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Yield assessment of Indian mustard variety NRCHB-101 with toria varieties TS 36 and TS 38 in Dibrugarh district of Assam

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Abstract
The trail was carried out through on- farm testing in two selected villages of Dibrugarh district by Krishi Vigyan Kendra, Dibrugarh, Assam during rabi season of 2019-20 with an objective to evaluate the performance of one new mustard variety NRCHB- 101 with the recommended two toria varieties TS 36 and TS 38. Results revealed that the mustard variety NRCHB-101 performed better than the toria varieties TS 36 and TS 38 in respect of growth and yield attributing characters, yields and economic point of view. Considering this results, along with toria varieties TS 36 and TS 38, the mustard variety NRCHB-101 may be cultivated in Assam.

Keywords: Mustard variety, toria varieties, on-farm, growth, yields, economics

Introduction
Rapeseed-mustard is the third most important edible oilseed crops of the world after soybean and Oilpalm. India also rapeseed and mustard is important source of edible oil after groundnut (Pandey *et al.*, 1999) [5]. Rapeseed (toria) is the principal oilseed crop grown during rabi season in Assam, occupying an area of 2.79 lakh hectare with a total production of 1.70 lakh tones (Anonymous, 2015) [1]. It is well known that rapeseed and mustard have different duration, oil yield and oil content. In Assam, most of the farmers prefer rapeseed (toria) because of its duration and low input requirement. On the other hand mustard crop takes longer duration and requires higher fertilizer dose and irrigation facility which may not be possible for all farmers because most of the farmers are marginal and small farmers. Hence, the present study was undertaken to compare the yield performance of recommended varieties of toria with the newly introduced variety of mustard during rabi season on farmers field in Dibrugarh district of Assam.

Materials and Methods
On farm trials were conducted under *rainfed* condition at seven farmers fields during rabi season of 2019-20 in two villages viz. Panimirigaon and Jajhimukh under Dibrugarh district of Assam. Medium land situations were selected in all the farmers' fields and soil samples of the fields were analysed before conducting the trials. The range of analysed soil samples had pH 5.21-6.11, organic carbon 0.53-0.69 per cent, available N 253.7-537.9 kg/ha, available P_2O_5 50.2-52.6 kg/ha and available K_2O 137.8-230.6 kg/ha. The treatments consisted of two varieties of toria viz. TS 36 (check) and TS 38 and mustard variety NRCHB-101 were tested in randomized block design considering each farmer's field as the replication. The toria varieties TS 36 and TS 38 were developed and recommended by Assam Agricultural University, Jorhat, Assam and mustard variety NRCHB-101 was developed by ICAR-DRMR (Directorate of Rapeseed-Mustard Research) and notified in the year 2009. The average grain yield of rapeseed and mustard varieties are 10.75-13.5 q/ha. The plot size of each of the variety was 1300 m^2 with a total area of 3900 m^2 in each farmer. The time of sowing of all the three varieties ranges from November 7 to November 15, 2019, maintaining a spacing of 30cm x 5-7 cm. The recommended dose of fertilizer @60-30-30 kg N, P_2O_5, K_2O/ha was applied as half of N and whole of P_2O_5 and K_2O at the time of sowing. The remaining half dose of N was applied after 30 days of sowing. The rapeseed crop was ready for harvest within 92 days and mustard crop within 115 days. The average rainfall received during the crop growing period ranges from 47.5 to 60.2 mm.

Results and Discussion

The study revealed that toria varieties TS 36 and TS 38 attained almost similar plant height with maturity duration of 90-92 days. The mustard variety NRCHB-101 produced the tallest plants (154.6 cm) and matured 23-25 days later than the two rapeseed varieties. The yield attributing characters viz. number of siliquae/plant and number of seeds/siliqua were recorded significantly higher with the mustard variety, NRCHB-101 than that of toria varieties, TS 38 and TS 36. Similarly the highest seed yield (13.50 q/ha) was recorded with the mustard variety over the two rapeseed varieties maintaining non-significant difference between them. The increase in yield of mustard variety NRCHB-101 over the toria varieties, TS 38 and TS 36 (check) was 20.37 and 22.22 per cent, respectively. These findings are in consistency to those obtained by Yambem *et al.* (2020) [6] and Borah D (2022) [3]. The oil contents of all the three varieties were statistically at per among themselves; however the oil yield was significantly higher with NRCHB-101 over the two toria varieties. The check variety TS 36 without differing with TS 38 recorded the lowest oil yield. An analysis on economics revealed that the mustard variety, NRCHB-101, recorded the highest net return (Rs. 44,800/ha) and monetary productivity (Rs. 389.56/ha/day) with a benefit cost ratio of 2.97 followed by TS 38 and TS 36. This was in conformity with the study conducted by Aheibam *et al*. (2014) [2], Yambem *et al.* (2020) [6] and Chakraborti *et al.* (2022) [4].

Table 1: Growth, yield attributes, oil content, seed and oil yield and economics of toria and mustard varieties at farmers' field.

Variety	Plant height (cm)	No. of siliquae/ plant	No. of seeds/ siliqua	Seed yield (q/ha)	Days to maturity	Oil content (%)	Oil yield (kg/ha)	Net return (Rs./ha)	Benefit- Cost ratio	Monetary productivity (Rs./ha/day)
TS 36 (Check)	99.5	155.5	13.5	10.50	90	35.6	373.8	19,300.00	1.85	214.44
TS38	101.6	157.8	15.5	10.75	92	36.2	389.1	20,300.00	1.89	220.65
NRCHB101	154.6	199.0	18.0	13.50	115	34.5	465.7	44,800.00	2.97	389.56
S.Em±	14.83	11.92	0.87	0.76	-	0.47	30.85	-	-	-
CD (P=0.05)	43.2	35.5	2.6	2.2	-	NS	92.4	-	-	-

NS-Non significant

Conclusion

Based on the study, it can be concluded that along with rapeseed variety TS 36 and TS 38 the mustard variety NRCHB-101 may be cultivated in Assam considering the yield and economic benefits.

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