Three Thai cassava varieties, Huaybong 60 (HB60), Kasetsart 50 (KU50) and Rayong 1 (R1) were used in this study to evaluate the steady-state transcript accumulation of the major starch biosynthetic genes: AGPase B, BE I and GBSS I in outdoor pot experiment, with this observation the agronomic characterization and starch analyses were also studied. Total dry weight (TDW) of storage roots, it was found to be the highest at 9 months after planting (MAP) in all three varieties. HB60 showed higher TDW than those of KU50 and R1 at 13% and 30%, respectively. Maximum total leaf area was reached from 3 to 5 MAP then started to decline. The storage roots to leaf area ratio increased from 3 MAP until 11 MAP, and HB60 showed the highest ratio. The nutrient analysis showed that nitrogen content highest accumulated in leaves and R1 demonstrated highest level of nitrogen. Available phosphorus is accumulated mainly in petioles, stems but lower in storage roots. Potassium contents of storage roots (root pulp & root peel) increased at the different date of development, while they decreased in stem and petioles 3 to 11 MAP.

The level of AGPase B expression was increased over time along the storage roots development and yielded the highest expression at 11 MAP, reflecting the highest cassava starch contents (percent on dry weight basis) at the same period. The cassava starch contents were found to be the highest at 86.22% in HB60. The Amylose percentages were not different. It showed approximately 18.7 to 20.6 percent. The expression of GBSS I increased along the ages of the plants, while expression of BE I during storage roots development, showed the highest expression at 7 MAP. The differential expression of AGPase B gene by incubated with 5% sucrose was also evaluated in both leaves and root tissues. The result showed increasing trend of AGPase B gene expression when compared with control. The high level of expression of this gene in cassava leaf and root tissues was most pronounced at 3 day after incubation in 5% sucrose. In addition, the expression of BE I showed similar trend when compared with AGPase B expression. In contrast, GBSS I could not be detected, although when induced with sucrose.