



E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 428-429
Received: 16-07-2018
Accepted: 18-08-2018

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Effect of different plant geometry on growth and yield of sesame (*Sesamum Indicum* L.) during post monsoon season in Marathwada region of Maharashtra

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Abstract

A field experiment was conducted at College of Agriculture, Parbhani (Maharashtra) during post monsoon season 2017 on sesame (*Sesamum indicum* L.) to analyze the growth and yield of sesame in relation to varieties (Phule Til-1, AKT-64, JLT-408) and spacing (30 x 10 cm, 45 x 10 cm, 60 x 10 cm and 45 x 15 cm). The results revealed that the variety JLT-408 recorded highest grain yield (391 kg ha⁻¹) which was found superior over varieties Phule Til-1 and AKT-64. Spacing 30 x 10 cm (412 kg ha⁻¹) produced higher grain yield and it was found significantly superior over rest of the spacing.

Keywords: Varieties, spacing

Introduction

Sesamum indicum L. popularly known as sesame is one of the most important oilseed crops produced in India. It is an important *kharif* crop mainly cultivated in Rajasthan, Maharashtra, Gujarat, M. P., Karnataka, U. P., West Bengal, Orissa and Punjab. It is rich in oil content (50 per cent) and protein (18-20 per cent). The yields of sesame are generally low due to use of low yielding varieties with poor agronomic management practice such as inadequate plant stand. Yield variations in crop are mostly brought due to genetic makeup, growing season and population density. To find out effect of plant geometry becomes an important management practice in order to get maximum yield. The present paper deals with the effect of different plant geometry on growth and yield of sesame.

Materials and Methods

A field experiment was conducted during the post monsoon season 2017 at the Experimental Farm, College of Agriculture, Parbhani (Maharashtra) in split plot design replicated thrice with three varieties (Phule Til-1, AKT-64 and JLT-408) and spacings (30 x 10 cm, 45 x 10 cm, 60 x 10 cm and 45 x 15 cm). The soil of experimental field was clayey with low available nitrogen, medium in available P ha⁻¹. The field operations were done as per crop recommendations. The growth and yield attributes, yield were recorded timely.

Results and Discussion**Growth attributes**

The data (Table 1) indicated that the narrow spacing (30 x 10 cm) produced taller plants than other treatments of spacing indicating competition. Rao *et al.* (1985) [4] reported that narrow spacing produced tallest sesame plants. The wider spacing 45 x 15 cm produced the maximum number of branches plant⁻¹ and was at par with the spacing 60 x 10 cm. Wider spacings were found to be significantly effective in increasing branching pattern than the narrow row spacings 30 x 10 cm, 45 x 10 cm and also 60 x 10 cm. These results were also in conformity with the results reported by Chimanshette and Dhoble (1992) [1] and Subramaniyan *et al.* (2001) [5]. The number of capsules progressively increased with increasing spacing. The wider spacing i.e. 45 x 15 cm recorded more mean number of capsules per plant and was at par with 60 x 10 cm. These two spacings were found to be significantly effective in increasing capsules than the narrow row spacings 30 x 10 cm and 45 x 10 cm. Similar results were also reported by Naim *et al.* (2010). The yield contributing characters *viz.*, weight of seed per plant and number of seeds per capsules were more in the treatment 45 x 15 cm spacing and this spacing was at par with 60 x 10 cm because number of capsules were more in these treatments than the other treatments tried i.e. 30 x 10 cm and 45 x 10 cm.

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Table 1: An extract of growth contributing characters in sesame crop recorded at different growth period

Character		30 DAS	45 DAS	60 DAS	75 DAS	At harvest
Plant height (cm)	Absolute	11.85	34.75	50.18	54.32	56.20
	% of maximum	21.08	61.83	89.28	96.65	100
Number of functional leaves plant ⁻¹	Absolute	17.97	37.85	49.93	55.87	13.99
	% of maximum	32.16	67.74	89.36	100	25.04
Leaf area plant ⁻¹ (dm ²)	Absolute	3.65	12.06	14.17	13.41	4.88
	% of maximum	25.75	85.10	100	94.63	34.43
Number of branches plant ⁻¹	Absolute	-	2.31	3.04	3.44	3.44
	% of maximum	-	67.15	88.37	100	100
Total dry matter plant ⁻¹ (g)	Absolute	1.61	6.30	10.17	13.22	13.92
	% of maximum	11.56	45.25	73.06	94.97	100
Number of capsules plant ⁻¹	Absolute	-	-	15.91	19.62	21.40
	% of maximum	-	-	74.34	91.68	100

Yield attributes

The data presented in Table 2 show that the narrow row spacing 30 x 10 cm was found significantly superior over the spacing of 45 x 10 cm, 60 x 10 cm and 45 x 15 cm in recording higher seed yield. Through number of branches and number of capsules were maximum in wider spacing, it could not compensate the yield loss because of less plant population

observed in wider spacing. These results are in agreement with the results reported by Rao et al. (1985)^[4] and Patra and Mishra. (2000)^[3]. Hence, from the above results it can be concluded that the sesame genotype JLT-408 can be grown at 30 x 10 cm spacing for higher seed yield during post monsoon season.

Table 2: Seed yield (kg ha⁻¹), straw yield (kg ha⁻¹), biological yield (kg ha⁻¹) and harvest index (%) of sesame crop as influenced by different treatments

Treatment	Seed yield (kg ha ⁻¹)	Straw yield (kg ha ⁻¹)	Biological yield (kg ha ⁻¹)	Harvest index (%)
A. Varieties				
V ₁ - Phule Til-1	315	903.09	1218.09	25.86
V ₂ - AKT-64	356	1009.03	1365.03	26.08
V ₃ - JLT-408	391	1082.24	1473.24	26.54
SE(m)±	10.06	25.98	41.50	-
CD at 5%	39.51	100.57	164.35	-
B. Spacings				
S ₁ - 30 x 10 cm ²	412	1135.09	1547.09	26.63
S ₂ - 45 x 10 cm ²	369	1022.13	1391.13	26.52
S ₃ - 60 x 10 cm ²	329	935.65	1264.66	26.01
S ₄ - 45 x 15 cm ²	306	899.61	1205.61	25.38
SE(m)±	12.96	17.84	37.11	-
CD at 5%	37.87	53.01	108.76	-
Interaction				
V x S				
SE(m)±	22.08	30.90	63.40	-
CD at 5%	NS	NS	NS	-
GM	354	998.12	1352.12	26.16

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