

Performance of Different Varieties of Rapeseed-Mustard (*Brassica* spp.) in Agro-Climatic Condition of Tripura

Anandika Kar¹, Triparna Das Choudhuri² and Utpal Giri^{3*}

Introduction

Rapeseed-Mustard (*Brassica* spp.) group of crops are among the oldest cultivated plants in human civilization. It is third important oilseed crop in the world after Soybean and Oil Palm. India is one of the biggest producers of these crops in the world. India and China together accounted for 42% of total production. Rapeseed-Mustard crop is occupying the second position in production in Indian economy next to Groundnut. About 90% of the total edible oil production in the country comes from this two oilseed crops. The development of rapeseed and mustard in India represents around 18% of the all out oilseed production of the country. Sarson and toria (lahi) are generally termed as rapeseed whereas rai or raya or laha is termed as mustard. Mustard is popular in dishes for its pungency. Pungency in mustard is due to isothiocyanate, enzyme hydrolysis product of glucosinolates. Oil percentage of Rapeseed-Mustard is 33-39%. The seed and oil of rapeseed and mustard are used as a condiment in the preparation of pickles and for flavouring curries and vegetables. The oil cake is used as a cattle feed and manure. Green stems and leaves are a good source of green

fodder for cattle. The leaves of young plants are used as green vegetables as they supply enough sulphur and minerals in the diet. Among the *rabi* oilseeds, rapeseed and mustard can play an important role in the north eastern hill region to boost oilseed production. Among the *rabi* oilseeds, rapeseed and mustard can play an important role in the north eastern hill region to boost oilseed production.

In NEH region, rapeseed - mustard is cultivated in an area of 0.46 lakh ha and the average yield is 888 kg/ha, which is much lower compared to the national average (941 kg ha⁻¹). The recorded production of rapeseed and mustard during the FY 2023-24 is 132.59 LMT (Department of Agriculture and Farmer's Welfare). This is mainly due to some (Package of Practices) PoP like non timely sowing of crops, broadcasting, non timely weeding, non-availability of suitable variety, improper application of recommended dose of fertilizers, cultivation of crops on residual soil moisture, less importance to the crop as compare to vegetable, post-harvest processing unit etc. Its water requirement is very much less as compare to vegetables. It is mostly cultivated in dry farming areas of India. But

^{1&2}College of Agriculture Tripura, Lembucherra, West Tripura (799210), India ; ³College of Agriculture Tripura, Lembucherra, West Tripura (799210), India; *Corresponding author's email: utpalgiricat2014@gmail.com

the climate of Tripura is very much suitable for cultivation of this crop. It is worthy to mention that 90% of the total oil requirement in Tripura is met through imported oil from outside the state. In Tripura, production of oilseeds, particularly mustard, has increased too, but at a much slower pace. Like other states, in Tripura also, Mustard is being cultivated in Rabi season under rice fallow to utilize the residual moisture & residual nutrients. The productivity of Mustard-Rapeseed in Tripura is comparatively lower (840 kg ha^{-1}) than the national average (1161 kg ha^{-1}). The problem of low productivity of mustard under Tripura condition may be attributed to cultivation of low yielding varieties, late sowing, line sowing, thinning, cultivation in residual soil moisture, non- application of fertilizer and timely weeding etc. The suitable variety of rapeseed-mustard is one of the important factor for increasing the productivity of the crop. The productivity of Rapeseed and Mustard can be obtained upto 900-1000 kg/ha by adapting the above-mentioned technology.

Therefore, our objective of this current study was to assess the yield performance of different varieties of rapeseed and mustard in agro-climatic condition of Tripura.

MATERIALS AND METHODS

An experiment was conducted at the upland areas of the experimental farm of College of Agriculture, Tripura, Lembucherra, Tripura (W) during the 2022-23. The 12 varieties of Rapeseed-Mustard were tested in RBD (Randomized Block Design) and replicated thrice to study the effect of different varieties of Rapeseed-

Mustard under agro-climatic condition of Tripura. The 12 varieties/treatment taken were Anushka, Binoy, Sanchita, Sarma, Sita, Pusa Mustard 25, Pusa Mustard 26, Pusa Mustard 27, Pusa Mustard 28, Pusa Mustard 30, Pusa Mustard 31 and Pusa Vijay.

Plant samples were collected at an interval of 30 days after sowing from three randomly selected locations in each. Three plant samples were uprooted randomly from each plot under different treatments to determine the growth attributes like plant height, root length and number of branches per plant as well as the yield attributes such as number of siliqua per plant, number of grains per siliqua and test weight along with the seed yield of each variety. For interpreting the effect of different treatments under different cases, for comparison of F values and at 5% level of Significance, Fisher and Yates Table were followed.

RESULTS AND DISCUSSION

Growth attributes

Plant height increased with the progress of age. The highest plant height (90.80 cm) was observed in Pusa Mustard-27 variety at 90 DAS (Days after sowing) followed by Sanchita variety (89.83 cm). In similar way, root length also increases with the progress of time. The highest root length was recorded by Sarma variety (9.53 cm), followed by Sanchita variety (8.40 cm). In case of total number of branches at the time of harvesting, recorded highest by Sita variety followed by Sanchita and Pusa Mustard 26 variety. Similar findings were recorded by Hedayetulla, Md. *et. al.* (2016).

Table : Effect of varieties of Rapeseed-Mustard to growth attributes

Treatment	Plant Height	Root Length	No. of Branches Plant⁻¹
Anushka	82.87	6.57	6.33
Binoy	85.30	7.30	5.33
Sanchita	89.83	8.40	7.67
Sarma	86.90	9.53	7.00
Sita	82.70	7.57	8.00
Pusa Mustard 25	81.58	7.00	7.00
Pusa Mustard 26	79.58	7.57	7.67
Pusa Mustard 27	90.80	6.43	7.00
Pusa Mustard 28	84.25	6.33	6.00
Pusa Mustard 30	74.14	7.30	6.00
Pusa Mustard 31	79.12	6.60	6.33
Pusa Vijay	79.68	6.60	6.67
SEm(+)	2.65	0.69	0.54
CD at 5%	7.64	1.99	1.56

Yield attributes

All the varieties get matured in almost 81-109 days. In comparison to other varieties, the highest number of siliqua per plant was recorded by Binoy variety (81.00) followed by Pusa Mustard 30 variety (80.00) whereas the lowest number of siliqua per plant was recorded by Sarma variety (63.7). In similar way, the highest number of grains per siliqua is observed in Pusa Mustard 26 followed by Sanchita,

Anushka and Pusa Vijay varieties. The maximum test weight was observed in Pusa Mustard 26 variety followed by Sanchita variety. In case of seed yield, Pusa Mustard 26 variety recorded the highest seed yield (1160.0 kg ha⁻¹) followed by Anushka variety (951.0 kg ha⁻¹) and the lowest seed yield was recorded by Pusa Mustard 28 and Sarma variety. Similar findings were recorded by Hedayetulla, Md. *et al* (2016).

Table : Effect of varieties of Rapeseed-Mustard to yield attributes and yield

Treatment	No. of Siliqua plant⁻¹	No. of Grains siliqua⁻¹	Test Weight (g)	Seed Yield (kg ha⁻¹)
Anushka	77.30	7.00	7.00	951.00
Binoy	81.00	6.67	6.70	725.00
Sanchita	78.70	7.00	7.10	695.00
Sarma	63.70	6.67	6.70	450.00
Sita	72.00	7.00	7.00	500.00
Pusa Mustard 25	59.70	6.00	6.00	457.00
Pusa Mustard 26	73.67	8.67	8.02	1160.00
Pusa Mustard 27	66.67	6.67	6.67	600.00
Pusa Mustard 28	77.00	6.00	6.03	450.00
Pusa Mustard 30	80.00	6.00	6.00	724.00
Pusa Mustard 31	72.65	6.00	6.00	465.00
Pusa Vijay	72.00	7.00	7.00	790.00
SEm(+)	6.78	28.61	0.60	6.50
CD at 5%	19.57	82.64	1.77	19.06

The result revealed that among the three short duration varieties (less than 90 days), 'Anushka' performed better. But irrespective of duration of the varieties and lines, 'Pusa Mustard 26' variety recorded significantly higher growth attributes, yield attributes and yields as compared to the other varieties. For a final conclusion further research should be done, but according to the findings it can be concluded as of now that this variety may contribute significantly

towards sustainable agriculture in Tripura upland condition.

Conclusion

Our present study revealed that among the 12 varieties tested, Pusa Mustard 26 performed well in agro climatic conditions of Tripura based on growth and yield attributes recorded. For a final conclusion further research should be done, but according to the findings it can be concluded as of now that this variety may

contribute significantly towards sustainable agriculture in Tripura upland condition.

Reference

Hedayetullah, M., Giri, U., Saha, D., Saha, A., & Sen, D. 2016. Varietal Performance of Transplanted Rapeseed

and Mustard in Hilly Tract of Tripura. *International Journal of Agriculture and Crop Sciences* **1**(1):40-43.

Gomez, K.A. and Gomez, A.A. 1984. (in) Statistical Procedures for Agricultural Research. John Willey and Sons, Inc., New York, pp.180.