

AN OVERVIEW OF BIOTIC IMPACT ON SAFFRON CULTIVATION IN KASHMIR.

¹GH. NABI JOO AND ² SYED MUZAFFER AHMAD

¹ Associate Professor (Botany) A S College, Srinagar Kashmir(J&K)

E mail: ghulamnabijoo@gmail.com

² Associate Professor (Chemistry) A S College, Srinagar Kashmir(J&K)

E mail: syedmuzafar05@gmail.com

ABSTRACT:

Kashmir saffron a highly prized spice known all over the world for its panacea properties, is dying a slow death. . The present compilation attempts to visualize the influence of various types of biotic interferences on this golden spice and how the interference has affected the livelihood of the people directly or indirectly connected with cultivation or trade of this golden spice. Thousands of families cultivate it as a family profession for their decent livelihood. A preview of cultivated area, production and productivity for the last decade and half shows that this golden crop is dwindling at a fast rate. Further the continued impassivity and various challenges may result in the loss of this delicacy, due to a created damaged atmosphere.

Key words: Biotic interference, Saffron (*Crocus sativus L.*), Challenges, Cultivation., Production.

INTRODUCTION:

Saffron valued as a medicinal perennial herb and a dye has been prized, the world's most expensive spice since times immemorial. Saffron finds its mention as far back as 1500 BC in many classical writings as well as in the Bible. The Kashmiri ancient Hindu epic, Nilmat Purana also mentions about the Saffron cultivation in Kashmir. .In Kashmir, it is the legendary crop acclimatized to hillsides, plateaus (locally called karewas) in altitudes between 1500 to 2400 metres. Saffron requires a well drained loamy soil with neutral to slightly alkaline reactions and is well adapted to areas with cold, rainy winters and warm dry summers. Saffron (*Crocus sativus L.*) is a perennial, herbaceous, 10 to 25 cm high cormous plant, belonging to family Iridaceae. The outstanding feature of saffron flower is three pronged style with each prong terminating into a vivid 25—30 mm long scarlet stigma drooping over perianth lobes 6 in number. Currently over sixteen thousand families spread over 226 villages are engaged in saffron farming, not only for decent livelihood but as a family profession as well. From the last two decades a continued decrease in the yield of this golden spice has been observed on account of continued decrease in the cultivated area with a simultaneous decrease in the production and productivity per hectare of land. The official data reveals that before 1985 saffron was cultivated on 5800 hectares of land in J&K, now the area under cultivation has reduced from 5,707 hectares in 1996 to 3,715 hectares in 2009—10 and presently it is confined to 3,674 hectares only (Zahid M. 2016) . Further a survey of saffron industry conducted by Sher-i-Kashmir University of Agricultural Science and Technology (SKUAST-K) In 2010 found that yield has gone down from the intended target of 4.5 kg per hectare to less than 2 kg per hectare. The incessant greed on the part of merchandise and adulteration has damaged the prized spice so much that its death seems to be imminent.

AREA AND PRODUCTION:

Almost 96 to 98% of saffron in J&K is grown in Kashmir valley and 2 to 4% of it being grown in Kishtawar district of Jammu region. During the last decade and half the total area under saffron cultivation has been reduced by 25% while the production and productivity also receded significantly. As per the data available from the State Financial Commissioner, Srinagar (J&K) the total area under saffron cultivation in the year 1997 was 5361 hectares, production was recorded at 17.37 metric tonnes and productivity was estimated at 3.24 Kg per hectare. However in the year 2009 the total area under saffron was 3675 hectares, the production was 9.18 metric tonnes, while productivity was recorded at 2.50 kg per hectare (Economic survey 2010---2011 J &K). Keeping 1997 as the bench mark, the percentage change during the aforesaid period reveals that area has receded to 31%, the production level reduced to 47% while the productivity has declined to about 23%. The production data during this period is depicted in the following table.1

Year	Area under cultivation (In hectares)	Production (In metric tonnes)	Productivity (Kg/hectare)
1997	5361	17.37	3.24
1998	4194	N A	N A
2002	2880	5.154	1.88
2003	2742	6.525	2.27
2004	3075	4.834	1.57
2005	2989	8.852	2.96
2006	2928	4.85	1.66
2007	2436	9.131	3.75
2008	3110	4.721	1.63
2009	3675	9.188	2.50

Table 1: Saffron productivity during the last decade (Reyaz Malik, 2009).

*(No survey was conducted during the period 1998 to 2001).

BIOTIC IMPACT:

Due the continued decreasing trends in the yield of this golden crop, saffron growers are no longer motivated in investing their money and time in the industry when they fear that outcome would not match their hard toil in the fields. The prime biotic factors for the imminent death of this heritage cash crop are:

1. With growing urbanisation in Pampore and its adjoining hamlets figures 2 and 3 (e.g. Zaffron colony at Sempora, Tulbagh area of Pampore, although in violation of Environmental protection Act) and a shift from joint to nuclear type family pattern, the saffron industry in Kashmir is facing a great threat as Government has failed to curb constructions on the saffron land and put standing laws into practice. Further the activity of land grabbing and digging of karewas for landfills has drastically reduced the land available for saffron cultivation (fig.4&5). The excavation sites latter get transformed into ditches thus abandoning the land for saffron cultivation.



Fig. 2



Fig. 3

Urbanisation of saffron land (fig 2&fig3).



Fig. 4



Fig. 5

Figures (4 and 5) depicting illegal excavation sites of saffron land.

2. A number of new big and small scale industrial units e.g. cement factories, lime stone crushers have come up in the adjoining areas of Pampore green belt since 1990 (Yawar Ali,

2006) emanating smoke and dust particles. The smoke and dust particles stagnate for longer periods in the local atmosphere, cause a heating affect on the lower stratospheric layers and result in less rainfall in the area due to larger amounts of warmer gases in the exudates. (Action Aids Investigations). The dust and other noxious pollutants from these industrial units also get deposited in the upper crust of soil, change chemistry and composition of the soil, affect photosynthesis and other vital processes of plant life leading to a silent death of the plant. What remains left are barren, undig and undressed areas of arable saffron land (fig. 4&5).

3. The dry spell and erratic precipitation during the peak periods of rejuvenation and harvesting in the last few years have forced many saffron growers to either sell or abandon their land as they cannot afford to incur expenditure on digging and dressing of saffron beds twice a year. In the absence of any proper irrigation facility during the peak periods the production is greatly reduced.

4. The excessive and profuse growth of weeds like ; *Tulipa stellata*, *Erodium cicutarium*, *Lithospermum arvensis* , *Aegilops tauschii*, *Salvia moorcroftiana*, *Thymus serphyllum*, *Poa bulbosa*, *Centaurea iberica*, *Lespedza juncea*, *Lycopsis orientalis*, *Galium asperifolium*, *Euphorbia helioscopia*, *Astragalus camus*, *Cynodon dactylon*, *Cyperus rotundus*, *Tulipa lanata* Rgi. *Verbascum thapsus* L, *Tribulus terrestris* L, *Trifolium repens* L.etc. often deprive the soil of its mineral nutrition, moisture content which in turn influences the recapitulation and overall saffron production and productivity. The infested weeds compete for light, space and minerals thereby limiting the quantitative and qualitative yields of saffron. The absence of deweeding during the growth season and lack of proper irrigation facilities also aggravates the problem.

5. A big historical problem which still continues unsolved is adulteration. Being an extremely valuable spice, saffron has been and continues to be adulterated to get maximum benefit. Saffron is being adulterated by using plants such as safflower (*Carthamus tinctorius*), *Hamerocallus fulva*, *Crocus vernus*, *Calendula* species , roots from *Allium* species, root hairs from *Salix* species, coloured gelatine fibres etc. The extreme greed on the part of merchandise has deteriorated the commercial trade of this prized spice with saffron growers being the worst sufferers.

6. Another factor is the Hindustan Petroleum Corporation Limited (HPCL) plant and the gas turbines in the heart of Pampore town that released harmful gases polluting saffron land and local atmosphere. The incoming and outgoing transmission lines of 150 * 3 M VA , 220 / 132 M V Grid station transformed the Sona Krend (gold yielding) area of saffron land into a death trap, forcing the farmers to abandon saffron land thereby leading to decreased yields(Sheikh Jaleel, 2012).

DISCUSSION:

For the continued trends of decreased yield and productivity of saffron, the prime factor is the growing urbanisation in the Pampore belt (saffron bowl) as the land used for saffron cultivation is being increasingly used for construction of buildings both residential and

commercial. From 7000 hectares in Pampore tehsil the land under saffron cultivation has reduced to 3600 hectares, while few years before one hectare would yield around 10 kg of saffron, at present only around 2 kg per hectare are produced (Sheikh Jaleel, 2012). A number of soil excavation sites are visible at Chandhara, Samboora, Wuyan etc. where saffron soil is vandalised during broad day light for different projects without thinking of ecological consequences.

The ever increasing number of cement plants and lime stone mines coming up in Khanmoh-Khrew-Ladhu area, in violation of Environment Protection Act (Courtesy State Pollution Control Board) tonnes of noxious pollutants are being added to local atmosphere daily. The authorities of State Pollution Control Board (SPCB) should implement rules and regulations to save fauna and flora of the area before permitting setting up any cement factory and lime stone mines. The presence of tree cover in the mountains and strip plantations in the area would have offset the excess carbon dioxide content in the area.

Concerned over the declining trends of saffron production in Kashmir, Government of India approved a flagship programme for revival of saffron through “ National Saffron Mission” in the year 2010—2011, to improve the overall production and productivity per hectare of the saffron. The National Saffron Mission would have revolutionized the saffron industry but the ineptitude of the officialdom and indolence on the part of saffron growers damaged the purpose for which National Saffron Mission was introduced. Official statistical data of the saffron production after 2010—2011 present a bleak picture of the mission. In the year 2010—2011 when the project was launched, the production was 11.5 metric tonnes and five years later in 2015—2016 after implementation of saffron mission, production stands as 9.6 metric tonnes (Zahid M. 2016).

CONCLUSION:

Presently the most important challenge is the low productivity, adulteration of saffron coupled with unorganised marketing, pre and post harvest management practices, urbanisation of saffron belt and crop diversification (Malik, 2012). The need of the hour is that Government should take every possible step to nurture the saffron industry by banning the sale and use of saffron land for any construction purposes. Further a complete ban on the establishment of any cement factory and lime stone mines in violation of Environment Protection Act needs to be discouraged and banned in the saffron belt. In J&K even the crop can be proliferated to non traditional areas of the valley due to favourable climatic conditions. The research (SKAUST-K) conducted so far reveals a tremendous scope for rejuvenation of saffron thereby increasing production and productivity by threshold levels. The current scenario demands to gear up and strengthen the farmers oriented and technology driven research approach by Sher-i-Kashmir University of Agriculture Sciences and Technology Kashmir (SKUAST - K) and Central Institute of Tropical Horticulture (CITH) to save the prestigious heritage. In the mad race to earn more it is the beauty of saffron that becomes the first causality.

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