

Jantra Suanjan 2015: Improvement of A, B and R Lines for Hybrid Corn Production.

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There are three types of cytoplasmic and genetic male sterility in field corn (*Zea mays* L.) namely T, S and C separated by their restore gene (*Rf*) in nucleus. At the present, C type is popularly used for hybrid seed production. The objectives of this study were to improve the male sterility line (A line) and its maintainer line (B line) by backcross method and to search the complete restorer lines (R line) of obtained male sterility line. Ten counterpart of A-BC₃ lines (A lines and its maintainer B lines) were used as male sterility lines. Increasing the homozygosity in each counterpart line three times of backcross method were applied to obtain A-BC₄, A-BC₅ and A-BC₆. Ten A-lines in each backcross generation were used as female parent. On the other hand three R lines (Ki21, Ki46 and Ki48) were used as male parent. Thirty hybrids in each backcross generation of A line by line x tester were produced for yield trial in 3 seasons. The results showed that only four crosses, Ag4-2^A x Ki21, Ki18-1^A x Ki21, Ki18-3^A x Ki21 and Ki46-2^A x Ki21 had completely male fertile through three growing seasons. The average grain yield of these hybrids ranged from 1,069-1,097 kg/rai and the cross of Ag4-2^A x Ki21 was the highest grain yield about 1,097 kg/rai. While, four crosses, Ag18-1^A x Ki21, Ag40-1^A x Ki21, Ki18-1^A x Ki46 and Ki18-3^A x Ki46 had partial restorer male sterile through three growing seasons. The average grain yield of these hybrids ranged from 1,005-1,139 kg/rai and the cross of Ki18-3^A x Ki46 was the highest grain yield about 1,139 kg/rai. From this study, four BC₆ of A and B counterpart lines (Ag4-2, Ki18-1, Ki18-3 and Ki46-2) were selected giving completely fertile pollen when crossing with Ki21.

Student's signature

Thesis Advisor's signature