

A Case Study :

Improved technology of saffron (*Crocus sativus* L.) cultivation in Kashmir

AJAZ AHMAD SHAH AND RAJ BAHADUR TRIPATHI

Accepted : October, 2008

Saffron is an important cash crop of Jammu and Kashmir State. Saffron is cultivated by farming communities of Kashmir, contributing significantly overall economy of the state. The productivity of saffron in the state is very low about 2 kilograms per hectare as compared to other saffron growing countries. The sustainability in saffron crop is the most vital aspect to improve the status of the crop and the economy of the saffron growers. Despite the fact that saffron growers can be effectively exploited, the growers often met with poor management of saffron crop which does not allow them to increase the productivity. Saffron growers require technical assistance in scientific cultivation, sprinkle irrigation methods, and manure / fertilizer management practices. They need scientific as well as economic assistance to adopt the recommended technologies. Improved technology regarding cultivation is the need of the day, so as to increase the productivity of saffron.

Saffron (*Crocus sativus* L) is a bulbous perennial herbaceous plant treasured for its golden coloured, pungent stigmas, which are dried and commercially important for its medicinal, flavouring, colouring and perfumery properties. Saffron is propagated vegetatively through its corms. Saffron corms are globular, 2 to 5 cm in diameter and produce radical, thread like dark green leaves surrounded in the lower region by 4 or 5 scales at the base. The perianth is mauve coloured forming a cylindrical tube 7 to 8 cm long. The three stigmas along with style constitute in the dry state, the pure saffron for commercial importance.

Saffron is cultivated in Spain, Italy, Iran, Greece and India. In India, the

dominant saffron cultivation activities has been taken extensively only in district Pulwama of south Kashmir spreading over an area of 2.5 thousand hectares. The productivity of saffron in the state is very low about 2 kilograms per hectare as compared to other saffron growing countries like Italy (10 kg / h), Spain (8 kg / h) and Iran (5 kg / h).

The reasons for low productivity in the state is poor management of saffron cultivation, as it involves specialized operations from selection of land, planting techniques of corms, application of fertilizers and manures, intercultural operations, sprinkle irrigation, picking, sorting and drying. Its cultivation is highly labour intensive. We can not expect that that all the technologies generated by research system would reach all the saffron growers, even with the functioning of well established development departments engaged in the transfer of such technologies. Though it is a cash crop, saffron growers do not get the potential yield since they are not fully aware of scientific technologies, do not possess the technical skill, expected knowledge and convinced to adopt the improved technologies in their fields. It is worth to study the improved technology of saffron cultivation in Kashmir, so that those who are concerned, with saffron like researchers, development workers, policy makers, planners etc can appropriately work for the development of saffron growers, by minimizing the gap between poor management of saffron cultivation that prevails at present.

Improved technology :

Soil and climate :

Sandy loam to loamy soils rich in well decomposed organic matter is very ideal for saffron cultivation. Its cultivation is

See end of the article for authors' affiliations

Correspondence to:

AJAZ AHMAD SHAH
Department of Agricultural
Extension, Amar Singh
College, Lakhaoti,
BULANDSHAHR
(U.P.) INDIA

Key words : Saffron, *Crocus*, Technology, Cultivation, Kashmir.

Table 1: Area, production and productivity of saffron (1997-2006)

Year	Area (ha)	Production (Tonne)	Productivity / ha
1997	5361	17.4	3.24
1998	4164	13.0	3.13
1999	4042	7.8	1.92
2000	2831	3.6	1.26
2001	2758	3.0	0.10
2002	2880	6.6	2.26
2003	2742	5.2	1.88
2004	3063	4.9	1.57
2005	2989	8.9	2.96
2006	2928	4.9	1.65

Source: State Financial Commissioner, Srinagar (Kashmir)

successful in sub-temperate to dry temperate climates. Saffron requires a mean temperature of 6 – 8° C at night and 15 – 20° C during day times in the months of October and November provide a very pleasant climate for better blooming (Molina *et al.*, 2005). Spring rains are favourable for corm multiplication an early autumn rains boost flower production.

Land preparation :

Plough land 3 – 5 times to a depth of about 30 cm in the month's of May to July. Well decomposed FYM, 15 to 20 tonne is sufficient for an area of one hectare of land, to keep the soil in loose form and it helps in rapid corm multiplication. Full dose of FYM, P₂O₅, K₂O and 1/4th dose of Nitrogen should be applied as top dressing at an interval of 12 – 15 days. In the month of August, during intercultural practices the above doses of manure and fertilizers should be applied in subsequent years.

Planting techniques of corms :

Planting of corms is done from August to middle of September; they should be planted in 2m × 3m strips with 15 cm deep and 30 cm wide drainage channels around each strip. A spacing of 10 – 15 cm between rows with a depth of 10 – 12 cm may be adopted. In an area of one hectare five lakh (30 – 40 quintals) healthy and disease free corms of about 3.5 cm diameter are used. The seed corms should be treated with 5 % copper sulphate before planting.

Propagation of corms :

Saffron is a perennial crop and is propagated through its corms. Each mother corm produces 2 to 12 cormlets annually. New corms keep developing each year to replace

older ones. The bigger sized corms formed in a year produce flowers during the following season. The corms remain dormant from May to August (Aga *et al.*, 2006).

Fertilizer / manorial requirements :

Well decomposed FYM or compost @ 15 – 20 tonne per hectare is suitable in the month of July – August at the time of land preparation. Besides this, 50 kg Phosphorus and 50 kg Potash is recommended as basal dose whereas, 40 kg Nitrogen is applied in two equal split doses, the first dose (20 kg) at the main hoeing and the remaining in third week of November (Munshi, 1994).

Intercultural operations :

The corms planted in July and August should not be disturbed till November in the first year of planting. However, one light hoeing in November is helpful for removal of weeds and restoration of aeration in the soil. In subsequent years, second hoeing and weeding is done in May – June. This facilitates necessary aeration in the soil and is very helpful for development of corms. A deep hoeing (8 – 10 cm) should be given in August *i.e.* about a month earlier to flowering also a light hoeing to a depth of 4 – 6 cm should be done in early September before the flowers appear (Aga *et al.*, 2006). Thus, 3 – 4 hoeing / intercultural operations are required for raising a better production of corms and flowers.

Irrigation frequency :

Saffron is grown as a rain-fed crop. In absence of summer rains the crop should be adequately irrigated through sprinkle at 15 days interval during the months of August – September. Sprinkle irrigation application seems to be a suitable measure in increasing this efficiency. It will ensure large size corms which are effective in flowering (Zehan *et al.*, 2006).

Harvesting and processing :

The picking of saffron flowers starts in the first week of October and may continue till 15th November. The saffron flowers are picked manually in the morning hours after the evaporation of dew. 3 - 5 rounds of plucking are done for annual harvesting. The flowers contain style with its three stigmas are separated from the flowers. The separated stigmas should be dried in specially designed solar driers. The dried saffron contains about 10 % moisture should be stored for suitable packing and marketing.

Yield :

Scientifically managed crop has the potential to yield

about 5 kg per hectare of dried saffron. The yields in the first year of its plantation are low and which increase significantly in the succeeding years.

Authors' affiliations:

RAJ BAHADUR TRIPATHI, Department of Agricultural Extension, Amar Singh College, Lakhaoti, BULANDESHAH (U.P.) INDIA

REFERENCES

Aga, F.A., Wani, G.M., Hassan, B. and Wani, M.A. (2006). Cultivating saffron scientifically in Kashmir. *Indian Horticulture*, **51** (1) : 21 – 24

Molina, R.V., Valero, M., Navarro, Y., Guardiola, J.L. and Garcia, L.A. (2005). Temperature effects on flower formation in saffron (*Crocus sativus* L). *Scientia Horticulturae*, **103** (3) : 361 – 379

Munshi, A.M. (1994). Effect of N, P and K on the floral yield and corm production in saffron (*Crocus sativus* L) under rain fed conditions. *Indian Cocoa Arecanut and Spices J.*, **18** (2) : 41 – 44

Zehan, A. A. A., Kamgar Haghghi, A.A., Sepaskhah, A.R. (2006). Effect of irrigation method and frequency on corm and saffron production (*Crocus sativus* L). *J. Sci. and Tech. Agri. and Natural Resources*, **10** (1) : 45 – 54
