



Research Article

NARENDRA METHI-2: SCREENING OF HIGH YIELD VARIETY AND ANCILLARY OBSERVATIONS OF FENUGREEK (*Trigonella foenum graecum* L)

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Abstract: Fenugreek (*Trigonella foenum-graecum*) is self-pollinated crop. It occupies a prime position among various seed spices grown in India. The plant leaves and seeds are widely consumed in Indo-Pak subcontinent. Fenugreek is high influence of environment on the morpho-physiological expression, therefore the aim of this work to develop new high yielding variety to perform uniformed under different environmental condition. High yielding genotype (NDM-69) was identified among the pooled germplasm of N.D. university of Agriculture & Technology, Ayodhya by selection methods. The NDM-69 was evaluated for alkalinity and disease tolerance under natural field condition. This genotype has been tested at 13 centres under AICRP on Spices for yield potential. On the basis of data collected from the different centre variety Narendra methi-2 (NDM-69) has been recommended for release in the workshop of AICRP on Spices. Narendra methi-2(NDM-69) has been tested with national check Hisar Sonali and found 14.74 percent high seed yield. The yield was found variable in location to location due to variance of environmental condition. On the basis of pooled seed yield of fenugreek entries tested under the coordinated varietal trial goes 1st rank to UM-354, 2nd to AFG-5 and 3rd to NDM-69. The variety has shown strong genetic stability under different environmental conditions which can face the natural challenges and remain sustainable to produce good seed yield.

Keywords: Fenugreek, Variety, Leaf spot disease, Growth and yield

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Introduction

Fenugreek (*Trigonella foenum graecum* L.) locally known as Methi is an important multipurpose winter season seed spice crop mainly grown in Rajasthan, Gujarat, Madhya Pradesh, Maharashtra, Uttar Pradesh, Haryana, Punjab and Bihar. The seed of fenugreek are used as a cardiment and seasoning agent of garnishing and flavourings dishes and it has many medicinal properties like diuretic, tonic, carminative and aphrodisiac [1]. Its tender leaves are consumed as leafy vegetable, chopped leaves are mixed in flour to prepare Paratha [2]. In India fenugreek is covering an area 93090 ha with an annual production and productivity of 112845 tonnes and 1212.2 kg/ha, respectively in year 2012-13 [3]. The production potential of the crop has not been fully exploited due to lack of high yielding variety with resistant to biotic and abiotic factors. It is well known that phenotype is the product of interaction between environment and genotype. A particular genotype may express its full genetic potential only under optimum environmental conditions. Therefore, it has been observed that relative performance in a set of varieties is altered, when comparisons are made over series of environments. Stability in the performance is one of the most desirable characteristics of a genotype to be released as a variety for wide commercial cultivation and that is one of the major objectives in this programme to develop stable variety so that effects of environment on yield can be minimized. Therefore, the present investigation was planned to test newly bred lines of fenugreek for their high yield under different centre across the India.

Materials and Methods

The experimental material for present investigation was comprised sixty diverse elite lines viz, JFg 245, JFg 266, AFG 5, AFG 6, LFC 98, LFC 93 and HM 259, HM 280-1, UM 202, UM 354, NDM 69, NDM 72, RM 188, RM 194, Hisar sonali (NC), RMT 361 (NC) of fenugreek.

The seed materials of fenugreek genotypes were obtained from coordinated unit of AICRP on spices IISR, Kozhikode Kerala, India. The crop was sown during *rabi* 2012-13 to 2014-15 under central varietal trial (CVT) in all 13 centers viz; Ajmer, Jobner, Kota, Hisar, Jagudan, Pantnagar, Jabalpur, Dholi, Raigarh, Coimbatore, Guntur, Navsari, Kumarganj. This fenugreek line was evaluated 2.0 x 2.4 m² area. Row to row and plant to plant distance was kept 30 cm and 10 cm respectively in randomized block design (RBD) with three replications of each genotype at each centre. All the recommended package and practices were followed to raise the good normal crop. In addition to it, variety Narendra Methi-2 has been tested at Vegetable farm, N. D. University of Agriculture and Technology, Kumarganj, Faizabad from 2007 to 2012 in the name of NDM-69. It was also grown at different KVKs and farmers field. The percent disease intensity of downy mildew was recorded at second week of March using 0-4 scale given by earlier workers. The tested entries were graded 0- No disease symptoms, 1- Resistant, 2- Moderate resistant, 3- Susceptible, 4- Highly susceptible. Growth data were recorded at the time of 50% flowering. The yield data were recorded after the harvest.

Alkalinity tolerance

The experiment has been conducted during *rabi* 2006-07 to 2008-09 to identify alkalinity tolerance genotypes under greenhouse condition at 10, 20, 30 and 40 ESP level. Ten fenugreek genotypes were sown at each ESP level in three replications. Twenty seeds were sown in each pot at the depth of 2 cm. Standard agronomical practices were followed during the experiment. Yield data per plants were observed at the maturity of the seed

Results and Discussion

Narendra methi-2 has been tested from 2007-08 to 2011-12 with national check Hisar Sonali across 41 location [Table-1] revealed 14.74 percent high seed yield.

The yield was found variable in location to location due to variance of environmental condition [Table-1a] The seed yield of Narendra methi-2 was recorded highest at Jobner in 2014-15 (3019 Kg/ha) and Hisar in 2013-14 (2585.7 Kg/ha) in comparison to national check Hisar Sonali at Jobner 2014-15 (2803.2 Kg/ha) and Hisar in 2013-14 (2542 Kg/ha). The yield performance of fenugreek genotypes was found minimum at Coimbatore in 2013-14 but NDM-69 (Narendra Methi-2) produced highest yield 321Kg /ha in comparison to 313Kg/ha (Hisar Sonali) Pooled yield of NDM-69 (Narendra Methi -2) was 1449.28Kg/ha and Hisar Sonali 1262.99 Kg/ha across all 41 location.

Table-1 Summary of performance of fenugreek varieties in Station and coordinated trials at different locations across the country for Seed yield (kg/ha)

Particulars	Narendra Methi-2 (NDM-69)	National check Hisar Sonali
Years of testing	2007-08 to 2011-12	2007-08 to 2011-12
Total yield over the locations/years	59420.84	51782.59
No of locations / years	41	41
Mean	1449.28	1262.99
% increase over National check Hisar Sonali		14.74

Table-1a Seed yield (kg/ha) of fenugreek varieties in Station and coordinated trials at different locations across the country

Year	Location	Narendra Methi-2 (NDM-69)	Hisar Sonali (National Check)
2007-08	NDUAT, Kumarganj	1510	1240
2008-09	NDUAT, Kumarganj	1630	1250
2009-10	NDUAT, Kumarganj	971	954
2010-11	NDUAT, Kumarganj	2013	1640
2011-12	NDUAT, Kumarganj	1711	1440
2012-13	NDUAT, Faizabad	1284	1305
2013-14	NDUAT, Faizabad	1483	1312
2014-15	NDUAT, Faizabad	1103	1110
2012-13	Kota	1563	1233
2012-13	RAU, Dholi	1750	1111.11
2013-14	RAU, Dholi	1848.89	1332.22
2014-15	RAU, Dholi	1955.56	1177.78
2012-13	Hissar	1758	2225
2013-14	Hissar	2585.7	2542
2014-15	Hissar	1648	2025
2012-13	SKRAU, Jobner	2194.4	1773.2
2013-14	SKRAU, Jobner	1615.7	1967.6
2014-15	SKRAU, Jobner	3019	2803.2
2012-13	JNKVV, Jabalpur	1736	1875
2013-14	JNKVV, Jabalpur	880	903
2014-15	JNKVV, Jabalpur	1713	2083.4
2009-10	NDUAT, Faizabad	1284	1305
2010-11	NDUAT, Faizabad	1483	1312
2011-12	NDUAT, Faizabad	1103	1110
2013-14	TNAU, Coimbatore	373	359
2014-15	TNAU, Coimbatore	321	313
2011-12	Pant Nagar	1806	1519
2009-10	Pant Nagar	2532	2245
2010-11	Pant Nagar	2023.15	2199.08
2012-13	RARU, Raigarh	544.67	550.47
2013-14	RARU, Raigarh	566.2	705.1
2015-16	RARU, Raigarh	105	156
2012-13	Guntur	1100.4	951.69
2013-14	Guntur	1172.6	1012.1
2015-16	Guntur	1146	995.7
2012-13	Navsari	802	642
2013-14	Navsari	1117	1117
2015-16	Navsari	1006	929
2012-13	Jagudan	1839	1357
2013-14	Jagudan	1828	1371
2015-16	Jagudan	1730	1471
	Mean	1449.28	1262.99
	% increase over National check Hisar Sonali		14.74

On the basis of pooled seed yield [Table-2] of fenugreek entries tested under the coordinated varietal trial goes 1st rank to UM-354 (1754.20 Kg/ha), 2nd to AFG-5 (1658.76 Kg/ha) and 3rd to NDM-69 (1622.12 Kg/ha), which are higher 13.45%, 7.27% and 4.90% to Hisar Sonali and 14.15%, 7.94% and 5.55% to Rmt-

361 respectively. Narendra Methi-2 yielded highest at Kumarganj during 2010-11 (2013 Kg/ha) and lowest in 2014-15 (1103Kg/ha) as comparative to Hisar sonali 1640 Kg/ha in 2010-11 and 1110 Kg/ha in 2014-15 [Table-2a].

Table-2 Performance of entries in Coordinated Varietal Trial (Seed yield kg/ha)

Genotype	Mean	Rank	% higher Hisar Sonali	% higher Rmt-361
JFg 245	1442.05	14	-6.74	-6.17
JFg 266	1421.29	15	-8.08	-7.52
AFg 5	1658.76	2	7.27	7.94
AFg 6	1448.04	13	-6.35	-5.78
LFC 98	1574.98	5	1.85	2.48
LFC 93	1537.27	7	-0.58	0.03
HM 259	1531.19	9	-0.98	-0.37
HM 280-1	1491.11	11	-3.57	-2.97
UM 202	1594.66	4	3.13	3.76
UM 354	1754.26	1	13.45	14.15
NDM 69	1622.12	3	4.9	5.55
NDM 72	1509.71	10	-2.37	-1.76
RM 188	1254.714	16	-18.86	-18.36
RM 194	1450.18	12	-6.22	-5.64
Hisar sonali (NC)	1546.3	6	0	0.62
Rmt 361 (NC)	1536.8	8	-0.61	0

Table-2a Seed yield (kg/ha) of fenugreek varieties in CVT at NDUAT, Kumarganj

Year	Location	Narendra Methi-2 (NDM-69)	Hisar Sonali (National Check)
2010-11	NDUAT, Kumarganj	2013	1640
2011-12	NDUAT, Kumarganj	1711	1440
2012-13	NDUAT, Faizabad	1284	1305
2013-14	NDUAT, Faizabad	1483	1312
2014-15	NDUAT, Faizabad	1103	1110
	% increase over Hisar Sonali		13.73

Results [Table-3] indicated that the HM-259 recorded maximum plant height (75.37cm) and minimum number of branches (4.45/plant), no of pods (44.23/plant) and pod lengths (9.73cm). NDM-69 (Narendra Methi-2) recorded largest pod length (11.04), highest grain /per pod (16.56) and grain yield (12.90q/ha). NDM-69 got 3rd rank in overall pooled seed yield of fenugreek under coordinated varietal trial across the country. In spite of NDM-69 got first rank at Jobner and Dholi, 2nd at Jabalpur, Pantnagar and Jagudan and 3rd at Raigarh, Coimbatore and Guntur [Table-4]. The cumulative influence of growth and yield attributes ultimately increased the seed yield of fenugreek. These results are in close conformity with the finding of Saxena and Kakani [4], Chaudhary [5], Gill et al [6] and Nandekar et al [7]. Yield performance of fenugreek genotypes at 40 ESP level was higher in NDM-69 (3.12g, 3.12g, and 3.43g) and NDM-61 (3.12g, 3.02g, 3.0g) at 2006-07, 2007-08 and 2008-09. Differences of 30 and 40 ESP were attributed to a very high soil pH, which limited plant growth of cowpea [8]. Out of 16 genotypes five were sown resistant, nine moderate resistant and two susceptible reactions at both Kumarganj and Jobner test centre. None of the genotypes were found immune and highly susceptible reaction against to downy mildew. However, AFG-5, LFC-98, Um-202, NDM-69 and Rmt-361 (Check) were found resistant with percent disease intensity of 18.99, 18.52, 19.69, 14.31 and 18.19, respectively. The genotypes JFg-245, JFg-266, AFG-6, LFC-93, Hm-280-1, NDM-72, Rm-188, Rmm-194 and Hisar sonali were sown moderate resistant reaction with ranging 24.48 to 36.97 PDI. The susceptible genotypes from Hm-259 and Um-354 were sown 53.20 and 42.54 percent disease intensity at Kumarganj. Whereas, at Jobner, AFG-5, Um-202, NDM-69, Rm-188 and Rmt-361 were sown resistant reaction with 15.83, 6.66, 16.66, 10.83 and 13.33 percent disease intensity, respectively. The genotypes JFg-266 (23.33PDI), AFG-6 (39.19 PDI), LFC-98 (35.0PDI), Hm-280-1(38.33PDI), Um-354 (36.99PDI), NDM-72(28.33 PDI) and Hisar sonali (28.33PDI) were found moderate resistant reaction, rest of the genotypes were sown downy mildew susceptible reaction at Jobner. The findings are supported with earlier workers (15,13,8). Yield data of 16 genotypes [Table-1] revealed that highest grain yield was recorded in JFg-245 (1402Kg/ha) and lowest Hisar sonali (1231Kg/ha) at Kumarganj. Rm-188 (1489.35Kg/ha), NDM-69 (2276.39Kg/ha) and Um-202 (2186.73 Kg/ha) produces highest seed yield at Jobner.

Table-3 Yield and ancillary observations of Fenugreek variety Narendra methi-2 (NDM-69) in All Indian Coordinated Varietal Trial during 2012-13 to 2014-15 (Pooled) at Kumarganj, Faizabad

SN	Entries	Plant height (cm)	No branches/ Plant	No. of Pods/ plant	Length of Pod (cm)	No. of grain/pod	Days to maturity	Yield(q/ha)
1	AFG-6	67.13	4.72	47.95	11.03	16.05	126.65	12.61
2	HM-259	75.37	4.45	44.23	9.73	15.79	125.43	12.75
3	HM-280-1	73.75	4.98	46.8	10.71	16.09	122.67	12.84
4	NDM-69	68.42	4.46	45.82	11.04	16.56	123.78	12.9
5	H. Sonali (ch)	74.32	4.57	47.02	11.07	15.42	123.76	12.31
6	Local (ch)	70.19	4.11	41.87	10.34	14.42	115	11.39
	CD	10.02	0.85	8.78	1.84	1.72	5.24	1.33
	CV (%)	11.52	0.36	4.07	1.22	0.76	2.22	0.42
	SEm±	2.75	0.61	2.54	0.78	0.56	1.6	0.42

Table-4 Coordinated Varietal Trial of Fenugreek (pooled mean of seed yield (kg/ha) over three years i.e., 2012-13, 2013-14 and 2014-15)

SN	Entry	Ajmer	Jobner	Kota	Hisar	Jagudan	Pantnagar	Jabalpur	Navsari	Kumarganj	Dholi	Raigarh	Coimbatore	Guntur	Over all Mean	Rank
1	JFg 245	1342.56	1853.4	1302	1717.1	1888	1535.5	1370.38	841.56	1402	1073.33	396.63	322.9	1208.5	1250.3	
2	JFg 266	1620.93	2052.47	1186	1609.23	1757	1089.51	1135.81	983.54	1370	1190.37	273.84	325.49	1175.8	1213.08	
3	AFg 5	1907.6	2087.19	1030	2055.33	1966	1847.99	1350.32	1269.55	1388	1218.89	231.4	373.52	1552.2	1406	II
4	AFg 6	1523.73	1645.06	1221	1705.43	1548	1527.78	1365.75	1199.59	1261	1764.07	261.62	338.64	859.3	1247.77	
5	LFC 98	1621.59	2090.43	972	2188.9	1607	1961.42	1211.43	1098.77	1333	1246.67	289.74	386.23	1528	1348.86	
6	LFC 93	1406.65	1939.81	1256	2450.56	1709	2083.34	1252.58	829.22	1365	1264.81	191.58	347.53	1060.1	1319.71	
7	Hm 259	1692.9	2226.08	1088	2334.66	1288	1965.74	1342.58	849.79	1275	1405.92	229.4	365.56	1039	1315.59	
8	Hm 280-1	1731.85	2149.69	1204	2152.66	1592	1794.76	1327.17	843.62	1284	1225.56	471.51	332.96	864.5	1305.71	
9	Um 202	1829.01	2186.73	1239	2046.33	1487	2041.67	1327.17	845.68	1400	1176.3	265.67	358.09	1640.3	1372.53	
10	Um 354	1892.89	2085.65	1215	2354.56	1768	2324.08	1830.59	1253.09	1347	1246.67	737.24	341.6	1579.6	1536.61	I
11	NDm 69	1293.94	2276.39	1198	1997.23	1869	2120.37	1442.91	975.31	1290	1851.48	405.1	348.83	1139.5	1400.62	III
12	NDm 72	1680.03	2106.48	1206	1852.43	1467	2055.56	1427.48	895.06	1310	1207.41	307.82	348.21	1072.4	1302.76	
13	Rm 188	1240.02	1489.35	1128	1491.53	1508	2007.72	1157.41	850.82	1373	1365.19	303.55	370	524.2	1139.14	
14	Rm 194	1305.96	1875	1088	1786	1643	1804.01	1373.47	876.54	1335	1777.22	955.14	357.53	1229.7	1338.97	
15	Hisar sonali (NC)	1527.55	2181.33	1360	2183	1481	1987.66	1620.38	-	1231	1063.33	417.93	326.67	986.5	1363.86	
16	Rmt 361 (NC)	1628.21	2129.63	1372	2126.66	1371	2070.99	1466.06	926.95	1242	1207.04	525.02	337.96	1104.7	1346.79	

Table-5 Screening of salinity tolerant genotypes of fenugreek at Kumarganj from 2006-07 to 2008-09

Variety	Yield (g/plant)											
	2006-07				2007-08				2008-09			
	10 ESP level	20 ESP level	30ESP level	40 ESP level	10 ESP level	20ESP level	30 ESP level	40ESP level	10 ESP level	20 ESP level	30 ESP level	40 ESP level
V1 (NDM-51)	4.93	4.3	3.2	2.87	4.93	4.35	3.2	2.87	5.08	4.48	3.47	2.82
V2 (NDM-52)	5.08	4.17	3.08	2.87	4.9	4.27	3	2.85	4.67	4	3.07	2.66
V3 (NDM-53)	4.64	4.25	3.08	3	4.5	4.22	3	2.9	4.52	4.08	3.1	2.5
V4 (NDM-54)	4.81	3.37	3.08	2.63	4.88	3.4	3.08	2.7	4.6	4	3.33	2.88
V5 (NDM-55)	4.7	4.2	3.45	3.12	4.73	4	3.5	2.93	4.67	4.17	3.37	3
V6 (NDM-56)	4.12	3.5	3.12	2.63	4.05	3.68	3.02	2.4	4	3.87	3.17	2.87
V7 (NDM-61)	5.17	4.5	3.98	3.12	5.13	4.57	3.58	3	4.97	4.73	3.6	3
V8 (NDM-67)	5.2	4.13	3.08	2.83	5.23	4.53	3.67	2.43	5.13	4.6	3.47	2.9
V9 (NDM-69)	5.63	4.37	3.18	2.98	5.55	4.78	4.13	3.12	5.38	4.73	3.9	3.43
V10(NDM-72)	3.83	3.37	2.53	2.17	4.2	3.5	3	2.68	4.27	3.43	3.1	2.78
CD at 5%	0.178	0.178	0.213	0.16	0.249	0.224	0.197	0.23	0.213	0.289	0.231	0.201
SEm±	0.019	0.018	0.022	0.017	0.0265	0.239	0.021	0.025	0.028	0.022	0.024	0.021

Table-6 Compression of yield performance of NDM-69 with Hisar Sonali at different KVK and farmers field

SN	Test centres	Mean yield in genotype(q/ha)	
		NDM-69	Hisar Sonali (ch)
1	KVK, Gonda	14.54	12.22
2	KVK, Bahraich	15.08	12.15
3	KVK, Faizabad	15.8	12.2
4	KVK, Mau	14.45	12.1
5	Farmers field	14.56	12.16

Table-7 Screening of fenugreek genotypes in Coordinated Varietal Trial against downy mildew disease at Kumarganj and Jobner (Pooled data of 2012-13 to 2014-15)

SN	Genotype	Kumarganj			Jobner		
		PDI	Reaction	Yield(kg/ha))	PDI	Reaction	Yield(kg/ha))
1	JFg-245	24.48	MR	1402	54.16	S	1853.4
2	JFg-266	36.97	MR	1370	23.33	MR	2052.47
3	AFg-5	18.99	R	1388	15.83	R	2087.19
4	AFg-6	31.91	MR	1261	39.16	MR	1645.06
5	LFC-98	18.52	R	1333	35	MR	2090.43
6	LFC-93	31.39	MR	1365	67.5	S	1939.81
7	Hm-259	53.2	S	1275	45	S	2221.08
8	Hm-280-1	32.08	MR	1284	38.33	MR	2149.69
9	Um-202	19.69	R	1400	6.66	R	2186.73
10	Um-354	42.54	S	1347	36.99	MR	2085.65
11	NDM-69	14.31	R	1290	16.66	R	2276.39
12	NDM-72	28.99	MR	1310	28.33	MR	2106.48
13	Rm-188	30.76	MR	1373	10.83	R	1489.35
14	Rm-194	29.69	MR	1335	25.83	MR	1875
15	Hisar Sonali (NC)	32.6	MR	1231	28.33	MR	2181.33
16	Rmt-361(NC)	18.19	R	1242	13.33	R	2129.63
	CD at 5%	16.54		74.25	13.78		353.8

0-No disease, 0-20-Resistant, 21-40-Moderate Resistant, 41-60Susceptible, > 60 Highly Susceptible

Table-8 Yield performance of Fenugreek variety Narendra methi-2 (NDM-69) at different KVKs

Seed yield (q/ha) in KVK's									
Variety	Gonda		Bahraich		Faizabad		Mau		Mean
	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	2013-14	2014-15	
AFg-6	12.3	12.37	12.23	12.2	12.63	12.47	12.3	12.5	12.38
HM-259	13.27	13.3	13.1	13.3	13.2	13.47	12.9	13.13	13.21
NDM-69	14.7	14.37	15.03	15.13	15.5	16.1	14.53	14.37	14.97
NDM-72	12.5	12.5	12.35	12.3	12.38	12.45	12.45	12.32	12.41
H. Sonali (ch)	12.17	12.27	12.2	12.1	12.3	12.1	11.93	12.27	12.17
local ch	11.52	11.4	11.5	11.55	11.6	11.5	11.4	11.63	11.51
CD	0.12	0.15	0.1	0.14	0.1	0.07	0.08	0.12	0.11
CV (%)	0.17	0.22	0.14	0.2	0.14	0.1	0.12	0.17	0.16
SEM	0.038	0.048	0.031	0.045	0.031	0.022	0.026	0.038	0.035

Table-9 Comparative Yield performance of Fenugreek variety Narendra methi-2 (NDM-69) at different farmers field

Variety	Mean Seed yield (g/ha) at farmers field						mean
	Faizabad	Barabanki	Amethi	Sitapur	Sant Kabir Nagar		
AFg-6	12.5	12.05	12.45	12.5	12.4		12.38
HM-259	13.1	13.05	13.1	13	13.4		13.13
NDM-69	14.4	14.45	14.5	14.4	15.05		14.56
NDM-72	12.35	12.2	12.3	12.3	12.25		12.28
H. Sonali (ch)	12.1	12.15	12.25	12.15	12.15		12.16
local ch	11.73	12.08	11.97	11.9	12.025		12.01
CD	2.86	2.45	2.26	2.15	2.45		2.09
CV (%)	3.55	3.25	3.05	2.85	3.12		3.14
SEM	0.93	0.78	0.88	0.59	0.76		0.57

Average yield of fenugreek was reported from 150-2800 Kg/ha by growers under dryland conditions [9] and good management condition it was recorded 10-11q/ha [10]. Therefore, it is concluded that two genotypes viz AFg-5 and NDM-69 were found high yielding with resistant reaction against downy mildew at both test centres. Thus, these Alkalinity level, year, and genotypes showed significant effects ($P \leq 0.05$) on yield parameters measured in the study. The genotype \times ESP level interaction was found significant for per plant yield [Table-1]. A pH of 8-8.5 is favoured by the Fenugreek is fairly salt tolerant and, can be grown in low to moderate saline soils [11]. Average yield of NDM-69 per plant at 10ESP was found significantly superior among all genotypes during 2006-07 (5.63g), 2007-08 (5.55g) and 2008-09 (5.38g). At 20ESP, it gave significantly higher yield in 2006-07(4.78g) and at par with NDM-61, NDM-67 and NDM-51 in 2008-09. The yield variability among the genotypes were not found significant, where as it was significant between genotypes at 30 and 40 ESP level in all three-growing season. The maximum yield was observed in NDM-61 (3.95g) during 2006-07; whereas 2007-08 and 2008-09 NDM-69 gave highest yield 4.13g and 3.90g per plant at 30 ESP level, respectively fenugreek genotypes could release downy mildew resistant variety for commercial cultivation on large scale [12-15].

Application of research: The NDM-69 has been tested at KVK Gonda, Faizabad, Bahraich, Mau and farmers' fields and gave comparatively higher seed yield than Hisar Sonali in all the KVKs. The maximum seed yield was observed at Faizabad (15.80q/ha) and minimum at KVK Mau (14.45q/ha) over the Hisar Sonali (12.10q/ha). At farmers field the seed yield of NDM-69 was found highest 14.56q/ha followed by HM-259 (13.13q/ha), AFg-6 (12.38q/ha) and NDM-72 (12.38q/ha). It is concluded that variety is commercially useful for the farmers because it is high yielding and resistant against downy mildew disease.

Research Category: Plant Pathology

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Study area / Sample Collection: Vegetable farm, Kumarganj

Cultivar / Variety / Breed name: Fenugreek (*Trigonella foenum graecum* L)

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

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