



International Conference

Saffron and Seed Spices - Innovative Technologies for Sustainable Development

7-8 November, 2021



THEME – A

**Climate Resilience in Spice Crops Production
and Mitigating Climate Change**

Reduction of Soil Temperature during Saffron Flower Initiation Stage by Organic Mulches Application as a Strategy for Climate Change Adaptability

H. R. Fallahi¹, S. M. Moghadam², M. A. Behdani³ and S. Mahmoodi³

¹Plant and Environmental Stresses Research Group, University of Birjand, Birjand,, Iran

² Graduated in Crop Ecology, Faculty of Agriculture, University of Birjand, Birjand,, Iran

³Saffron Research Group, University of Birjand, Birjand,, Iran

The first stage of saffron flowering which is called flower initiation and happens during mid-summer is very sensitive to high temperatures. Optimal temperature for this stage is ~ 25°C, while temperatures above 30 °C causes abortion of some flowers. Over the past decades, along with increasing temperature, saffron has more exposed to heat stress during flower initiation. It has been suggested that application of plant residues as organic mulch can improve flowering by reducing soil temperature during saffron flower initiation. However, the effect of mulches on soil temperature was not studied practically so far and we aimed to study it. For this purpose a field experiment was carried out during 2019 in Qaen (33°N, 59°E, 1440 msl), Iran, with two treatments (mulch application and control), each in three replications. Corm planting was done in late spring using corms with ~14 g weight and with a density of 220 corm per m² in plots with 6 m² area. Wheat residue (8 t ha⁻¹) was used as mulch immediately after corm planting. Air and soil temperatures were measured daily from 6th to 20th, August, 2019, that is the approximate time for flower initiation. Moreover, flowers were harvested during flowering season in autumn and then the flower yield was determined. Results showed that soil temperature (at corm bed) was lower than air temperature. In addition, application of wheat residue as mulch reduced considerably soil temperature compared with the control (no-mulch). Accordingly, flower yield also expected to improve in this treatment, which this hypothesis was not confirmed. The reason of this observation is not clear for us, and therefore more research needs to be done. However, it seems that mulch application may be more effective in warmer climates.