ABSTRACT

The demand of rice is expected to exceed production in developing countries after a few years. In Assam, the population growth in percentage for the last two decades is more (2.1%) than the percentage growth in rice production and productivity (1.86% and 0.92%). Therefore, breeding rice for higher yield potential is very important. Among the various genetic options available for enhancing productivity levels, hybrid rice technology appears to be one of the most feasible and readily adoptable.

The present investigation was therefore conducted at RARS, Titabar under four environments (2 fertility status x 2 seasons) with four major objectives viz. to study the combining ability of restorer lines and their crosses with the CMS lines, to study the extent of heterosis, to study the GE interaction and phenotypic stability of the restorer lines and resultant hybrids and to study the inheritance study of fertility restoration. The test material consisted of 50 F₁ crosses generated by crossing 5 CMS lines with 10 restorers in a line x tester fashion and their parents. Altogether, 10 characters were recorded.

High variances were observed for all characters and under all environments. The genotypes expressed inconsistently for different characters over environments. Preponderance of non-additive gene actions was observed for all characters except panicle exsertion.

The best combiners among lines for grain yield per plant were Pant 2B and IR 69616B and among the testers were Luit, Govind, IR 36, IR 50 and IR 64. A good number of cross combinations had significant sca effects in the desirable direction for different characters. Significant sca effects were found to be produced by all kinds of combinations viz. high x high, high x low and low x low general combinations.

Significant heterosis in the desired direction were observed for all characters. However, only two hybrids viz., IR 62829A x Lachit and PMS 2A x Luit exhibited over 20% standard heterosis for yield over the check Satyaranjan.

The hybrids were found to be more responsive but less stable and less predictable than the parents over environments. A number of hybrids with high yield performance and average or below average stability for grain yield per plant were identified viz., IR 69616A x Lachit, IR 62829A x IR 64, Pant 2A x Jaya, IR 69616A x Jaya and PMS 2A x Luit.

Analysis to study the nature of inheritance of fertility restoration revealed it to be governed by two genes (9:3:4, 9:6:1 and 12:3:1).