

Jumnong Chanthaworn 2011: Effects of Inbreeding on Agronomic Traits of Thai Cassava Cultivars. Master of Science (Agronomy), Major Field: Agronomy, Department of Agronomy. Thesis Advisor: Professor Chareinsak Rojanaridpiched, Ph.D. 123 pages.

The inbreeding effect in Thai cassava cultivars was examined to furthering inbred line development and screening for the recessive traits, especially amylose-free starch (waxy starch). Total 2,412 progeny lines from inbreeding and without inbreeding crosses were obtained from 6 Thai commercial cultivars and 3 elite lines. No waxy starch line was found from 2,412 progenies by potassium iodine (KI) test. It is recommended to increase the number and diversity of parental varieties for further screening. Inbreeding depression (ID) of  $F_1$  progenies was measured as percentage reduction from parental average in agronomic traits such as germination (Ger), plant height (PH), fresh root weight (FRW), stem and leaf weight (StLW), harvest index (HI), root starch content (RSC) and root dry matter content (RDMC). The  $F_1$  progenies having coefficient of inbreeding (F) of 0.50 have greater ID than those having F of 0.25 in all parameters studied. When F was 0.50, the ID was the highest for FRW at 55.7 % followed by StLW, Ger, PH, HI, RSC and RDMC which were 51.1, 26.4, 21.3, 13.5, 12.7 and 7.5 %, respectively. At 0.25 F level, the ID of FRW, StLW, Ger, PH, HI, RSC and RDMC were 37.5, 32.5, 30.7, 14.2, 9.0, 9.3 and 4.5 %, respectively. There were no significant differences between the midparent and population mean of progenies with 0 F level. The progenies from inbreeding of different parents had different ID. Selfing progenies from Kasetart 50 have the lowest ID, while Huay Bong 60 and Huay Bong 80 were the highest. This indicated that selection of parents for inbreeding is necessary. But, inbred line development for hybrid takes a long time. It is recommended that cross between selected  $S_1$  or  $S_2$  lines might have a better chance to get good progenies than normal varietal cross.

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Thesis Advisor's signature