

Effect of foliar sprays of growth regulators on growth and seed yield of methi (*Trigonella foenum-graecum* L.) cv. PUSA EARLY BUNCHING

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ABSTRACT

The present study was conducted to find out which Bioenzyme and plant growth regulators (PGRs) were enhancing the seed yield of Methi. During Rabi season, 2000, plants were sprayed with bioenzymes and PGRs at 25,50 and 75 days after sowing. These fourteen treatments were replicated in three replications. Treatment T₆ (Novazyme 2ml/lt) produced maximum seed yield. It was followed by T₃ (Fulltoss 2ml/lt) and T₂ (Biozyme 2ml/lt). Treatment T₃ (Fulltoss 2ml/lt) recorded early flowering and pod setting.

Key words : Methi, Plant growth regulator (PGR), Biozyme, Yield.

INTRODUCTION

Methi (*Trigonella foenum-graecum* L.) is an important minor seed spice. Plant growth regulator and Biozyme application is important and essential for improving the vegetative growth and yield. Effect of PGRs and Biozymes were studied in various major and minor spices and shown good response. However, it has not been intensively studied in Methi. Sharma (1995) reported that increased fruits per plant due to triacontanol (7.5 ppm) in Tomato. Gulshan Lal and Lal (1998) reported reduced number of days for 50 % flowering in Okara Cv. Pusa Sawani. Looking to the efforts in another crops, it has been found that the PGR's and Bioenzymes are useful for increasing plant height and seed yield of methi. Therefore, the present experiment was designed to study the effect of different PGRs and bioenzymes on growth and yield parameters of methi cv. PUSA EARLY BUNCHING.

MATERIALS AND METHODS

The study was conducted during Rabi season 2000. The details of treatments along with symbols are given below.

S. No.	Symbols	Details of treatment
1	T ₁	NAA 20 ppm
2	T ₂	Biozyme 2 ml/lt
3	T ₃	Fulltoss 2 ml/lt
4	T ₄	Humicil 2 ml/lt
5	T ₅	Multizyme 2 ml/lt
6	T ₆	Novazyme 2 ml/lt
7	T ₇	Novacharge 2 ml/lt
8	T ₈	Plantozyme 2 ml/lt
9	T ₉	Supercropenzyme 2 ml/lt

10	T ₁₀	N-Triacontanol 2 ml/lt
11	T ₁₁	Supercropecharge 2 ml/lt
12	T ₁₂	Shaktizyme 2 ml/lt
13	T ₁₃	Water spray
14	T ₁₄	Control

The treatments were replicated three times in Randomized Block Design. The size of gross sown area was 383.76 Sq.M. and net sown area was 264.6 Sq.M. One set sprayed with distilled water has served as control. The plants were treated with each chemical thrice at 25, 50 and 75 days of sowing as foliar spray. Five plants were selected from each treatment for taking observation plant height, number of branches, number of leaves and spreads of plant (East-West& North –South) number of five plants were recorded at 15 days interval. Mean days required for appearance of flower were recorded for all the treatments from the date of sowing to first flower appeared. After flowering, ten flowers were selected randomly from each plot and labeled and days required for pod setting were recorded, numbers of pods of each observational plant from each plant were counted and from this average number of pods per plant were calculated. Other observations like average length of pod (cm), weight of 100 pods (g), number of seeds per pod, seed yield per plant (g), seed yield per hectare (qts), straw yield per plant (g) and straw yield per hectare (qts) as per parameters recorded.

RESULTS AND DISCUSSION

The data given in table1 showed that the plant height recorded after 90 days of sowing revealed that treatment T₁₀ (N-Triacontanol 2 ml/lt) showed maximum plant height (78.03cm) as compared to other treatments. The

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Table 1 : Vegetative growth and flowering parameters

Treatments	Plant height (cm)	No. of branches	No. of leaves	Spread of Plant		Days required For appearance	Days required For 50 % flowering	Days required For setting of pod	No. of pods per plant at harvest
				E-W	N-S				
T ₁	74.50	5.35	352.17	23.00	23.00	54.50	59.82	5.48	22.33
T ₂	72.33	6.30	314.00	19.40	20.83	54.80	60.02	5.87	26.00
T ₃	77.67	6.72	323.00	19.50	24.67	53.38	58.64	5.17	22.67
T ₄	75.33	6.67	220.50	19.17	23.83	56.80	62.18	6.11	22.67
T ₅	74.83	6.40	289.00	23.83	23.33	55.88	61.28	5.72	25.33
T ₆	71.00	6.17	332.00	19.43	24.33	55.53	60.87	5.47	27.17
T ₇	70.33	5.91	204.83	19.33	20.67	56.46	61.65	5.38	22.31
T ₈	72.17	5.77	201.83	24.33	22.10	55.88	61.02	5.92	23.83
T ₉	76.58	5.90	202.67	19.17	21.17	56.63	61.54	6.27	23.33
T ₁₀	78.03	6.55	290.83	24.33	21.00	55.63	60.92	5.67	23.33
T ₁₁	77.58	6.40	229.67	26.33	25.67	55.63	60.87	5.62	24.00
T ₁₂	76.47	6.78	356.33	20.17	24.63	55.53	60.84	5.51	25.83
T ₁₃	69.67	5.40	200.67	19.40	21.10	58.25	63.72	6.52	22.33
T ₁₄	68.17	5.17	184.33	19.00	20.83	59.13	64.43	6.87	21.00
SE ±	1.89	0.19	21.87	2.36	2.96	0.50	0.72	0.21	1.27
CD at 5 %	5.47	0.55	63.50	6.86	8.58	1.46	2.08	0.60	3.68

result was at par with the treatments T₃ (Fulltoss 2 ml/lit), T₁₁ (Supercropecharge 2 ml/lit), T₉ (Supercropenzyme 2 ml/lit), T₄ (Humicil 2 ml/lit) and T₅ (Multizyme 2 ml/lit). Similar findings had been reported by Doddadini and Panchal (1989) in chilli with Tricontanol and NAA (10 ppm). The results obtained through Tricontanol application in the present investigation are in close conformity with the results obtained by Bhonde *et.al.* (1992) in kharif onion.

Data Presented in table 1 clearly indicated that the treatment T₁₂ (Shaktizyme 2 ml/lit) recorded highest number of branches (6.78) and number of leaves (356.34) as compared to other treatments. The above quoted research findings confirmed the present result of investigation. The data regarding East-West and North-South spread clearly showed that the effect due to applied bioenzymes and growth regulators were statistically not significant.

The application of Fulltoss, Novacharge, Novazyme, and NAA 20 ppm reduced the number of days required for pod setting. Minimum number of days required for pod setting (5.17) observed in Fulltoss(2 ml/lit).(T₃). The treatment Fulltoss 2 ml/lit. (T₃) recorded least number of days (53.38) taken for appearance of first flower, followed by NAA 20 ppm (T₁) and Biozyme 2ml/lit. (T₂) 54.50 and 54.80 days respectively. These bioenzymes and PGR's recorded less number of days for appearance of flower compared to control (59.13). These findings were

supported by Patil *et.al.* (1987) in cabbage. Miniraj and Shanmugavelu (1987) in chillies with triacontanol 2 ppm observed earliness in flowering.

The effect regarding number of days required for 50% flowering indicated that treatment Fulltoss (2 ml/lit).(T₃) recorded minimum number of days (58.64) followed by NAA 20 ppm (T₁) and Biozyme (2 ml/lit)(T₂) 59.82 and 60.02 days respectively. These findings were supported by Desai and Pathak (1965) and Shahine *et.al.*(1992) reported early flowering with GA in methi group. Gulshan Lal and Lal (1998) reported above findings in okra Cv. Pusa Sawani with the treatments of GA₃, NAA and urea.

The application of Fulltoss(2 ml/lit)(T₃) recorded least number of days (5.17) for setting of Pod followed by Novacharge (2 ml/lit)(T₇), Novazyme (2 ml/lit)(T₆), NAA 20ppm Shaktizyme (2 ml/lit)(T₁₂), Supercropecharge (2 ml/lit)(T₁₁), N-triacontanol (2 ml/lit)(T₁₀) and Multizyme (2 ml/lit)(T₅). From table 1 it is observed that the treatment Novazyme (2 ml/lit)(T₆) recorded maximum number of pods (27.17) at the time of harvest followed by Fulltoss 2ml/ lit (26.67), Biozyme 2ml/lit (T₂) (26.00). Shaktizyme (2 ml/lit) (T₁₂), Multizyme (2 ml/lit)(T₅), Supercorpecharge (2 ml/lit) (T₉) and Planstozyme(2 ml/lit) (T₈). These findings were supported by the result obtained by Rao *et. al.* (1990) in chilli. He found increased number of fruits due to NAA, IAA and 2,4-D application; Sharma (1995) reported increased fruits per plant due to Triacontanol

Table 2 : Post harvest parameters

Treatments	Avg.length of Pods (cm)	Avg.wt. of 100Pods (g)	No. of seeds Per pod	Seed Yield		Straw yield	
				Per plant (g)	Per ha.(q)	Per plant (g)	Per ha.(q)
NAA 20 ppm	11.65	30.40	14.00	4.56	15.19	6.76	21.48
Biozyme 2 ml/lt	11.17	32.30	14.48	5.70	19.21	9.59	31.74
Fulltoss 2 ml/lt	11.86	32.80	17.40	5.79	19.35	9.44	29.19
Humicil 2 ml/lt	10.15	30.90	14.00	5.28	17.61	6.86	12.87
Multizyme 2 ml/lt	10.87	31.30	15.10	5.22	17.62	8.37	25.95
Novazyme 2 ml/lt	10.35	32.10	14.50	6.56	21.91	7.15	23.51
Novacharge 2 ml/lt	9.97	29.67	15.10	4.16	13.86	6.39	18.18
Plantozyme 2 ml/lt	9.50	30.94	13.00	4.68	15.59	8.78	27.48
Supercropenzyme 2ml/lt	10.00	31.30	13.30	4.19	13.97	5.32	13.33
N-Triacontanol 2 ml/lt	10.25	31.50	14.30	4.51	15.20	7.88	23.81
Supercropecharge 2ml/lt	10.95	33.40	15.00	4.58	15.27	6.44	21.40
Shaktizyme 2 ml/lt	11.20	33.10	14.80	5.11	17.46	5.45	17.75
Water spray	9.50	29.70	12.90	4.51	15.05	3.63	12.10
Control	9.38	29.48	12.60	4.11	13.58	3.67	12.33
SE ±	0.25	0.41	0.24	0.24	1.28	0.23	1.92
CD at 5 %	0.73	1.20	0.70	0.71	3.71	0.68	5.58

(7.5ppm) in tomato.

The data regarding average length of pod and number of seeds per pod presented in Table 2 clearly indicated that the treatment Fulltoss (2 ml/lt)(T₃) recorded maximum length of pod (11.86) and seeds per pod (17.40). The present's findings were confirmed by Doddamani and Panchal (1989) in chilli.

The treated plants recorded significantly increase in weight of 100 pods as compared to untreated plants. The treatment Supercropecharge 2ml/lt (T₁₁) recorded maximum wt. of hundred pods (33.40) followed by Shaktizyme (2 ml/lt)(T₁₂), Fulltoss(2 ml/lt)(T₃), and Biozyme (2 ml/lt)(T₂). The treatments Novazyme (2 ml/lt)(T₆), N-triacontanol (2 ml/lt)(T₁₀), Multizyme (2 ml/lt)(T₅) and Supercropezyme(2 ml/lt) (T₉) also recorded maximum weight of 100 pods than control (29.48). The application of Novazyme, Fulltoss, Biozyme, Multizyme, Humicil and Shaktizyme at 2ml/lt showed increased seed yields than control (T₁₄). The treatment Novazyme 2ml/lt (T₆) recorded maximum seed yield per plant (6.56 kg) and per ha. (21.90 qt). These findings are supported by Bagade (1993) who reported that IAA at 45 ppm given higher seed yield in methi.

Treatment Biozyme 2 ml/lt (T₂) showed maximum straw yield per plant and per hectare were 9.59 kg and 31.74 qt. respectively. There is very scanty work on horticultural crops relating to effect of Bioenzymes and PGRs on straw yield.

CONCLUSION

From the studies, it appeared that among fourteen treatments applied as commercial Bioenzymes and growth regulators; Novazyme proved superior in respect of seed yield (21.907 qt/ha). It was followed by Fulltoss (19.363 qt/ha) and Biozyme (19.207 qt/ha). Other treatments, which significantly increased yield of seed compared to control were -Multizyme (T₅), humicil (T₄) and shaktizyme (T₁₂). Fulltoss 2 ml/lt (T₃) recorded early in flowering and pod setting.

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