

ANALYSIS OF A CYTOPLASMIC MALE STERILE (CMS) HYBRID RICE PROGRAM WITH MOLECULAR MARKERS. Beló A¹⁻², Cavalheiro ST¹, Amaral ZP¹, Guimarães EP³, Rangel PHN³ and Ferreira ME²⁻⁴. ¹Laboratório de Genética, EMBRAPA – Recursos Genéticos e Biotecnologia. ²Pós-graduação em Recursos Genéticos Vegetais – UFSC. ³EMBRAPA – Arroz e Feijão. ⁴Universidade Católica de Brasília. andbelo@hotmail.com

The use of hybrid technology in rice (*Oryza sativa* L.) allowed a significant increment of grain production in several countries. Hybrid rice programs are usually based on the cytoplasmic male sterility (CMS) system, defined by the use of male sterile (A), maintainer (B) and restorer (R) lines. The main limitations of these programs are the difficulty to test all possible crosses to identify a superior combination, and the actual development of lines to use in the crosses. The objective of this work was to evaluate the genetic diversity of lines used in the Embrapa's Hybrid Rice Program and to investigate the yield potential of hybrids formed by crosses based on genetic distance. Two hundred and sixty-seven rice lines, including four male-sterile lines, were evaluated for genetic diversity with RAPD markers. The genetic diversity among them was estimated by genetic similarity (DICE coef.) followed by UPGMA cluster analysis. Some restorer lines were select based on the genetic similarity data and crossed with the four male-sterile lines. A total of 70 F1 hybrids, their parental lines and four control varieties widely cultivated in Central Brazil were evaluated for grain yield, yield components and several agronomic traits in a randomized complete blocks design. Analysis of variance was performed using different models to explain the hybrid potential and the F-test significance analyzed to determine the characteristic of hybrids. The highest yield, observed in one of the tested hybrids, was 9,806 Kg/ha. Significant differences were detected between most of the tested inbred lines and hybrids using different models ($p < 0,001$). Hybrid yields (indica x indica crosses and indica x japonica crosses) were significantly different from inbred line yields. The percentage of filled grains (PFG) was higher in inbred lines than in the tested hybrids, indicating an increase of sterility when crosses are performed. The hybrid sterility of indica x japonica crosses was greater than indica x indica crosses, indicating that an increase in parental genetic distance is associated with an increase in observed sterility. Hybrids were usually taller than inbred lines, indicating that plant height was associated with hybrid vigor. Hybrids had in general higher yields than inbred lines, what suggests a good potential for the use of hybrid rice technology. Overall, the data suggests the existence of heterotic groups in rice, signaling for the importance of selecting specific parental lines combinations in order to maximize hybrid vigor. Órgão Financiador : PADCT/CNPq and FAP-DF