

Bootsarin Tana 2015: Study on Sucrose Accumulation and Invertase Enzyme Activity in Sugarcane. Master of Science (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Ms. Nongluk Teinseree, Ph.D. 79 pages.

Sucrose content and enzyme activities of soluble acid invertase (SAI), neutral invertase (NI) and cell wall invertase (CWI) in cultivated sugarcane (*Saccharum officinarum* L.), line 20-2248 and *S. spontaneum*, line S98-244 at various developmental stages, six to twelve-month after planting (MAP) stems, were monitored and the correlation among them were analysed. In each stem, the three parts of internodes the top, middle and bottom representing relatively immature, maturing and mature internode, respectively were collected for the experiment. The results showed that sugarcane stems of different species revealed different patterns of sucrose accumulation and enzyme activities. In line 20-2248, the sucrose content was increased with increasing of the month after planting (from 6 to 12 MAP) and was highest in the bottom part and decreased in the middle and top part, respectively. The activities of SAI, NI and CWI decreased with increasing of month after planting (from 6 to 12 MAP) and was highest in the top part and decreased in the middle and bottom part, respectively. There were significantly negative correlations between sucrose content and the activities of SAI, NI and CWI. In line S98-244, the sucrose content peaked at 8 MAP and then declined toward the maturity of 12 MAP. The mid-part of stem was marked higher in the concentration of sucrose over the middle and bottom parts. The activities of SAI and CWI increased with increasing of month after planting (from 6 to 12 MAP) except NI, that stable in all stages. The activities of SAI, NI and CWI was highest in the top part and decreased in the middle and bottom parts. Only the SAI activity gave negatively significant correlation for sucrose content while the correlation between NI and CWI activity for sucrose content showed negative correlation but was not significant.

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Thesis Advisor's signature