

Sanon Suksatan 2014: Breeding for Purple Opaque-2 Tein Corn. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Choosak Jompuk, Dr.sc.nat. 68 pages.

To transfer the opaque-2 gene into tein corn, the tryptophan content in its kernel was increased. Moreover, if an anthocyanin was added into the kernel of this corn, it would be more benefit for consumer. So, the objective of this study were to increase the tryptophan content in an endosperm and adding anthocyanin in pericarp of kernel and use phi057 as marker- assisted selection (MAS) for opaque-2 gene in segregating population. Cross was made between tein opaque-2 corn ($o_2o_2Pr_{cc}$) as female parent and waxy purple corn (Fancy Purple 111, $O_2O_2Pr_{C_}$) as male parent. The F_1 hybrid was grown and self-pollinated to obtain S_1 line. In the segregating population of S_1 plant, DNA marker (phi057) was applied as marker-assisted selection (MAS) for the opaque-2 gene or homozygous recessive of opaque-2 (o_2o_2) and purple kernel of selected plant was harvested. Then, selected plants were self-pollinated until S_4 generation. Topcross was made from ten purple opaque-2 tein lines and three white opaque-2 tein lines by using the purple kernel as tester. The results showed that all selected lines (S_4) had high tryptophan content in endosperm (0.58-0.80%). Moreover, an anthocyanin of these purple kernel lines ranged from 75-251 mg/100 of dry weight while an anthocyanin of white kernel lines ranged from 5-9.5 mg/100. On the other hand, tryptophan content and anthocyanin of Purple Fancy 111 (check variety) was about 0.28% and 190 mg/100 of dry weight, respectively. For F_1 hybrid, the result showed that tryptophan content was high as their parents ranging from 0.49-0.77% and anthocyanin ranged from 35.9-216.6 mg/100 depending on the number of purple ear in each cross. The green ear weight of F_1 ranged from 853-1,763 kg per rai and the superior hybrid was the cross of POTH3 x POTH10.

Student's signature

Thesis Advisor's signature