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Yield evaluation of sesame, *Sesamum indicum* L in acidic soils of Tripura

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ABSTRACT

A field study was carried out to evaluate the seed yield potentials of thirteen sesame varieties in the experimental farm of KVK, West Tripura of Tripura state in the Kharif Season of 2014-15. It was aimed at selecting high yielding varieties for cultivation in the district. The varieties under study were Rama, MT-75, RT-346, JLT-408, RT-127, TKG-306, RT-54, Nirmala, JTS-8, AKT-10, PKV-NT-11, GT-10, TKG-55. The experiment was laid out in a randomized complete block design (RCBD) in three replications. Different parameters like days to 50 per cent flowering, number of seeds per capsule, capsule length, capsule width, days to maturity, test weight and yield were taken and analysed. The results indicated significant variation among the varieties in seed yield parameters. Varieties RT-54, Nirmala, JTS- 8, Rama and JLT-408 which showed high seed yield of 968,773, 666, 624 and 616 kg/ha respectively were recommended to farmers in the district.

Keywords: Sesame; varieties; seed yield

INTRODUCTION

Sesame (Pedaliaeace) is one of the most ancient crops grown for its oil-rich seeds. Africa and India have been reported as areas of its origin (Bedigan 2003). It is a crop of the tropical and subtropical areas. Good yield has also been recorded from sesame grown in the temperate climate (Blair 2008). Bulk of sesame in the world is grown in the semi-arid regions with little rainfall which is an indication that sesame is a drought tolerant crop and sometimes susceptible to high moisture. However some varieties obtained from the wet areas have been shown to be susceptible to drought conditions (Langham and Weimers 2002). China is the world's highest producer of sesame followed by India and Myanmar. Sudan, Uganda and Nigeria rank 4th, 5th and 6th in that order. The problem of low seed yield has been attributed to the cultivation of poor yielding dehiscent types, yield loss during threshing, lack of agricultural inputs such as improved varieties, fertilizers, pesticides and other agrochemicals, poor management and lack of appropriate breeding programme in

sesame (Olowe et al 2009, Pham et al 2010). They have also noted that lack of good varieties as a result of insufficient variety information for farmers is one important factor that affects the seed yield of the crop. There is an increasing interest in sesame as a source of good quality vegetable oil containing sesaminol, sesamolinol and tocopherol which are important antioxidants important in the prevention of hypertension and stroke (Noguchi et al 2004). The high demand for sesame has also been attributed to the fact that products from sesame meet the health requirement for food in the developed countries and has become an important part of the diet there (Olowe et al 2009). In Tripura sesame production is concentrated in some of the areas only and the production in the area is too low when compared to other major producers of the country. There is therefore the need to expand the area of production of the crop in Tripura to meet with the rising demand for the seeds. Hence it is necessary to evaluate available varieties on their growth, development and seed yield potentials. The present study was carried out to evaluate different sesame varieties with regard to their yield potentials in the West Tripura district of Tripura.

MATERIAL and METHODS

The study was carried out in the experimental farm of the KVK, West Tripura to evaluate the yield potential of thirteen sesame varieties viz Rama, MT-75, RT-346, JLT-408, RT-127, TKG-306, RT-54, Nirmala, JTS-8, AKT-10, PKV-NT-11, GT-10, TKG-55 in the year 2014-15.

The experiment was laid out in a randomized complete block design (RCBD) in three replications. Each block was divided into thirteen plots and the thirteen sesame varieties were randomly allocated to the plots in each block. Each plot measuring 3 × 3 m was separated from each other by a spacing of 0.5 m. Sowing was done on flats by drilling in shallow grooves. Three weeks after sowing, the plants were thinned down to a spacing of 60 × 30 cm. Weeding was done manually using hoe 3 and 8 weeks after sowing. Observations were taken on parameters like days to 50 per cent flowering, number of capsules per plant, number of seeds per capsule, capsule length, capsule width, days to maturity, test weight and yield. Soil samples were collected at random from the experimental plot at a depth of 0 to 15 cm prior to land preparation. These were bulked together to form a composite sample from which a sub-sample was taken for analysis of physico-chemical properties of the soil. The results of the soil analysis are presented in Table 1.

RESULTS and DISCUSSION

The results presented in Table 2 show the yield performance of 13 sesame varieties in the experiment. The results

Table 1. Physico-chemical properties of experimental soil

Soil property	Value/description
Soil texture	Sandy loam
Soil pH	5.6
Available P by Bray's method (kg/ha)	12.84
Available N (kg/ha)	207.65
Available K (kg/ha)	181.58

indicated significant differences among the varieties for the yield attributes. Attainment of 50 per cent flowering was in the range of 36 to 46 days after planting. RT-54 reached 50 per cent flowering earliest among the varieties while MT-75, RT-346, PKV-NT-11, GT-10 and TKG-55 were the latest. Majority of the varieties attained 50 per cent flowering in 35-45 days. There was however no significant differences among the varieties which were almost similar (75-80 days) in number of days to maturity. RT-54, Nirmala and JTS-8 took the maximum number of days to mature (85-90 days). Variety RT-54 produced the highest number of capsules/plant and number of seeds/capsule while MT-75 recorded the least values in these two attributes. The varieties differed significantly from one another in these attributes and the values ranged from 35 to 95 and 14 to 40 for number of capsules/plant and number of seeds/capsules respectively. JLT-408 resulted in longest capsule length while RT-54 recorded the highest capsule width among the varieties. On the other hand MT-75 lead to lowest capsule length and capsule width. Capsule length ranged from 2.22 to 2.81cm while capsule width ranged from 5.65 to 6.83 cm. There was little variation in 1000-seed weight among the accessions. It ranged between 4.43 and 4.49 g. Variety RT-54 yielded highest 1000-seed weight while MT-75, RT-346 and RT-127 had the least values. Seed yield/hectare was in the range of 160 to 968 kg. Variety RT-54 recorded the highest values in the two yield attributes while MT-75 had the least values among all the varieties. The range for attainment of 50 per cent flowering in this study which was in 37 to 47 days, falls within the range as reported by Parameshwarappa et al (2009). There were however minimal differences in capsule length and width among the varieties. The range in capsule length was similar to what was reported by Parameshwarappa et al (2009). It was also observed that days to 50 per cent flowering had a negative relationship with seed yield indicating that increase in number of days to flowering causes decrease in seed yield. Varieties that showed delay in attaining 50 per cent flowering need not be selected for high seed yield. On the contrary days to maturity and seed yield had a positive linear relationship.

Table 2. Mean performance in yield attributes of thirteen sesame varieties

Variety	Days to 50% flowering	Days to maturity	# capsules /plant	# seeds /capsule	Capsule length (cm)	Capsule width (cm)	1000-seed weight (g)	Seed yield /ha (kg)
Rama	38	80-85	53	28	2.57	5.86	4.48	624
MT-75	46	70-75	35	14	2.22	5.65	4.43	160
RT-346	44	75-80	76	31	2.53	6.66	4.44	333
JLT-408	37	75-80	69	26	2.81	6.20	4.47	616
RT-127	42	75-80	69	33	2.70	6.28	4.44	333
TKG-306	42	75-80	62	33	2.60	6.34	4.45	578
RT-54	36	85-90	95	40	2.42	6.83	4.49	968
Nirmala	39	85-90	75	38	2.38	5.84	4.44	773
JTS-8	40	85-90	80	35	2.41	6.01	4.46	666
AKT-10	42	75-80	60	26	2.49	6.15	4.47	477
PKV-NT-11	44	75-80	58	29	2.55	6.57	4.44	245
GT-10	44	75-80	67	38	2.61	6.79	4.48	349
TKG-55	44	75-80	59	33	2.39	6.35	4.45	488

Parameshwarappa et al (2009) also identified a similar phenomenon in sesame. These proved indices for selecting for high seed yield in sesame.

CONCLUSION

The study showed that there was significant variability among the varieties in the yield parameters measured. It also revealed that some of the varieties performed well in terms of seed yield which is comparable to what is obtainable in other sesame producing areas of the country. Varieties RT-54, Nirmala, JTS-8, JLT-408 and Rama which showed good performance in seed yield can therefore be recommended for cultivation in West Tripura district of Tripura.

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