

EFFECT OF PLANTING DATES AND POPULATION LEVELS ON THE YIELD OF SESAMUM (*Sesamum indicum* L.)

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To find out the effect of sowing dates and plant population on the yield of sesamum, field experiments were conducted over a period of three years from 1980-81 to 1982-83 in the Tamil Nadu Agricultural University farm at Coimbatore. The results showed that early sowing *viz.*, immediately after the onset of monsoon was superior over the rest of planting dates. Among the different population levels, two lakh plants per hectare (30x15 cm) recorded higher yields than the other population levels in all the three years of experimentation.

Sesamum is one of the major oilseed crops in India. The average yield of sesamum in India is very low (234 kg/ha) compared to world average of 660 kg/ha. It is generally raised in sandy and loam soils that are poor in organic matter without adequate fertilization. Scope to increase yields by adopting proper spacing and judicious fertilization in sesame has earlier been reported by Seshadri (1957). Optimum plant density with adequate nutrient supply at the appropriate time of the crop growth ensures optimum yield in any crop plant.

MATERIALS AND METHODS

The experiments were conducted during *kharif* seasons of 1980-81, 1981-82 and 1982-83 in the Tamil Nadu Agricultural University farm at Coimbatore. The design adopted was split plot with three replications. The main plot treatments were the dates of sowing and the combination of population levels and varieties

were in the sub plot treatments. There were four dates of sowing in the first year of trial and three in the second and third years. The sowing dates were *viz.*, 14.7.80 (D_1), 21.7.80 (D_2), 28.7.80 (D_3) and 4.8.80 (D_4) during 1980-81; 26.8.81 (D_1), 8.9.81 (D_2) and 14.9.81 (D_3) in 1981-82 and 3.8.82 (D_1), 16.8.82 (D_2) and 30.8.82 (D_3) in 1982-83. There were two population levels in the first and second years *viz.*, 2 lakh plant population per hectare (S_1) and 3 lakh plant population per hectare (S_2) and three population levels in the third year *viz.*, 2 lakh plant population per hectare (S_1), 3 lakh plant population per hectare (S_2) and 4 lakh plant population per hectare (S_3). The varieties were TC 25 (V_1), and TMV₃ (V_2), in 1980-81 and in the last two years varieties tried were TMV 3 (V_1) and CO 1 (V_2). Thus there were a total of 16, 12 and 18 treatment combinations in 1980-81, 1981-82 and 1982-83 seasons respectively. A common

fertilizer dose of 15:20:20 NPK kg/ha was applied uniformly to all the plots as basal. The balance of 15 kg N/ha was applied on the 30th day after sowing. All intercultural operations were done at the appropriate period. Harvesting was done

carefully at the correct stage of maturity in all the treatments and the produce was cleaned, dried and weighed. The mean yield data obtained in all the three years are presented in the table. 1.

Table 1. Effect of planting dates and population levels on the mean yield in sesamum (kg/ha)

Treatments	1980-81	1981-82	1982-83
D ₁ S ₁ V ₁	90	261	365
D ₁ S ₂ V ₁	92	148	266
D ₁ S ₃ V ₁	—	—	256
D ₁ S ₁ V ₂	285	284	378
D ₁ S ₂ V ₂	187	155	217
D ₁ S ₃ V ₂	—	—	189
D ₂ S ₁ V ₁	148	93	309
D ₂ S ₂ V ₁	99	95	250
D ₂ S ₃ V ₁	—	—	217
D ₂ S ₁ V ₂	176	119	229
D ₂ S ₂ V ₂	168	134	212
D ₂ S ₃ V ₂	—	—	191
D ₃ S ₁ V ₁	98	99	194
D ₃ S ₂ V ₁	123	93	142
D ₃ S ₃ V ₁	—	—	142
D ₃ S ₁ V ₂	96	39	204
D ₃ S ₂ V ₂	234	64	154
D ₃ S ₃ V ₂	—	—	142
D ₄ S ₁ V ₁	142	—	—
D ₄ S ₂ V ₁	134	—	—
D ₄ S ₃ V ₁	—	—	—
D ₄ S ₁ V ₂	193	—	—
D ₄ S ₂ V ₂	204	—	—
D ₄ S ₃ V ₂	—	—	—
	Not significant	Significant	Not significant

	1981-82		1982-83	
	S.E.	C.D.	S.E.	C.D.
Planting date	.76	22.78	17.06	38.01
Plant population	6.34	18.60	9.13	18.84

S₁ = 2 Lakhs/ha; S₂ = 3 Lakhs/ha; S₃ = 4 Lakhs/ha
 V₁ = TC 25; (1980-81) V₁ = TMV 3 (1981-82 and 1982-83)
 V₂ = TMV 3 (1980-81) V₂ = CO 1 (1981-82 and 1982-83)

D_1 = Early planting immediately after the onset of monsoon

D_2 = Five to fifteen days after the first sowing

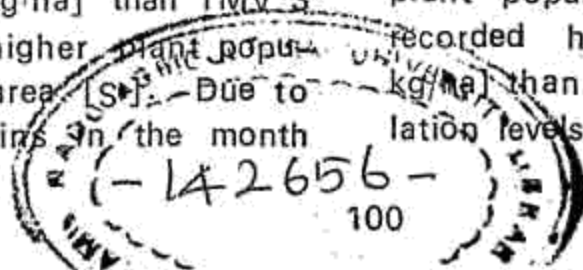
D_3 = Five to fifteen days after the second sowing

Planting dates	Mean yield (kg/ha)					
	1980-81		1981-82		1982-83	
D_1 (14-7-80; 26-8-81; 3-8-82)	163		212		278	
D_2 (21-7-80; 8-9-81; 16-8-82)	148		110		235	
D_3 (28-7-80; 14-9-81; 30-8-82)	163		74		163	
<u>Population levels</u>						
S_1 (2 lakhs/ha)	166		149		279	
S_2 (3 lakhs/ha)	155		115		206	
S_3 (4 lakhs/ha)	=		=		189	
<u>Varieties</u>	V_1	V_2	V_1	V_2	V_1	V_2
	(TC 25)	(TMV 3)	(TMV 3)	(CO 1)	(TMV 3)	(CO 1)
S_1 (2 lakhs/ha)	119	212	151	147	289	270
S_2 (3 lakhs/ha)	112	198	112	118	219	194
S_3 (4 lakhs/ha)	=	=	=	=	205	174

RESULTS AND DISCUSSION

The date of planting did not cause any significant yield differences during 1980-81 (Table 1.) Among the varieties, TMV 3 (V_2) recorded higher yield than TC 25 (V_1) with both the plant populations during 1980-81. Among the different dates of sowing early planting (D_1) recorded significantly higher yield [212 kg/ha] than the other two dates of sowing, D_2 and D_3 , which recorded 110 and 74 kg/ha respectively. The two lakh plant population per hectare [S_1] gave increase in seed yield in both the varieties compared to three lakh plant population per hectare [S_2]. The variety CO 1 [V_2] recorded higher seed yield [118 kg/ha] than TMV 3 [V_1] under the higher plant population per unit area [S_2]. Due to the continuous rains in the month

of September, the crop suffered due to the excess moisture as the timely weeding could not be done to the crop which resulted in the low yields. During 1982-83 season also, the same trend in the yield was noticed. The yield differences in the various treatments was found to be significant. Early planting [D_1] recorded significantly higher seed yield of 278 kg/ha. Again TMV 3 variety [V_1] gave higher seed yield [289 kg/ha] as compared to the CO 1 [V_2] which recorded 270 kg/ha at two lakhs plant population/ha. During this year TMV 3 [V_1] was found to be superior over CO 1 [V_2] irrespective of the planting dates. Two lakh plant population per hectare [S_1] recorded higher seed yield [279 kg/ha] than the higher plant population levels [S_2 and S_3]. There was



gradual yield reduction as the sowing was delayed further from the time of the onset of the monsoon except during 1980-81 where the early sowing was started as early as July 14 [D₁]. Delayed sowing i.e. on August 4, [D₂] recorded 168 kg/ha of seed yield which was slightly higher than the planting done at the start of the onset of monsoon [D₁] which gave only 163 kg/ha. Two lakh plant population per hectare [S₁] recorded higher yield in both the varieties in all the three years of experimentation. The yield was reduced further as the population level was increased from 2 lakhs [S₁] to three lakhs per hectare [S₂] and again the reduction in yield was found to continue even upto the four lakhs plant population per hectare [S₃] during 1982-83. The results of the experiments revealed that early sowing [D₁] i.e. planting immediately after the onset of monsoon with two lakh plant population per hectare [S₁] was found to be the optimum for getting higher yields in sesamum. The results of the present investigation were in agreement with the findings of Daulay and Singh [1982] who had reported that the highest seed yield of sesamum was obtained at 2.50 lakh plant population per hectare at 60 kg N/ha. These results are in line with the findings of Surajbhan and Singh [1973] and Gowda [1974]. The low yield recorded when the planting was delayed beyond the start of the monsoon was attributable to the fact

that late sowings in *kharif* season would result in the low yield. Also the period lapsed between the onset of monsoon and actual sowing, for want of optimum soil moisture conditions and resources of sowing caused further reduction in yield. The low yield at the higher plant population levels was due to the poor photosynthetic activity on account of shading effect at closer spacing and increased nitrogen levels (Arunachalam, 1976).

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