Somwung Anusonpornpurm 2008: Quantitative Triats Loci (QTLs) Mapping for Fiber Content and Agronomic Characters in Sugarcane Using AFLP Marker. Doctor of Philosophy (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Associate Professor Rewat Lersrutaiyotin, D.Agr. 98 pages.

The population of 168 progenies derived from a cross between a sugarcane commercial variety (K 93-207) and a *S. spontaneum* L. clone (MPT 97-1) were evaluated in a three replicated field trial. Stalk diameter and tillering were recorded at harvesting and subsequently, plant material was evaluated for fiber content. Clones were significantly different (P<0.01) for all traits analyzed. A total of 263 AFLP simplex markers from 26 primer combinations were used to analyze the inheritance of quantitative traits loci (QTLs) for stalk diameter, tillering and fiber content. Thirty eight putative QTLs from simplex the markers were identified for stalk diameter, 18 for tillering and another 20 for fiber content. Each QTL had PVE (phenotypic variant explained, R^2) ranged from 3 to 12% for 3 traits. The nineteen of these QTLs were identified for more than one trait. Most fiber content QTLs of *Saccharum spontaneum* L. contributed a positive effect for tillering and a negative effect for stalk diameter. The QTLs of commercial variety contributed negative effect for fiber content, number of stalk and a positive effect for stalk diameter. The 127 and 136 of simplex markers were used to establish female and male linkage maps. Linkage analysis (LOD = 4.0) placed them into 27 and 25 linkage groups for male and female linkage maps respectively. The total 110 simplex markers were unlinked. The 23 simplex QTLs for stalk diameter, 12 for tillering and 9 for fiber content were located into both linkage maps. The possible explanation for the small number of linked marker is that this map was from a cross between commercial and wild relative, with a very complex genetic system.

_____ _____ ___ / ___ / ____

Student's signature Thesis Advisor's signature