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Short Note

Influence of Time of Sowing and Spacing on Growth and Yield Attributes of Sesame (KS95010)

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A Field experiment was conducted during summer season (2006) to fix the optimum time of sowing and spacing for realizing higher seed yield in sesame. The experiment was laid out in randomized block design (RBD) with six replications. The treatments consisted of two factors: (i) time of sowing (second fortnight of February and first fortnight of March) and (ii) crop geometries (30 x 30 cm, 45 x 15 cm, 30 x 10 cm and 15 x 10 cm). The results of the experiment was revealed that performance of sesame variety KS 95010 was superior when sown early during the second fortnight of February (*Masipattam*) in the rectangular geometry of 45 x 15 cm under irrigated condition in the *Cauvery* delta zone.

Key words: Sesame, dates of sowing, geometry, yield attributes, yield, oil content.

Sesame (*Sesamum indicum* L.) commonly known as til is one of the important oilseed crops in india. It is the oldest oilseed crop known and cultivated by man. Among the oilseed crops, sesame has the highest oil content of 46-64 per cent and 6355 K cal kg^{-1} dietary energy in seeds (Sanjay Kumar and Goel, 1994). Sesame oil with 85 per cent unsaturated fatty acid is highly stable and has reducing effect on cholesterol and prevents coronary heart disease. Hence, sesame is called as the “Queen of oil seeds” by virtue of its excellent quality and utility. The acclimatization and suitability of a particular variety depends upon the agro-climatic condition of the particular region and zone (Balasubramaniyan *et al*.1996). Karaikal region is situated in the tail end of *Cauvery* delta zone. Sesame is one of the important crop included in the cropping system of this region as rice-fallow crop. Selection of suitable variety, time of sowing, appropriate geometry and agronomic technologies are paramount importance for increasing the productivity of sesame in this region.

Materials and Methods

A field experiment was conducted in 2006 during summer season (February, March: *Masipattam)* at experimental farm of the Department of Agronomy, Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal. The experiment was laid out in a randomized block design with six replications. The soil of the experimental field was sandy loam in texture with a pH of 7.4 , EC of 0.23 dSm$^{-1,}$ the fertility status of the soil was low in available nitrogen (216 kg ha^{-1}), medium in available phosphorous (14 kg ha^{-1}) and medium in available potassium (144 kg ha^{-1}). The treatment details were factor I - Time of sowing T1 = II Fortnight of February, T_2 = I Fortnight of March and factor II - Crop geometries G_1 = 30 X 30 cm, G_2 = 45 X 15 cm , G_3 = 30 X 10 cm, G_4 =15 X 10 cm. The experiment was conducted with KS95010 as test variety with a fertilizer dose of 35:23:23 kg NPK ha^{-1}. All the package of practices recommended for irrigated sesame was follwed.

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Results and Discussion

Growth and yield attributes

The plant height at harvest stage had shown unequivocally a significant difference between the two different time of sowings by registering the tallest plants when sown during the second fortnight of February (T_1) than delayed sowing at the first fortnight of March (T_2) during summer season of 96.7 cm. Delayed sowing at the first fortnight of March registered shortest plant height. This may be due to the congenial climatic condition prevailed from its early growth stage which might have helped the plants to put forth enhanced rate of growth and development. A similar finding was reported earlier by Muthusankaranarayanan et *al*. (2001).

Among the four geometry levels tried, sowing of sesame at wider spacing of 45 x 15 cm (G_2) had significantly taller plants of 108.4 cm at harvest stage of observations (Table 1). The wider geometry might have provided sufficient rooting and moisture extraction pattern to the optimum plant population (14 m^{-2}) which in turn would have helped better absorption of water and nutrients from the soil resulting in taller plants during both the years.

Early sowing helped the sesame plants to achieve higher LAI as compared to delayed sowing. The highest leaf area index was observed under closer spacing of 15 x 10 cm (G_4) at 60 DAS (2.21

Table 1. Influence of time of sowing and geometry on growth and yield attributes and yield at harvest stage of sesame

Treatment	Plant height (cm)	LAI (cm)(60 DAS)	DMP (kg/ha)	No.of primary branches	No.of secondary branches	Capsules/ m^2	No. of seeds / capsule	Seed yield (kg/ha)
G_1- 30X30cm	99.9	2.05	2901	6.7	13.2	687	51.1	800
G_2- 45X15cm	108.4	2.11	3133	7.7	15.4	704	53.1	908
G_3- 30X10cm	93.6	2.17	3343	5.0	9.7	611	48.4	637
G_4- 15X10cm	74.2	2.21	3409	3.0	6.2	558	47.7	548
SEd	1.33	0.10	53	0.2	0.4	8	0.3	27
CD(P=0.05)	2.70	0.20	109	0.4	0.8	16	0.7	54
T_1-II fortnight of February	96.7	2.15	3238	6.2	11.5	656	50.3	760
T_2-I fortnight of March	91.3	2.12	3155	5.8	10.7	624	50.1	687
SEd	0.94	0.01	38	0.1	0.2	5	0.24	19
CD(P=0.05)	1.9	0.02	77	0.2	0.6	11	NS	39

cm). The increase in LAI under closer spacing throughout the growth period was due to more number of leaves per unit area which in turn was due to increased number of plants per unit area.These results are in accordance with the findings of Ghosh and Patra (1994). Sowing of sesame, at second fortnight of February *i.e.* (26th February) had more dry matter accumulation during summer season than the delayed sowing.

Closer spacing of 15 x 10 cm was found superior in terms of dry matter accumulation over remaining geometries at harvest stage. However, at harvest stage, both 15 x 10 cm and 30 x 10 performed equally on influencing the DMP. The lowest dry matter accumulation was noticed under normal spacing of 30 x 30 cm. This was attributed to the high LAI registered under early sowing which might have helped the plants in harvesting higher amount of solar energy and accumulating in the tissues. The increase in the dry matter production was 18 per cent under closer spacing of 15 x 10 cm over normal spacing at 80 DAS. This was due to the increased number of plants per unit area (66 m^{-2}) and higher LAI as reported by Imayavaramban *et al*. (2002).

Early sowing at 26th February recorded higher number of primary branches and secondary branches per plant at harvest stage. The mean number of primary and secondary branches $plant^{-1}$ significantly decreased by even one week delay in the date of sowing. Wider spacing of 45 x 15 cm recorded significantly higher values of primary (157 %) and secondary (148%) branches at harvest stage over closer spacing (15 x 10 cm). The wider planting geometry of 45 x 15 cm enhanced the primary and secondary branches over remaining geometries owing to better geometric arrangement, resulting in better absorption of moisture and nutrients due to lesser competition for growth factors between plants. Similar findings were also reported by Mujaya and Yerokun (2003).

Significantly higher number of capsules m^{-2} was observed under early sowing than delayed sowing. Among the different spacings, wider spacing of 45 x 15 cm registered higher capsule number m^{-2} 26% over closer spacing of 15 x 10 cm and 2.5 per cent over the next best geometry of 30 x 30 cm.This might be due to relatively lesser inter-plant competition for space, light, nutrient and moisture etc. Further, owing to better geometric arrangement, the above factors would have also helped in enhanced photosynthetic rate which consequently might have manifested higher number of capsules m^{-2}. The results fall in line with the observation of Subrahmaniyan *et al*. (2001)

Number of seeds per capsule

Different times of sowing failed to exert any significant influence on the number of seeds $capsule^{-1}$. Higher number of seeds $capsule^{-1}$ was recorded at wider spacing of 45 x 15 cm with 11 per cent increase over closer spacing (15 x 10 cm). It could be ascribed to over all improvement in plant vigour and production of sufficient photosynthates through increased LAI and higher DMP with better partitioning might have increased the number of seeds $capsule^{-1}$. The test weight of sesame differed significantly due to times of sowing. Early sowing recorded higher test weight (4%) than delayed sowing.

Seed yield and oil content

Early sowing (26th February) recorded higher seed yield than delayed sowing may be attributed for favourable climatic conditions, less pest and disease occurence, harnessing of more solar radiation as evidenced through higher LAI, DMP and higher values for all the yield contributing traits which in turn has increased the seed yield. This result is in line with the findings of Tripathi *et al.* (1998). The optimum plant density (14 plants m^{-2}) under wider spacing of 45 x 15 cm would have efficiently utilized all the resources and resulted in increased yield over other geometries tested. This is in agreement with the earlier finding of Thakur and Borulkar (1980).

Conclusion

Performance of sesame variety (KS 95010) was superior when sown early during the second fortnight of February (*Masipattam*) in the rectangular geometry of 45 x 15 cm and this may be considered as an ideal agronomic practice for improving the sesame productivity under irrigated condition in the *Cauvery* delta zone region of Karaikal.

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