Amarawan Tippayawat 2008: Potential of Composite Line Methods for the Development of Waxy Corn Hybrid (*Zea mays* L.). Master of Science (Agriculture), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Professor Krisda Samphantharak, Ph.D. 114 pages.

Five lines of BC_1F_1 of each of 3 families of which derived from crossing between shrunken inbreds and a waxy inbred, sh2/sh2//wx///sh2F_1. Afterward, they were selfed up to BC_1S_2. Each of them was subjected to 4 selection methods : e.g. 1) selfed family selection (SFL), 2) mass sibbed family selection (MSL), 3) topcrossed family selection (TCL) and 4) recurrent sibbed selection (RSL). Therefore, 15 lines from each method and total of 60 lines were derived. They were testcrossed to a tester, Agwx 20 in BC_1S_4 generation of SFL and the first sibbing generation of other 3 methods. Two lines from each method, based on their testcross performance were selected in BC_1S_6 generation of SFL, 4th sibbing generation of MSL and TCL and 2 generations each for selfing and sibbing of RSL. The 8 derived lines were diallel crossed to obtain 28 crosses. They were subjected to yield trial along with all inbreds in the 7th generation of selection.

The RSL showed highest yield potential of inbreds followed by MSL, SFL and TCL respectively. However, WSFL 25 and WRSL 22 were distinctively exceptional in hybrid combinations since 8 out of the top – 10 crosses, 4 each were from combinations of each line. The results indicated that yield of inbred does not a good parameter for high combining ability of a line. However, high yield inbred resulted from additive effect of dominance (homozygous dominance) and therefore, it is a good reason to select for high yield inbred in early generations before testing for the best combination in later generation. Morever, quality traits of waxy corn normally controlled by recessive genes as such the advantages of the RSL are distinctively evident, theoretically and empirically.

Amarawan Tippayawat — Student's signature

Thesis Advisor's signature — 27 / 05 / 08