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Short Comminucation

Crop water requirement of saffron (*Crocus sativus)* in Kashmir valley

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Saffron (*Crocus* sativus L.) is a perennial, herbaceous plant and a member of Iridaceae family that has been cultivated for its spice. The dried stigma of this plant composes the most expensive spice in the world. It is an important cash crop of Jammu and Kashmir State. Saffronis cultivated by farming population of Kashmir and has a significant contribution to the overall economy of the state. Saffron is considered to be a suitable crop for areas with low rainfall with limited water supply (Azizi-Zohan *et al*., 2004). These conditions necessitate the understanding the water requirement of the crop. Crop evapotranspiration is used to calculate the crop water requirements. Reference evapotranspiration concept has been applied to estimate the crop water requirement of some major crops in Kashmir Valley namely paddy, wheat, maize, pulses and apple (Ahmad *et al*., 2017 a & b).

Pampore known as "Saffron town of Kashmir" is located at 34°01' N and 74°56' E and has an average elevation of 1574 m amsl. Saffron is grown on uplands known as "Karewas". The annual average maximum temperature of the region is 18.1 °C and the annual average minimum temperature of the region is 6.5 °C. The weather data for the area was obtained from Regional Meteorological Centre Srinagar. The data set consisted of daily values of maximum temperature, minimum temperature, morning relative humidity, afternoon relative humidity, sunshine hour and wind speed for the period of 1992-2016. In the present study, the crop water requirement of saffron at different stages of crop for Pampore area of Kashmir Valley was determined.

The reference evapotranspiration (ETo) was estimated using FAO-56 Penman-Monteith method as mentioned by Allen *et al.,*(1998). The values of crop coefficient (kc) during different growth stages viz. initial stage (0.22 – 0.24), mid stage (0.94 - 1.05) and late-season stage (0.68 – 0.78) as specified by Azizi-Zohan *et al.,*(2008) were used to calculate crop water requirement (ETc).

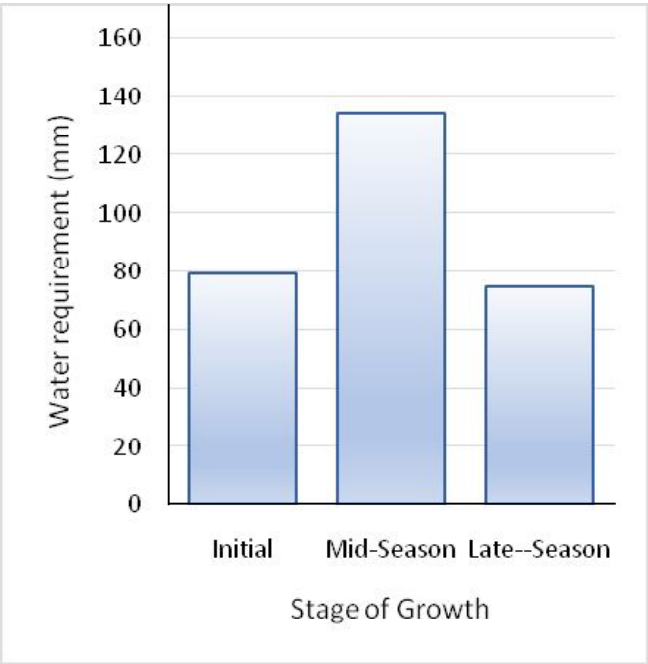

Fig. 1: Water requirement (mm) of saffron for different stages of growth

$$ETc = ETo \times Kc$$

The total water requirement for the saffron crop was found to be 288 mm. The water requirement was 80 mm during the initial stage (sprouting to flowering). This is due to low canopy cover of the crop during this stage. The water requirement increases with the advance of vegetative stage (Fig. 1), with crop development, per cent increase ground cover, leaf area and crop height.The water requirement was 134 mm during the mid-season stage (vegetative growth period). This comprised nearly 46% of the total water requirement of the crop. The water requirement again depleted with the decrease in canopy cover during the late season stage. In this stage, the leaves and roots begin to dry and finally the corms enter dormancy. The water requirement during this stage was found to be 75 mm. Similar findings were reported by Yarami *et al.,* (2011) for water requirement of saffron for Iran.

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