Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 3434-3436
Received: 19-07-2018
Accepted: 21-08-2018

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Knowledge of farmers about post-harvest practices of fennel in Sirohi district of Rajasthan

Dileep Kumar, RK Rathore, Jitendar Kumar Sharma and Pankaj Lawania

Abstract
Fennel is an important spice crops its seeds, leaves, and roots of fennel are safe and edible. Fennel has been widely used in culinary and medicinal preparations. At present post-harvest practices is most important for fennel seed. The present study was conducted in 10 villages of Pindwara panchayat samittee of Sirohi district of Rajasthan to know the knowledge of farmers about post-harvest practices of fennel. The result show that the respondents had maximum knowledge regarding the grading and packaging of fennel with Mean per cent score 85.5, followed by Harvesting and threshing 84.5 MPS and drying of fennel 53.5 MPS. Least knowledge was reported by the respondents in post-harvest Post-harvest Practices of fennel with MPS 26.0.

Keywords: Post-harvest practices, fennel**,** frequency distribution and MPS

Introduction
Fennel (*Foeniculum vulgare*) also known as *F. officinale* is a member of the umbelliferae or carrot family. Fennel has a thick, spindle shaped taproot that produces a pithy, smooth or finely-fluted round stem that may reach to 6 ft in height. The finely divided leaves, with numerous thread-like segments, grow from a sheath surrounding the stalk at the base of the leaf stem. The delicate, blue-green filiform leaf segments have a pungent scent. This characteristic is due to the presence of the phytochemical anethol, also a primary constituent of anise oil. Fennel's tiny yellow flowers form large, compound umbels. There are several different species and varieties of fennel that may be annual, biennial, or perennial. The seeds, leaves, and roots of fennel are safe and edible. Fennel has been widely used in culinary and medicinal preparations. Fennel seeds contain between 3% to 6 % of an essential oil and approximately 20 % of a fixed oil composed of petroselinic acid, oleic acid, and tocopherols. The essential oils of sweet and bitter fennel seed contains volatile oil, 90 % of which is identified as trans-anethole, upto 20 % fenchone and small amounts of other components include limonene, camphene, and alpha-pinene. Fennel is a sweet, aromatic, diuretic herb that relieves digestive problems, increases lactation, relaxes spasms and reduces inflammation with expectorant, carminative and aromatic properties.
In Rajasthan, Fennel occupies an area of 25587 hectares with an annual production of 30717 tonnes (Anonymous, 2015-16). It is mainly cultivated in the districts of Sirohi, Jodhpur, Nagour, Tonk, Dausa and Pali. In Sirohi, it is cultivated in an area of 5699 ha with production of 5082 tonnes. The productivity of fennel in Rajasthan is 1200.49 kg/ha and in Sirohi is 892. So fennel is a very promising spice to be used and marketed which can be rewarding for growers.
Thus, the present investigation was undertaken with the following specific objective to study the knowledge of farmers regarding fennel post-harvest practices.

Materials and Methods
This study was conducted in the Sirohi district of Rajasthan. Sirohi district is situated in the southern-west part of Rajasthan. It lies between the parallel of North latitude 24º17' to 25º17' and East longitude 72º16' to 73º10', having total geographical area of 5,17,947 hectares. Sirohi district comes under the agro-climate zone *Luni basin transitional plain*, (zone II-B) and *sub-humid southern plain* and *Aravalli hills*, (zone IV-A). Sirohi district consists of total five-panchayat samities *viz.* Sirohi, Reodar, Sheoganj, Abu road and Pindwara, out of these, one panchayat samiti was selected for the study on the basis of maximum area covered under fennel crop. Since Pindwara panchayat samiti fulfil this criterion, therefore, these was purposively selected for the study.

It was decided to select total ten sample villages from the selected panchayat samiti. Care was taken to select these ten villages which showed maximum area under fennel production as per the revenue record. Prior to collection of data, a comprehensive list of fennel growers was prepared in consultation with the patwari of selected villages and local influential persons. It was proposed to have 100 respondents. Random selection procedure was followed in village wise selection of respondents.

Personal interview and observation technique were used to collect data from the respondents. Frequency distribution, percentage and MPS were used to analyze the data.

Result and Discussion

Background information of the respondents

Nearly half of the respondents belong to the age group of 30-35 years and 32 percent were below 30 years of age.60 percent of them were under reserve caste categories *i.e*. SC, ST, and OBC 44 per cent of the respondents were illiterate, 28 per cent could read and write. Only 18 per cent respondents were educated up to secondary level and 10 farmers were graduate also. Agriculture was the main occupation but all of the respondents were involved in subsidiary occupation. Majority of the respondents 81 percent were living in joint families. More than 45 percent respondents had land holding above 2 ha whereas, nearly 40 per cent had 1-2 ha of land holding. Regarding source of information family members were major source of information.

Knowledge of the respondents regarding Post-Harvest Practices of fennel

To find out the knowledge of the respondents about Post-Harvest Practices of fennel four components were identified and knowledge of the respondents was judged in light of these. The results pertaining to this have been presented as under:

Table-1 presents component wise knowledge of the respondents in Post-Harvest Practices of fennel. The respondents had maximum knowledge regarding the grading and packaging of fennel with Mean per cent score 85.5, followed by harvesting and threshing 84.5 MPS and drying of fennel 53.5 MPS. Least knowledge was reported by the respondents in relation to processing and preparation of Post-Harvest Products of fennel with MPS 26.0.

Table 1: Component wise knowledge of respondents about Post-Harvest Practices of n-100

S. No	Component	MPS
1	Harvesting & threshing	84.5
2	Drying of Fennel	53.5
3	Grading and packaging of fennel	85.5
4	Post-harvest products of fennel	26.0

Harvesting and Threshing

Table-2 indicates that 97 per cent respondents knew about type of harvesting for fennel cultivation. Approximately similar 95 per cent respondents knew about recommended time of harvesting of fennel. The respondents had good knowledge about manual threshing (88 per cent). Nearly half of the respondents knew about use of thresher in threshing of fennel which is 55 per cent.

Table 2: Distribution of respondents by their knowledge regarding harvesting and threshingn-100

S. No.	Harvesting & threshing	F/%
1	Recommended time of harvesting	95
2	Type of harvesting	97
3	Manual threshing	88
4	Use of thresher	55

Drying of fennel

It was good to know that majority of the respondents (97 per cent) know the traditional method of fennel drying (Table-3). When the respondents were asked about the moisture percentage present at the time of drying, than a good number of respondents (74.0 per cent) knew about the maximum moisture per cent present at drying.

Table 3: Distribution of respondents regarding their knowledge about drying of fennel n-100

S. No.	Drying of Fennel	F/%
1	Solar dryer	26
2	Drying by electric dryer	11
3	Traditional method	97
4	Maximum moisture per cent at drying	74

Grading and packaging of fennel

Data presented in table -4 indicated that 95 per cent respondents knew about grading of umbels based on colour of fennel seed. Similar percentage of the respondents knows about grading on the basis of size of fennel seed.

Table 4: Distribution of respondents by their knowledge regarding Grading and packaging of fennel n-100

S. No.	Grading and packaging of fennel	F/%
1	Grading of umbel on the basis of size	91
2	Grading of umbel on the basis of colour	95
3	Grading on the basis of size of seed	95
4	Grading on the basis of colour of seed	91
5	Recommended packaging material	66
6	Packing in polythene bags	75

Post-harvest products of fennel

Table -5 indicates that 86 per cent respondents knew about dried fennel and 74 per cent respondents also know about preparation techniques of dried fennel. Table also reveals that majority of the respondents had poor knowledge about post-harvest products of fennel.

Table 5: Distribution of respondents related to knowledge regarding Processing and preparation of Post-harvest products of fennel n-100

S. No.	Post-harvest products of fennel	F/%
1	Fennel squash	5
2	Fennel sarbat	11
3	Dried fennel	86
4	Fennel supari	25
5	Mouth freshener	28
6	Preparation technique of squash	0
7	Preparation technique of sarbat	0
8	Preparation technique of dried fennel	74
9	Preparation technique of fennel supari	11
10	Preparation technique of mouth freshner	12

The result are in conformity with that of Sanadhya (1997) where she reported that respondents of both zone (IVb & V)

had maximum knowledge in winnowing (63.50 and 76.33 MPS), components whereas minimum knowledge was recorded in marketing 6.61 and 20.68 MPS) and use of fumigants (21.54 and 33.83 MPS). The present finding also in conformity with that of Jaitawat *et. al*. (2012) [5], they shows that training needs of marginal and small farmers were more than large farmers in all practices of fennel cultivation except post-harvest technology for export quality and selection of seed & seed treatment. This might be due to the reason that large farmers need more training in post-harvest technology. As far as the knowledge about harvesting, threshing and storage was concerned, Sharma *et. al*. (2017) [6] found that 64.00, 66.00 and 74.00 per cent knowledge was recorded by marginal, small and large farmers, respectively.

Conclusion

Based on the findings, it could be concluded that majority of the respondents had poor knowledge about Post-Harvest Practices of fennel. Hence it is utmost important to educate and need based skill oriented training programme should be conducted well in advance before the commencement of the crop season to improve the skills and competency of the farmers in adopting the improved Post-Harvest Practices of fennel, so that the existing technological gap could be minimized.

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