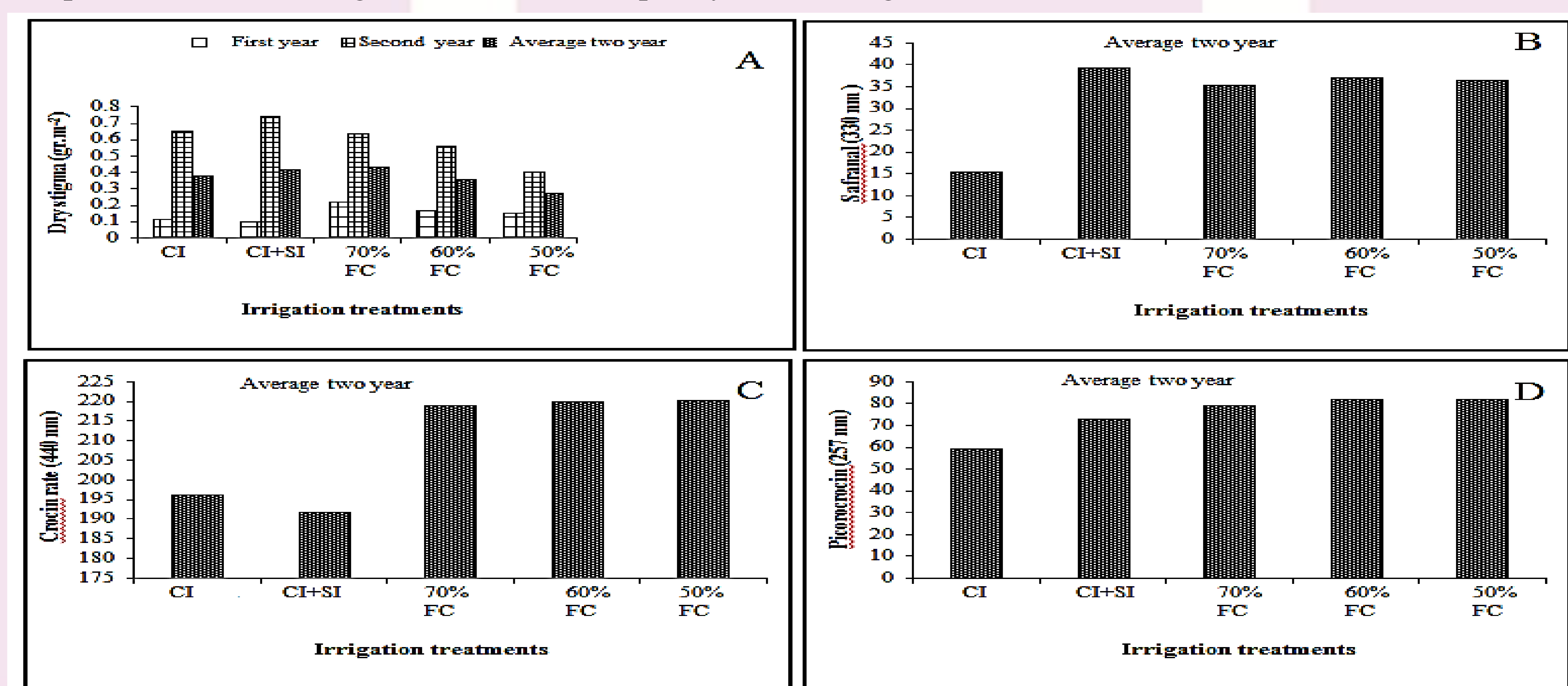


Figure: CI:conventional irrigation(four times irrigation in respective phenological stages of saffron as traditional method.CI+SI:conventional irrigation plus one irrigation in mid summer. A.Effects of irrigation treatments on dry stigma.B.Effects of irrigation treatments on safranal content.C.Effects of irrigation treatments on crocin content and D.Effects of irrigation treatments on picrocrocin content.

❖ Conclusion:

The results showed that moisture stress as much as 70% field capacity (FC) can be recommended for both saffron quantity and quality aspects.

❖ References:

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