

Thanongsinh Vongsipasom 2007: Development of Male Sterile C-cms in Maize by Early Generation Backcrossing. Master of Science (Agriculture), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Wasana Wongyai, D.Agr. 72 pages.

Early generation backcrossing was used to development male sterile C – cms cytoplasm (A – line) in maize. The maintainer line (Ki 28 N, B – line) was crossed to the forty – five restorer lines (R – line). Forty – five F_1 crosses were obtained and were grown in September 2004. The F_2 generation of these crosses were grown in January 2005 at the National Corn and Sorghum Research Center, Pakchong District, NakornRatchasima Province. F_2 plants with desirable traits were selected for improving A and B lines. To transfer cms to F_2 plants, the crosses of the male sterile line (Ki 28 C, A – line) and the selected F_2 were made. F_1 of the crosses of A x F_2 were grown to classified the selected F_2 plants into B or R lines. F_1 plant is male sterile, it means that F_2 plant is B – line. In the case F_1 plant is male fertile, it means that F_2 plant is R – line. F_1 plant being male sterile is the new A – line (A_1). The fourteen F_2 plants (B – line) were selected and then backcross to the isogenic A_1 - line. The BC_1F_1 or A_2 – lines were obtained. Forty – two topcross were made by crossing between A_2 - line and tester, Ki 21 , Kei 0403 and Kei 0504

Forty – two topcross and fourteen B - lines were tested for their yielding ability in randomized complete block design with two replications. Yield of the topten topcross ranged from 820 – 957 kg/rai while it ranged from 173 – 359 kg/rai in the topten B - lines. The topten topcross yield derived from five lines of the topten B – lines. The rank of five B lines was 2 , 5 , 7 , 8 and 10 and yield of topcross rank at 1 and 5 , 3 and 9 , 2 and 7 , 6 and 8 respectively. The first rank of B – line yield gave the rank of topcross yield of the testers , Ki 21 , Kei 0403 and Kei 0504 at 21 , 23 and 40 respectively. The results studied revealed that selection A line based on yield of B - line would not select the A - line with good combining ability. It is concluded that selection A – line with good combining ability by considering topcross yield is better than based on yield of B – line . In addition, the early generation backcrossing method can develop A , B and R – lines at the sametime. This breeding method gave 6 – 8 years less than the traditional method for development A – line. It also reduced the expense for research work. Thus, this method is efficiency and suitable for development hybrid in maize

Student's signature

Thesis Advisor's signature