



➔ 3.2.1 Chitundu Davies C. (2000). Heritability estimates of selected root parameters of sweet potato (*Ipomoea batatas* (L.) Lam.) (Supervisors: Dr. M. S. Mwala and Dr. R. Soernarjo).

Sweet potato is an important source of carbohydrates among small-scale farmers in Zambia and ranks second only to cassava. Though increase in fresh root yield of sweet potato has been achieved, newly released varieties have very low acceptance by farmers. To provide information for the improvement of sweet potato acceptance, a study was carried out to estimate heritability (h^2) of root weight per plant, number of roots per plant, root size and root dry matter content in Mansa, Zambia at two sites during the 1996/97 season. The experiments were laid in a Randomized Complete Block Design with three replications at each site. A total of 44 treatments, comprising 11 parents and their 33 progenies, were used. Heritability (h^2) was estimated by simple linear regression of the response of half siblings against the mean of their maternal parents. Though variations among treatments were detected, most of them were due to non-genetic effects. Non significant heritability values were obtained for root weight per plant (-0.54), root size (-0.78) and root dry matter content (-0.09). On the other hand, heritability for the number of roots per plant was significantly high (0.82*). Weight per plant and root size were significantly correlated ($r=0.65^*$). Varieties with high root dry matter content were relatively more acceptable ($r=0.31$). Root size was found to be the most important contributor to final root yield (53.10%), followed by the number of roots per plant (22.65%). The present study showed that selection based on parent performance would lead to insignificant improvement with regard to root dry matter content, root weight per plant and root size. The environmental effects were more important in the expression of these traits than the genetic effects. The selection procedures for these important traits have to be indirect and the path coefficient analysis would discern the strategy. The number of roots per plant on the other hand could be improved through phenotypic selection. Root dry matter content can be used as an indicator of acceptability of newly developed varieties.