Short Research Article

Knowledge Level of Saffron Growers in Ghorian District of Heart in Afghanistan

Abdullah Faiz[1*], Mahbob Shah Sultani[2] and Abdul Sattar Fazely[3]

[1]Dept. of Agricultural Extension [2]Dept. of Plant Protection [3]Dept. of Agricultural Extension, Faculty of Agriculture, Herat University, Afghanistan

Abstract

Saffron (*Crocus sativus* L.) is the most precious and expensive spice in the world. It is one of the important commercial crops in Afghanistan. Several historical testimonies, dated around 2,000 years ago, mention that saffron was cultivated in Afghanistan. Since the saffron re-cultivation and introduction started by 2002, the farmer's knowledge on package of practices remain conspicuous. The present study was conducted in Ghorian district of Herat province in Afghanistan during September 2012 to assess the knowledge level of the saffron growers regarding recommended cultivation practices. A total of 120 saffron farmers from Posht-e-Hesar and Bazarcha were interviewed using a pre-tested schedule. The over-all knowledge level of farmers varied significantly. About 66% of saffron growers had medium, 21.5% high and 12.5% low level of knowledge of recommended practices. Among the 120 farmers interviewed, 95.8-98.3% had correct knowledge on duration of the recommended corm, corm rate, fungi control, suitable month for sowing, number of stigma in each flower, appropriate weight for corm, recommended corm, earthing-up , crust-breaking after planting and annually. Age, education, land holding and mass media participation of saffron growers had a positive and significant relationship with knowledge level. Hence, a series of educational activities should be undertaken by the agencies which focus on the good agricultural practices to improve the knowledge level of farmers.

1. Introduction

Saffron (*Crocus sativus* L.) is one of the oldest natural plants which have attracted the world by its significant characteristics such as color, taste and aroma. It is the most expensive spice and medicinal plant in the world. However, it is one of the important commercial crops in Afghanistan. There are different theories relating to the origin of saffron. Several historical testimonies dated around 2,000 years ago mention that saffron was available in Afghanistan. More recently, there are records that around 80 years ago some farmers re-started growing this crop in Herat province (Hashim, 2007). The plant grows to a height of 20-30 cm (8-12 in), and sprouts 5-11 white and non-photosynthetic leaves in a fine structure that covers and protects the crocus's 5-11 true leaves as they develop. The latter are thin, straight, and blade-like green foliage leaves, which are 1-3 mm in diameter, either expand after the flowers have opened (*hysteranthous*) or do so simultaneously with their blooming (*synanthous*). Its flower-bearing structures bear specialized leaves that sprout from the flower stems; the latter aestivating in spring, the plant sends up its true leaves,

each up to 40 cm (16 in) in length. In autumn, purple buds appear. Only in October, after most other flowering plants have released their seeds, do its brilliantly hued flowers develop; they range from a light pastel shade of lilac to a darker and more striated mauve. The flowers possess a sweet, honey-like fragrance. Upon flowering, plants average less than 30 cm (12 in) in height. A three-pronged style emerges from each flower. Each prong terminates with a vivid crimson stigma 25-30 mm (0.98-1.2 in) in length. The flower has three stigmas and these are often collected and dried to make the saffron spice. Water, which is most important for any agricultural activity and is usually a limited resource, however, is not in the case of saffron. It requires the least amount of water and would never face a problem in areas with limited water resources. It has been tested that in cold winter or warm summer this plant does not have any particular disease and does not need urea. Further, it is regularly cultivated in more than seven provinces with a total area of around 250 ha involving approximately 1,300 farmers. Approximately 67,500 work-days have been created, and around 3,000 kg of saffron is the estimate for the current year with a value of around $ 3.9 million, calculated

according to an average price of $ 1300 kg^{-1} (in addition to annual 1,406.25 MT of livestock fodder produced as a by-product) (Wyeth, 2007). In 1973, the Afghanistan Government implemented a saffron trial planting in Ordokhan farm of Herat. However, the results of the production trials are not available anymore. After the return of refugees from Iran to Afghanistan in 1991, some who had worked in saffron fields in Iran brought back with them saffron corms, also referred to as bulbs or onions, and on their return planted saffron in Ghorian district of Herat province. As a result of Danish Committee for Aid to Afghan Refugees' (DACAAR) positive experiences with saffron up to 2002, the Ministry of Agriculture, Government of Afghanistan and some other NGOs began to distribute saffron corms to farmers and other saffron growers in the provinces of Herat, Mazar-e-Sharif, Baghlan, Kandahar, Ghazni, Helmand, Logar, and others. The productivity and production of the saffron crop is mainly depended on the saffron growers' adoption level. Therefore, the study was undertaken to understand the knowledge level of saffron growers with respect to scientific recommended of saffron cultivation practices.

2. Materials and Methods

The study was conducted in Ghorian district of Herat province in Afghanistan in the month of September 2012. The Ghorian district has maximum area under saffron crop among 15 districts of Herat province. A list of saffron growers with their villages were prepared for selecting of study area. Among the enlisted saffron growers 60 were randomly selected using simple random sampling technique. Thus, the total sample size for this study constituted 120 respondents from Posht-e-Hesar and Bazarcha village. Data collection was done by personal interview method with the help of the well-structured schedule. The statistical tools such as frequency, percentage, mean and Chi-square (X^2) was used to analyze the data.

3. Results and Discussion

3.1. *Knowledge level of overall recommended cultivation practices*

Table 1 reveals that about 66% of saffron growers had medium knowledge while 21.5 and 12.5% had low and high knowledge, respectively. The results are due to the lack of exposure of farmers to the new practices that are developed in the district. Other reasons could be the low level of educational status in the study area, lack of extension contact and lack of conducting proper training by proper trainer. The farmers who had higher educational status possessed higher knowledge about the recommended cultivation practices of the saffron because of using of booklets and other publication. Comparing the level of knowledge of saffron growers between the two villages

Chi-square (X^2) test showed no significant difference indicating that the level of knowledge was not influenced or affected by the origin or place of birth of the growers. The findings were in conformity with the findings of Amir Qasimi (2004).

3.2. *Knowledge level of individual recommended cultivation practices*

Table 2 shows that 98.3% of the saffron growers had correct knowledge about the practices like seed rate per *Jerib*$^{-1}$ (2,000 m^2) and chemicals used for controlling rats. Further 97.5-95.5% of saffron growers had correct knowledge about the practices like appropriate weight of seed size corms, recommended shape of corms, recommended method of sowing, earthing-up, crust-breaking after planting and annually, and method of harvesting. More than 90% of the saffron growers had correct knowledge about practices like suitable month for sowing, row to row spacing, post-harvest practices, chemical used for seed treatment, appropriate time of harvesting and plant-to-plant spacing. More than 50% of saffron growers had correct knowledge about recommended farmyard manure, ridge height, irrigation potential, chemicals used to control pest and disease, urea dose and di-ammonium phosphate dose. Awareness could be attributed to the fact that saffron is considered a commercial crop with high potential returns to the farmers which might have motivated them to learn more about the crop cultivation technologies. Additionally, it could also be mentioned that the farmers in the study area are involved in cultivating the crop for quite a long time and their past experience in cultivating the crop must have also added to their present level of awareness. So 35.8% had correct knowledge of exact yield ha^{-1} and only 7% of had the ability to identify the pests or diseases attacking their farms while none among them knew anything about bio-control agents of pests and diseases. This indicates lack of awareness, extension contact, extension participation and mass media participation. Recently, many non-governmental organizations (NGOs) have made special efforts in educating

Table 1: Knowledge level with respect to the overall recommended saffron cultivation practices (n=120)

Category	Score	Posht-e-Hesar (n=60)		Bazarcha (n=60)		Overall districts (n=120)	
		Fre	Per	Fre	Per	Fre	Per
Low	<18	8	13	7	12	15	12.5
Medium	18-21	38	64	41	68	79	66.0
High	>21	14	23	12	20	26	21.5
Total		60	100	60	100	120	100

X^2=1.205 ns

Fre: Frequency; Per: Percentage

Table 2: Knowledge level of saffron grower farmers with respect to recommended saffron cultivation practices (n=120)

Sl. no.	Recommended cultivation practices	Knowledge level			
		Correct	Percentage	Incorrect	Percentage
1.	Exact yield ha^{-1}	43	35.8	77	64.2
2.	Post-harvest practices	112	93.3	8	6.7
3.	Method of harvesting	116	96.7	4	3.3
4.	Appropriate time of harvesting	111	92.2	9	7.5
5.	Chemicals used to control pest and disease	65	54.0	55	46
6.	Bio-control agents to control pest and disease	-	-	120	100
7.	Name of the pest or disease attacking the plant	8	7.0	112	93
8.	Earthing-up, crust-breaking after planting and annually	116	97.0	4	3.0
9.	Ridge height	101	84.0	19	16
10.	Irrigation potential	100	83.0	20	17
11.	Row to row spacing	112	93.0	8	7.0
12.	Plant to plant spacing	109	90.8	11	9.2
13.	Chemicals rat control	118	98.3	2	1.7
14.	Di-ammonium phosphate dose	62	52.0	58	48
15.	Urea dose	64	53.0	56	47
16.	Farmyard manure	107	89.0	13	11
17.	Seed rate *jerib*$^{-1}$ (2,000 m^2)		118	98.3	2
18.	Recommended method of sowing	115	95.8	5	4.2
19.	Suitable month for sowing	114	95.0	6	5.0
20.	Chemical used for seed treatment	111	92.5	9	7.5
21.	Recommended corm shape	115	96.0	5	4.0
22.	Appropriate weight of seed corms	117	97.5	3	2.5
23.	Number of pre-sowing plowing	108	90.0	12	10

*Multiple respondents are possible

the farmers on the importance of using bio-control agents in controlling pest and diseases on one side and on another side even the saffron growers have not established good contact with extension agency and not take part in extension activities carried out by the field extension functionaries. The findings were in conformity with the findings of Aslami (2007).

3.3. Correlation between characteristics of the respondents and their knowledge level

Table 3 shows that age, education, land holding and mass media participation of saffron growers were significantly related to their knowledge level at 5% probability level and other characters, viz., family size, annual income, extension contact, extension participation, social participation, economic motivation, and innovativeness were not related to their knowledge level. It was revealed in the statistical study that as the age, education and the land holding increased, the knowledge level was also increased. Hence, it is recommended that to increase the knowledge level of the farmers, it is advisable to promote education programs, trainings, etc. to increase the production level of the saffron in the province.

The results showed that more number of the respondents belonged to medium knowledge level which were in line with the findings of Dadkhah et al. (2003); Miri (2007). Age and education were found to be significant with regards to the knowledge level of the farmers about the cultivation practices of the saffron. Hence, to improve the knowledge level, a series of educational activities should be undertaken by the government and non-government agencies focusing on complex practices which could be made available to the farmers through demonstrations.

Table 3: Correlation between characteristics of the respondents and their knowledge level (n=120)

Sl. no.	Variable	Correlation co-efficient ('r' value)
1.	Age	0.194[*]
2.	Education	0.181[*]
3.	Family size	0.127[NS]
4.	Land holding	0.158[*]
5.	Annual income	0.118[NS]
6.	Extension contact	0.067[NS]
7.	Extension participation	0.042[NS]
8.	Social participation	-0.076[NS]
9.	Mass media participation	0.158[*]
10.	Economic motivation	-0.082[NS]
11.	Innovativeness	-0.065[NS]

*Significant at 0.05 level; NS: Non-significant

Table 4: Multiple regression analysis of knowledge level of farmers with independent variables (n=120)

Sl. no.	Variable	b	Std. Error	't' value
1.	Age	0.052	0.024	2.128[*]
2.	Education	0.245	0.122	2.006[*]
3.	Family size	-0.006	0.092	-0.011[NS]
4.	Land holding	0.112	0.128	1.052[NS]
5.	Annual income	0.000	0.000	-0.727[NS]
6.	Extension contact	0.040	0.058	0.464[NS]
7.	Extension participation	0.015	0.072	0.303[NS]
8.	Social participation	-0.015	0.039	-0.452[NS]
9.	Mass media participation	0.062	0.041	1.418[NS]
10.	Economic motivation	-0.054	0.067	-1.007[NS]
11.	Innovativeness	-0.049	0.092	-0.656[NS]

R^2: 0.133; [*]Significant at 0.05 level; NS: Non-significant

Multiple regression analysis as presented in Table 4 reveals that all the eleven variables fitted together in the regression model explained only 13% of the variation in the knowledge level of saffron growing farmers. The calculated 't' value was significant at 0.05 level for age and education. The two partial 'b' values had positive relationship. Based on the t-test criterion, these two variables had contributed most for variation in the knowledge level of saffron farmers. As revealed in the results, these variables had significantly contributed to the change in knowledge level of the farmers. The findings were in conformity with the findings of Kafi (2000).

4. Conclusion

Afghanistan's saffron has got the highest rank with respect to quality assurance. This opportunity make the government and other allied agencies to disseminate the requirement technology in order to improve the cultivation and marketing of this plant due to the availability of huge demand at national and international markets. The paper recommends both institutional and market reforms to the government to tackle some of the existing challenges, specially the use of backward and forward potential to reach afghan saffron in real place in the word.

5. References

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