Authors:	., Priyamedha (/browse?type=author&value=.%2C+Priyamedha)
Advisor:	Haider, Z. A. (/browse?type=author&value=Haider%2C+Z.+A.)
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Abstract:	The present investigation involves eight lines and five testers to develop forty crosses in a line x tester design. All the thirteen parents and forty crosses were evaluated in randomized block design with three replications in three dates of sowing, representing environments, at Crop Research Centre of Birsa Agricultural University, Ranchi. The experiment was undertaken with a view to determine the per se performance of parental lines, magnitude of heterosis, heterobeltiosis and standard heterosis, to assess the combining ability of parents and crosses, to assess the genotype x environmental interaction and stability parameters of various genotypes for seed yield, yield attributing traits and quality traits. The pooled analysis of variance for sixteen morphological traits indicated significant difference among the environments for all the characters except for siliqua length. The environment wise analysis of variance showed significant differences among the parents and crosses for all the traits studied in all the three environments. On the basis of per se performance, the highest mean seed yield per plant was recorded by the parents Pusa Bold (6.93 g) followed by Pusa Mustard-21 (5.95 g) and NRCHB-101; BPR 543-2 (5.93), while, among crosses, highest was recorded in NRCHB-101 x BPR 543-2 (7.64 g) followed by NRCHB-101 x JN 032 (7.63) and Pusa Bold x Pusa Mustard-21 (7.26). Highest oil content was recorded in JN 032 (42.39 %) followed by NRCDR-02 (42.26 %) and Shivani (41.97 %), while, among crosses, highest was recorded in Shivani x RGN-73 (42.50 %) followed by Pusa Bold x BPR 543-2 (42.38 %) and

Shivani x BPR 543-2 (42.38 %). Lowest erucic acid was recorded in Heera (1.77%) followed by Pusa Mustard-21(2.12 %) and JN 032 (3.71 %), while, among crosses, lowest was recorded in BAUSM-92-1-1 x Pusa Mustard-21 (9.65 %) followed by BAUSM-92-1-1 x Heera (14.05 %) Lowest glucosinolate content was recorded in Heera (26.38 µM/g of oil-free seed meal) followed by JN 032 (38.61) and Kranti (64.17), while, among crosses, lowest was recorded in NRCDR-02 x Heera (33.56 µM/g) followed by NRCHB-101 x Heera (35.49) and Shivani x Heera (37.52 µM/g). Out of 40 crosses, BAUM-2007 x Heera, BAUM-2007 x JN 032, BAUM-2007 x RGN-73, Pusa Mustard-25 x RGN-73 and Kranti x Heera came out to be the promising because of having high heterotic effect for seed yield and yield attributing traits. In the case of standard heterosis, crosses BAUM-2007 x JN 032, Pusa Mustard-25 x Heera, Pusa Bold x Heera, BAUM-2007 x Heera and Pusa Bold x Pusa Mustard-21 came out to be the promising crosses for some important yield component characters in most of environments. The cross Pusa Bold x BPR 543-2 was found promising for oil content. The environment wise combining ability analysis revealed significant GCA and SCA variances for almost all the characters studied indicated that all these traits were controlled by both additive and non-additive gene effects. The parents, Pusa Bold, NRCHB 101 and RGN-73 were emerged as good general combiner with high per se performance for seed yield/plant and most of contributing characters. However, the parents, Shivani, Pusa Mustard-25, BAUM-2007, Heera and BPR 543-2 were good general combiners for specific yield component characters. The parents, Shivani, BPR 543-2 and Heera were good general combiners for oil content and other quality traits. Some promising crosses having high SCA effects in desired direction for seed yield/plant and related traits were BAUM-2007 x Heera, Pusa Mustard-25 x JN 032, NRCHB-101 x BPR 543-2, NRCHB-101 x JN 032, BAUSM-92-1-1 x RGN-73 and Kranti x Heera. Some of the crosses having high SCA effects in desired direction were NRCDR-02 x BPR 543-2, NRCHB-101 x Pusa Mustard-21, NRCHB-101 x Heera, NRCDR-02 x Heera, NRCHB-101 x JN 032, Pusa Bold x Pusa Mustard-21, Shivani x Heera, BAUM-2007 x Heera and BAUSM-92-1-1 x Heera for yield related traits. Stability revealed that genotypes as well as environment were highly significant for all the eight morphological characters under study. This revealed significant variation among genotypes and among environments. Sufficient G X E interaction was exhibited by the genotypes for all the characters. The environment (linear) was highly significant for all the characters, while the linear component of G X E interaction was highly significant for days to maturity only. Pooled deviation differed significantly for all the characters, suggesting the genotypes had varying level of stability over the sowing times for these characters. The parents viz. NRCDR-02, Pusa Bold and BPR 543-2 as well as the crosses viz. Pusa Bold x Pusa Mustard-21, Pusa Bold x RGN-73, Pusa Bold x JN- 032, Shivani x Heera, Shivani x BPR 543-2, Kranti x BPR 543-2 and BAUM-2007 x JN- 032 exhibited high mean and showed stable performance for seed yield/plant. Stability parameters indicated that BAUSM-92-1-1 (plant height and number of seeds/siliqua) and BAUM-2007 x JN-032 (total number of siliqua/plant, number of seeds/siliqua and seed yield/plant) were fairly stable across the environments. BAUM-2007 and Pusa Mustard- 21 showed relatively stable performance for number of siliquae on main shoot and1000 - seed weight over environments. Thus, these genotypes can be utilized to develop stable strains having wider adaptability for different sowing times. Overall crosses based on high per se performance, high SCA effects, high heterobeltiosis and high standard heterosis were BAUM-2007 x JN 032 and NRCHB- 101 x BPR 543-2 in E3 for point to first branch; BAUM-2007 x JN 032 in E3 for point to first siliqua; BAUM-2007 x RGN-73 in E2 for number of secondary branches; Kranti x BPR 543-2 in E2 for number of siliquae on main shoot; Kranti x Heera in E3 for total number of siliqua/plant; Kranti x Heera in E3 for number of seeds/siliqua. As the environmental effect on the expression of the character was very high, different crosses emerged in different environments for different yield attributing traits. Thus, these crosses can be included in the breeding programme for improvement in yield in specific environment.

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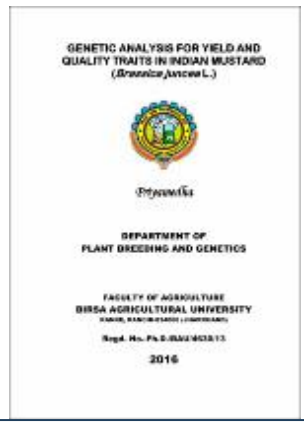
1583 Dr. Priyamedha, Final Thesis.pdf		9.92 MB	Adobe PDF	

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