

Response of sesame (*Sesamum indicum*) genotypes to levels of nutrients and spacing under different seasons

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ABSTRACT

A field experiment was conducted to study the response of 2 cultivars ('TMV 3' and 'TMV 4') of sesame (*Sesamum indicum* L.) to different spacings and fertilizer levels in sandy-loam soil during the rainy and summer seasons of 1996 and 1997. The variety 'TMV 4' registered the tallest plant in both the seasons and it produced the maximum dry matter. Closer spacing (30 cm × 30 cm) and highest level of nutrients recorded maximum dry matter during summer season. Variety 'TMV 4' recorded the mean seed yield of 723 kg/ha and 1,273 during the rainy season and summer season respectively. Fertilizers of 150% of recommended level resulted in significantly higher (1,522 kg/ha) seed yield during summer than lower level; but it was on a par with recommended level of fertilizer during the rainy season.

Key words : Sesame cultivars, Seasons, Spacing, Fertilizer levels, Seed yield

Cultivars of sesame perform differently during different seasons. Based on the morphological characters and branching habit of the cultivar, it requires an appropriate spacing for economic yield. There is differential response of the cultivars to higher levels of nutrients during different seasons due to variation in hours of solar radiation (Subramanian *et al.*, 1979). Hence it is necessary to evaluate the varieties for their performance with reference to the season, spacing and fertilizer levels for optimization.

MATERIALS AND METHODS

A field experiment was conducted

during the rainy and summer seasons of 1996 and 1997 with 2 cultivars of sesame. The soil was sandy loam in texture and neutral in reaction, having 132, 13.9 and 127.8 kg/ha of N, P and K respectively. Two varieties 'TMV 3' and 'TMV 4' were grown spacing of 30 cm × 30 cm, 30 cm × 40 cm and 30 cm × 45 cm to have 11, 8 and 7 plants/m² area. Six combinations of varieties and spacing were taken in the main plot and 3 fertilizer levels, viz. control, 100% recommended N:P:K (35:23:23 kg/ha) and 150% recommended N:P:K (52:35:35 kg/ha) were allotted to the subplot. Gypsum @ 200 kg/ha applied uniformly to all the treatments. Half the

dose of N, full dose of P and K were applied basal and remaining N was in 2 equal splits, 25 and 40 days after sowing. The experimental design was split plot, replicated thrice. Sowing was taken on 12 February 1996 and 14 February 1997 and harvesting was done on 11 May 1996 and 13 May 1997 in the respective years.

RESULTS AND DISCUSSION

The effects of treatment on sesame growth, yield attributes and seed yield are presented in the Tables 1 and 2.

Growth and yield attributes

Among the varieties, 'TMV 4' had significantly tallest in both the seasons. Dry matter was also higher the same variety. Closer spacing (30 cm × 30 cm) produced

the tallest plants compared with wider spacing. Similar trend was also observed in recording the dry matter. The maximum dry matter was recorded by 30 cm × 30 cm spacing during the summer season.

The 150% recommended level of nutrients had the tallest plant, recording 119.5 and 113.7 cm height during rainy and summer seasons respectively. The maximum dry matter was recorded during the summer season by 150% recommended level of nutrients. Suryaprakasa Rao and Venkatachari (1979) reported that less number of sunshine hour per day might be the season for low dry matter during the rainy season.

'TMV 4' sesame produced more capsules than 'TMV 3'. Under wider spacing (30 cm × 45 cm) more number of capsules were recorded during summer and

Table 1. Effect of variety, spacing and fertilizer level on plant height and dry-matter accumulation at harvest (mean data of 2 years)

Treatment	Rainy season		Summer season	
	Plant height (cm)	Dry matter (kg/ha)	Plant height (cm)	Dry matter
<i>Variety</i>				
'TMV 3'	92.3	3,494	108.8	5,742
'TMV 4'	100.9	3,782	114.1	5,866
CD (P=0.05)	3.8	93.4	5.6	96.5
<i>Spacing</i>				
30 cm × 30 cm	115.1	3,404	110.0	5,916
30 cm × 40 cm	112.7	2,791	108.1	5,540
30 cm × 45 cm	111.5	2,365	107.0	5,072
CD (P=0.05)	1.7	93.7	1.07	219.8
<i>Fertilizer</i>				
Control	103.4	2,107	103.9	3,469
100% recommended dose	116.4	3,905	107.5	6,042
150% of recommended dose	119.5	4,279	113.7	6,989
CD (P=0.05)	2.3	419.5	1.72	254.7

spacing of 30 cm × 40 cm during the rainy season. 'TMV 4' receiving 150% recommended fertilizer showed more capsules/plant than other treatments. Seeds/capsule were increased in summer season and the maximum number of seeds (73)/capsule were recorded by 'TMV 4'. The seed weight did not show change due to seasons in both the varieties and under different population during the rainy season. But during summer season, wider spacing resulted in significantly more weight than closer spacing. Irrespective of the season, the higher level of fertilizer significantly increased the 1,000-seed weight.

Seed yield

Both the varieties yielded better during summer than the rainy season. The mean increase in seed yield during summer season was 47.0% in 'TMV 3' and 76.0% in 'TMV 4'. The probable reason for higher yield during the summer might be attributed to the availability of ample solar radiation in the tropical climate (Subramanian *et al.*, 1979). Closer spacing (30 cm × 30 cm) gave significantly higher seed yield in sesame. Parasuraman (1994) reported significant increase in the yield attributes and seed yield under 111,000 plants/ha. During the rainy season 100% recommen-

Table 2. Effect of variety, spacing and fertilizer level on yield attributes and yield of sesame (mean data of 2 years)

Treatment	Rainy season			Summer Season			Seed yield (kg/ha)	
	Capsules/ plant	Seeds/ capsule	1,000- seed weight (g)	Capsules/ plant	Seeds/ capsule	1,000- seed weight (g)	Kharif	Summer
<i>Variety</i>								
'TMV 3'	68	58	3.0	97	70	3.0	664.0	976.5
'TMV 4'	80	66	3.0	103	73	3.1	723.0	1,273.0
CD (P=0.05)	1.6	2.4	NS	2.5	2.2	NS	27.6	69.4
<i>Spacing (cm)</i>								
30 cm × 30 cm	74	65	2.9	102	67	2.9	719.5	1,306.5
30 cm × 40 cm	77	67	2.9	107	68	3.0	571.5	1,216.5
30 cm × 45 cm	75	66	2.9	111	68	3.0	488.5	1,120.0
CD (P=0.05)	2.3	1.0	NS	3.9	NS	0.03	22.5	53.1
<i>Fertilizer</i>								
Control	45	57	2.6	85	63	2.8	353.0	784.5
100% of recommended dose	87	67	3.0	105	69	3.0	679.5	1,335.0
150% of recommended dose	92	70	3.1	125	72	3.0	747.0	1,522.5
CD (P=0.05)	8.5	1.6	0.03	2.4	0.5	0.17	353.0	784.5

ded fertilizer level registered the seed yield on par with higher level. But during the summer season 150% of recommended level gave significantly higher seed yield than 100% recommended level. Kanade *et al.* (1992) reported that the seed yield of sesame was doubled by the application of 50 and 25 kg N and P/ha through enhancing the yield traits over half of the above levels during the summer season. Low seed yield was registered during the rainy season under sandy-loam soil by Arunachalam (1989). Results showed that high seed yield was obtained during the summer under closer spacing with 150% of recommended level of fertilizer.

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