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AK Jawarkar

Chilli and Vegetable Research
Unit, Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

SM Ghawade

Chilli and Vegetable Research
Unit, Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

SV Bhavar

Chilli and Vegetable Research
Unit, Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

VD Tayade

Chilli and Vegetable Research
Unit, Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

Correspondence**AK Jawarkar**

Chilli and Vegetable Research
Unit, Dr. Panjabrao Deshmukh
Krishi Vidyapeeth, Akola,
Maharashtra, India

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Influence of spacing and pinching on leaf yield of kasuri methi (*Trigonella corniculata* L.) under Akola (M.S.) conditions

AK Jawarkar, SM Ghawade, SV Bhavar and VD Tayade

Abstract

The present investigation entitled "Effect of spacing and pinching on leaf yield of kasuri methi (*Trigonella corniculata* L.)" was carried out in the year 2015 - 2016, at Chilli and Vegetables Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola with an objective to study the effect of spacing and pinching on leaf yield of kasuri methi individually, to find out the suitable combination of spacing and pinching on leaf yield of kasuri methi. An experiment was laid out in Factorial Randomized Block Design (FRBD) with eight treatment combinations. There were two factors in an experiment, first being spacing with four levels viz., S₁ (10 x 15 cm), S₂ (15 x 15 cm), S₃ (15 x 30 cm) and S₄ (30 x 30 cm) and another factor of pinching with two levels i.e. P₁ (first pinching at 30 DAS) and P₂ (second pinching at 40 DAS) and replicated thrice to study the spacing and pinching effect on leaves quality and leaves yield of kasuri methi.

Results of the present investigation revealed that, the vegetative growth observations in terms of plant height, branches per plant and number of leaves were increased with wider spacing treatment S₄ (30 x 30 cm) and also subsequent second pinching undertaken at 40 DAS. As regards to the interaction effect of spacing and pinching, the treatment combination S₄P₂ viz., kasuri methi sown at the spacing at 30 x 30 cm and pinched at 40 DAS produced significantly the maximum fresh as well as dry leaves yield per plant, per plot and per hectare, respectively.

Keywords: Spacing, pinching, leaf yield, kasuri methi

Introduction

Kasuri methi (*Trigonella corniculata* L.) is an herbaceous, bushy, slow growing annual spice crop, mainly grown for green herbage as well as dry herb. Dried leaves are used as a spice to add aroma and flavour to the food products. It is important herb spice crop grown as winter season crop in the plains of north India. It is rich source of proteins and minerals especially iron, calcium and vitamins. Kasuri methi has many uses, such as, flavouring and medicinal purpose and it is gaining importance in recent years and has a good demand for its dried leaves in the market. Among the several technical approaches, leaf yield and pinching is practiced to enhance branching, which simultaneously leads to leaf yield and flower bearing. Plant spacing, which affects the plant height, fresh leaves, leaf number etc. Both of these factors are having vital importance in kasuri methi production. But, limited work has been undertaken on these aspects. Keeping all these points in view, the present study was carried out with an objective to know the appropriate planting time and number of pinching to be undertaken under the agro climatic conditions of Akola (M. S.).

Material and Methods

The present investigation was carried out during *rabi* season of 2015-2016, at Chilli Vegetable Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment was designed in a Factorial Randomized Block Design (FRBD). There were eight treatments combinations and each treatment was replicated thrice with a plot size 2m x 3m per treatment. There were two factors in that, first factor spacing comprised with four levels i.e. 10 x 15 cm, 15x15 cm, 30x15 cm, 30x30 cm and another factor with two different levels of pinching i.e. pinching at 30 days after sowing and 40 days after sowing. The plots were kept free from weeds by hand weeding at 15, 30 and 40 days after sowing. Irrigations were given at an interval of 4-5 days during the whole cropping period depending on the soil moisture conditions.

In order to evaluate the effect of different treatments on growth and yield of crop, necessary periodical observations were recorded and the recorded data was statistically analyzed by ANOVA method given by Panse and Sukhatme (1995).

Treatment combinations

S. No.	Treatments	Treatment details
1	S ₁ P ₁	Spacing at 10×15 cm and Pinching at 30DAS
2	S ₂ P ₁	Spacing at 15×15 cm and Pinching at 30DAS
3	S ₃ P ₁	Spacing at 30×15 cm and Pinching at 30DAS
4	S ₄ P ₁	Spacing at 30×30 cm and Pinching at 30DAS
5	S ₁ P ₂	Spacing at 10×15 cm and Pinching at 40DAS
6	S ₂ P ₂	Spacing at 15×15 cm and Pinching at 40DAS
7	S ₃ P ₂	Spacing at 30×15 cm and Pinching at 40DAS
8	S ₄ P ₂	Spacing at 30×30 cm and Pinching at 40DAS

Results and Discussions

Effect of spacing levels

It was observed from the data pertaining to Table 1 that, spacing significantly influenced different growth parameters viz., plant height, number of branches, number of leaves, fresh and dry leaf yield of plant. Significantly the maximum plant height was at 30, 40, and 50 DAS (9.50 cm, 12.88 cm and 16.62 cm, respectively) was attained by spacing treatment 30 cm x 30cm. Significant increase in plant height from early stage of crop growth under the wider spacing might be due to the fact that, more spacing provide less competition between plants for sunlight, nutrient, water etc. as compared to other treatment, which might be resulted into better growth and development of plant with wider spacing treatment S₄. These findings are in conformity with the results reported by Singh *et al.* (2005) [6] and Tiwari (2016) [8] in fenugreek.

As far as the effect of spacing on number of branches were concerned it revealed that, crop raised under spacing treatment 30 x 30 cm recorded significantly the maximum number of branches at 30, 40 and 50 DAS (5.32, 7.52 and 9.71, respectively). However, significantly the maximum number of leaves were observed at an interval of 30, 40 and 50 DAS (12.24, 30.78 and 49.28, respectively) significant improvement in aforesaid parameters due to increase in spacing or in other words reduction in plant population per unit area could be ascribed to availability of more area per plant. Which implied that, individual plant at wider spacing received higher growth inputs (sunlight, water and nutrients) also such plant has least competition compared to the plant grown under wider spacing treatment. The similar results were recorded by the Anupama G. (2012) [1] in kasuri methi, Mohamed (1990) [4] and Tiwari (2016) [8] in fenugreek.

It was also observed from the Table 2 in respect of fresh and dry leaf yield of kasuri methi that, at different spacing treatment 30 x 30 cm significantly affects the various yield attributes i.e. maximum fresh leaf yield per plot (10.13 kg) and per hectare (168.8 q.). Significantly the maximum 1.99 kg/plot and 33.20 q/ha dried leaf yield of kasuri methi with highest spacing (30 x 30 cm) were obtained in the present study. The marked improvement in yield and it's attributes of kasuri methi with increased spacing appears to be on account of vigorous and profuse branching with more biomass accumulation per plant. Furthermore, drying of harvested fresh leaves of every treatment was undertaken with the help of blanching and sun drying which, probably doesn't have any external influence of any factor and therefore, it reflects in the form of proportion only. The similar trend of change in dry weight was recorded by Anupama G. (2012) [1] in kasuri methi, Deswal (2014) [2] and Rana (2015) [5] in fenugreek.

Table 1: Influence of spacing and pinching on different growth parameters of kasuri methi (*Trigonella corniculata* L.)

Treatment	Plant height (cm)			Number of branches			Number of leaves		
	30 DAS	40 DAS	50 DAS	30 DAS	40 DAS	50 DAS	30 DAS	40 DAS	50 DAS
Spacing (S)									
S ₁ (10 x 15 cms)	6.75	8.62	10.46	3.52	5.28	7.03	10.48	25.10	41.00
S ₂ (15 x 15 cms)	7.61	10.85	14.11	4.51	6.65	8.78	11.26	28.07	45.05
S ₃ (15 x 30 cms)	8.35	11.92	15.47	4.65	6.84	9.00	11.85	28.35	45.83
S ₄ (30 x 30 cms)	9.50	12.88	16.62	5.32	7.52	9.71	12.24	30.78	49.28
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
SE(m)±	0.19	0.15	0.21	0.09	0.13	0.21	0.142	0.33	0.58
CD at 5%	0.58	0.46	0.67	0.29	0.38	0.63	0.436	0.99	1.76
Pinching (P)									
P ₁ (First pinching)	7.79	10.67	13.73	4.26	6.21	8.16	11.29	27.41	44.12
P ₂ (Second pinching)	8.33	11.47	14.60	4.74	6.93	9.12	11.63	28.74	46.46
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
SE(m)±	0.13	0.11	0.15	0.07	0.09	0.15	0.10	0.23	0.40
CD at 5%	0.41	0.33	0.47	0.21	0.27	0.45	0.31	0.71	1.24
Interaction (S×P)									
'F' test	NS	NS	NS	NS	NS	NS	NS	NS	NS
SE(m)±	0.26	0.21	0.30	0.14	0.18	0.29	0.20	0.46	0.81
CD at 5%	-	-	-	-	-	-	-	-	-

Effect of pinching levels

It is evident from the data presented in Table 1 that, plant height, number of branches per plant, number of leaves per plant at 30, 40 and 50 DAS showed significant differences in respect to time of pinching. Significantly, the maximum (8.33 cm, 11.47 cm and 14.60 cm) plant height, the maximum (4.74, 6.93 and 9.12) number of branches and significantly the maximum (11.63, 28.74 and 46.46) number of leaves respectively were produced at second pinching.

This might be due to the fact that, second pinching at 40 DAS would provide the sufficient time for regeneration of vegetative parts and enhance growth of other plant parts by maintaining source sink relationship of nutrients. Pinching back of growing tips, which might be helpful to regeneration of new flush and restriction to vertical growth initially on account of effective translocation of hormones, particularly auxins, which are being diverted to the tertiary shoots buds, contrarily under normal conditions it remains dormant than when it was undertaken at first pinching. These results are in

conformity with the findings of Tehlan and Thakral (2008) ^[7] in coriander, Vasudevan *et al.* (2008) ^[9] and Krishnaveni *et al.* (2014) ^[3] in fenugreek.

Table 2: Effect of spacing and pinching on yield of kasuri methi (*Trigonella corniculata* L.)

Treatment	Fresh leaf yield		Dry leaf yield	
	Per plot (kg)	Per hectare (q)	Per plot (kg)	Per hectare (q)
Spacing				
S ₁ (10 x 15 cms)	5.65	94.1	1.12	18.543
S ₂ (15 x 15 cms)	6.56	109.3	1.29	21.45
S ₃ (15 x 30 cms)	8.58	143.0	1.69	28.20
S ₄ (30 x 30 cms)	10.13	168.8	1.99	33.20
'F' test	Sig.	Sig.	Sig.	Sig.
SE(m) _±	0.02	0.29	0.003	0.06
CD at 5%	0.05	0.90	0.01	0.18
Pinching				
P ₁ (First pinching)	88.2	122.4	1.45	24.15
P ₂ (Second pinching)	97.3	135.1	1.59	26.54
'F' test	Sig.	Sig.	Sig.	Sig.
SE(m) _±	0.01	0.21	0.01	0.04
CD at 5%	0.04	0.64	0.01	0.12
Interaction				
S ₁ P ₁	15.3	85.00	1.02	16.97
S ₂ P ₁	18.7	103.83	1.26	20.98
S ₃ P ₁	24.9	138.33	1.65	27.60
S ₄ P ₁	29.3	162.53	1.86	31.05
S ₁ P ₂	18.6	103.17	1.21	20.12
S ₂ P ₂	20.7	114.77	1.31	21.91
S ₃ P ₂	26.6	147.67	1.73	28.79
S ₄ P ₂	31.5	174.97	2.12	35.34
'F' test	Sig.	Sig.	Sig.	Sig.
SE(m) _±	0.03	0.42	0.01	0.08
CD at 5%	0.08	1.27	0.02	0.25

Conclusion

From the one year experimentation, it could be concluded that, the growth parameter such as plant height, number of branches and number of leaves were significantly increased at wider spacing (30 x 30 cm) and pinching at 40 DAS. Further it also subsequently increased its leaf yield in respect of fresh as well as dried form were observed with similar trend. There is scope to undertake this study for more years for confirmation of the results obtained in present study.

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