

Sitthinan Jongpho 2012: Development of Composite-sibbed Lines by Alternate S_1 ~ Half-sibbed and S_1 ~ Full-sibbed Selections for Commercial Corn Hybrids. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Professor Krisda Samphantharak, Ph.D. 111 pages.

The elite inbreds and hybrids from Kasetsart University Corn Breeding Program, Agronomy Department, Faculty of Agriculture, Kasetsart University, Bangkok were used to formulate crosses for the composite-sibbed line extraction. Potential of the selection methods inbreeding. Evaluated on the basis of the performance *per se*, and yielding ability of the composite-sibbed lines and their hybrid combinations. The S_1 ~FS and S_1 ~HS selection methods when combined with visual selection in the early generations of selection are very effective methods to generate high yielding and high performance *per se* of the selected composite-sibbed lines. The resulted yielded ranged from 3,670-8,696 kg/ha. Moreover, most of the first seven high yielding composite-sibbed lines show distinctive performances in hybrid combinations especially when crossed to the eight relatively lower yielding lines (HxL). Therefore, the balance actions of additive and non-additive genes are needed for the outstanding hybrid. In fact, heterosis calculated at MP shows level of non-additive effect in the hybrid or genetic diversity of both parents and heterosis calculated at HP shows level of superiority of the hybrid over high parent but they do not imply the true value of the hybrid. Because of having high economic value not high heterosis is necessary for the outstanding hybrid. Generally, both high GCA and high SCA of parents are required for the outstanding hybrid. In this case, yield of the top-4 hybrids ranged from 10,322-11,072 kg/ha as compared with 10,280 kg/ha of the best commercial single cross hybrid. Therefore, composite-sibbed lines do not have high yield but also have a potential to be parents of the outstanding hybrids and could compete with the commercial single cross hybrid in the market.

Student's signature

Thesis Advisor's signature