

**EVALUATION OF CANOLA GRADE, YIELD POTENTIAL AND SHORT
DURATION LINES OF BC₁F₁ AND F₂ POPULATIONS
OF *Brassica rapa***

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Executive Summary

The project was under taken to characterized the 24 F₂ and 24 BC₁F₁ breeding populations for twelve yield, and yield contributing traits at Sher-e-Bangla Agricultural University, Dhaka during rabi season 2022-2023 in a randomized complete block design (RCBD) with three replications. Analysis of variance revealed that significant variation was existed among the F₂ and BC₁F₁ populations. Except days to siliquae maturity, high heritability coupled with high genetic advance were found in all the traits suggested that selection could be rewarded for improvement for these traits. The trait association analysis showed that yield per plant was positively associated with siliquae length, seeds per siliquae, 1000 seed weight, and harvest index at both genotypic and phenotypic levels. The mean performance analysis showed that days to siliquae maturity was lowest in the F₂ population, G24 (84.00 DAS), while the shortest plant height was observed in G6 (83.11 cm), and G1 (88.08 cm). Both the 1000-seed weight, and yield per plant were highest in G23 (3.73g and 10.33), G16 (3.71 g and 9.79 g), and G14 (3.78 and 8.14 g) among the F₂ populations. In days to siliquae maturity, total 20 F₂ populations showed the expected negative heterosis over check variety 1 (cv. Maghi), while for plant height a total of 11 populations manifested the highest negative heterosis over check variety 2 (cv. BARI Sharisha 14). Regarding yield contributing traits, total 15 F₂ populations manifested the positive heterotic effects over check variety 1. Again, a total of 8 F₂ populations over check variety 1, and 14 populations over check variety 2 manifested the expected positive heterotic for yield per plant. Furthermore, among the backcross (BC₁F₁) populations, the lowest days to siliquae maturity was recorded in G23 (83.00 DAS), while the lowest plant height was observed in G8 (80.78 cm). The highest 1000-seed weight was recorded in the BC₁F₁ population, G17 (4.51 g), and the highest seed yield found in G17 (12.33 g) BC₁F₁ population. Over all, the F₂ populations viz., G2, G5, G6, G9, G10, G14, and G24 have been selected for developing early, and short stature lines, while G2, G9, G14, G16, G22, G23 and G24 populations have been selected to develop high yielding lines. Again, the backcross the BC₁F₁ populations viz., G1, G6, G8, G12, G14 G16, G17, G19, G20, G21, G23, and G24 populations have been selected for developing early maturing and yield potential breeding lines of *B. rapa*.

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