

Original Research Article

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Evaluation of Fennel (*Foeniculum vulgare* Mill) Genotypes for Seed Yield and its Attributing Traits in Madhya Pradesh, India

Meenakshi Ramgiri¹ and Reena Nair^{2*}

¹AICRP on Vegetable Crops, Department of Horticulture, JNKVV, Jabalpur

²Department of Horticulture, JNKVV, Jabalpur, India

*Corresponding author

ABSTRACT

Keywords

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Evaluation of Fifteen Fennel (*Foeniculum vulgare* Mill.) genotypes collected from different states for identifying the suitable genotypes for Central India with higher seed yield per plant and other yield and its attributing traits during 2015-16 and 2017-18 recorded significant differences and wide range of variation among the genotypes for all the characters studied. With respect to seed yield q/ha AF-206 (11.55 q/ha) was found to be the highest yielder followed by AF-205 and NDF-67 with 11.53 and 11.34q/ha yield. AF-206 was also early flowering and the percent increase over yield of check variety RF-101 and RF-205 is 37.17 % and 17.14% respectively. The genotype NDF-51, UF-290, UF-291, AF-205, HF-212, HF-212 were found promising in respect of farmers preference.

Introduction

Fennel (*Foeniculum vulgare* Mill.), belongs to family Apiaceae and is native of Europe and Mediterranean region its seeds are used as spices. Mature fennel fruits and essential oil are used as flavouring agents in food products such as bread, pickles, pastries, cheese etc. Fennel fruits are used in diseases like cholera, bile disturbances, nervous disorders, constipation, dysentery and diarrhea and also used for control of diseases attacking chest, lungs, spleen, and kidney and in colic pain.

The importance of fennel based on its medicinal value and export potential as spices was recognized long back but it remained neglected for a long time from scientific attention for its improvement in its productivity as well as its quality (Choudhary *et al.*, 2017). The success of any breeding methodology for improving morphological characters depends primarily on the existence of high magnitude of genetic variability and its efficient utilization. Although many improved varieties of fennel have been released in the country but still there is no

improved variety released from Madhya Pradesh for Central India. Hence, there is still ample scope for crop improvement by traditional and advanced methods of breeding to increase the adaptability and productivity of the crop. The objectives of the present study was to evaluate the performance of thirteen genotypes of fennel with two check RF-101 and RF-205 received from various parts of the country under AICRP on Seed Spices for growth and yield parameters under Kymore Plateau and Satpura Hills Agroclimatic zones of Madhya Pradesh.

Materials and Methods

Thirteen fennel genotypes along with two checks RF-101 and RF-205 were evaluated in randomized block design (RBD) with three replications during *rabi* for three consecutive years 2015-2016 to 2017-18 at Department of Horticulture, JNKVV, Jabalpur. Each entry was sown in plots of size 3×2.4 m at 30 cm and 10 cm distance between rows and plants, respectively. Timely management practices were followed to grow a good crop. All the recommended agronomic practices were adopted for raising a good crop.

The data on days to first flowering was recorded on plot basis, while ten randomly selected plants from each of the entry in each replication were tagged for recording the observations on plant height (cm), number of branches per plant, number of umbels/ plant and Seed yield q/ha. Analysis of variance was carried out as per the procedure suggested by Panse and Sukhatme, 1963.

Results and Discussion

The pooled mean squares due to genotypes were highly significant for all the characters indicating that the presence of genetic diversity in the material (Table 1) Sengupta *et al.*, (2014) Ghanshyam *et al.*, (2015) and

Mamatha *et al.*, (2017) reported the same findings in thirteen genotypes of fennel evaluated at Vegetable Research Farm, Department of Horticulture, JNKVV, Jabalpur. Scrutiny of results on days to first flowering revealed that genotype JF-576 was earliest which flowered in 92.55 days and was at par with AF-206 (93.22 days) and national check RF-101 (94.11 days). Plant height varied from 141.407 cm to 174.153cm. Genotype NDF-51 (174.15 cm) was the tallest followed by UF-290 (167.96 cm) and AF-205 (167.67 cm). These two genotypes are at par with NDF-51. Minimum height was recorded in check variety RF-205 (141.41 cm). In case of number of branches per plant check variety RF-101 recorded the highest number of branches (8.83) whereas it was minimum (6.81) in JF-576. Fennel genotypes HF-212 and HF-212 were found to be at par with 8.56 and 8.51 branches per plant respectively. Number of umbels per plant was observed to be maximum in check variety RF-101 (22.22) which was at par with UF-291 (18.47) and another check variety RF-205 (18.27). HF-212 (13.12) had minimum number of umbels per plant. With respect to seed yield q/ha AF-206 (11.55 q/ha) was found to be the highest yielder followed by AF-205 and NDF-67 with 11.53 and 11.34q/ha yield. AF-206 was also early flowering. PF-1 was found to be poor yielder with just 5.36q/ha seed yield.

The percent increase in yield of the genotypes over the two national check is depicted in Table-2. The scrutiny of the data shows that the increases in seed yield of AF-206 over the check varieties RF-101 and RF-205 is 37.173 and 17.140 respectively. Likewise, for AF-205 it was 36.936% and 16.937% increase over RF-101 and RF-205 respectively. Genotype PF-1 was the lowest yielder also as well as reported to have reduced yield than the check varieties by -36.342% and -45.639 %.

Table.1 Performance of Fennel genotypes for growth parameters pooled data of three years (2015-16 to 2017-18)

S. No	Varieties	Days to first flowering	Plant height	No. of branches/plant	No. of umbels/plant	Seed yield (q/ha)
1.	JF-576	92.55	160.09	6.81	16.99	10.16
2.	JF-2012-9	95.11	159.09	7.65	14.23	8.95
3.	UF-290	94.44	167.96	8.01	14.87	9.72
4.	UF-291	96.22	165.10	7.99	18.47	8.94
5.	AF-205	96.44	167.67	8.12	14.12	11.53
6.	AF-206	93.22	165.17	6.84	14.71	11.55
7.	NDF-51	98.67	174.15	7.24	15.70	10.92
8.	NDF-67	99.89	167.24	7.36	16.74	11.34
9.	HF-151	95.00	164.56	7.55	17.82	7.60
10.	HF-212	96.00	159.72	8.56	13.12	7.42
11.	RF-15	99.44	160.77	8.51	17.18	9.75
12.	RF-68	92.55	162.51	6.85	16.75	7.03
13.	PF-1	99.67	159.78	7.85	16.99	5.36
14.	RF-101 (NC)	94.11	146.84	8.83	22.22	8.42
15.	RF-205 (NC)	97.44	141.41	7.45	18.27	9.86
	CD 5%	4.67	13.20	1.20	4.11	2.23
	SEm±	1.60	4.53	0.41	1.41	0.77
	SEd	2.27	6.41	0.58	2.00	1.08
	CV %	2.89	4.86	9.26	14.78	14.38

Table.2 Performance of fennel genotypes for the seed yield (Pooled)

S. No	Varieties	Seed yield (q/ha)	% increase over Check RF-101	% increase over Check RF-205
1.	JF-576	10.16	20.665	3.043
2.	JF-2012-9	8.95	6.295	-9.229
3.	UF-290	9.72	15.439	-1.420
4.	UF-291	8.94	6.176	-9.331
5.	AF-205	11.53	36.936	16.937
6.	AF-206	11.55	37.173	17.140
7.	NDF-51	10.92	29.691	10.751
8.	NDF-67	11.34	34.679	15.010
9.	HF-151	7.60	-9.739	-22.921
10.	HF-212	7.42	-11.876	-24.746
11.	RF-15	9.75	15.796	-1.116
12.	RF-68	7.03	-16.508	-28.702
13.	PF-1	5.36	-36.342	-45.639
14.	RF-101 (NC)	8.42		
15.	RF-205 (NC)	9.86		
	CD 5%	2.23		
	SEm±	0.77		
	SEd	1.08		
	CV %	14.38		

Therefore due to the range of variation in the mean values it is substantiated that variability is present in the germplasm and there is a scope for selection of genotypes with desirable component characters for breeding program.

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