3.2.3  Serenje Gerald. I. (2010). Variation in micronutrient content of orange-fleshed sweetpotato (Ipomoea batatas (L.) Lam) varieties grown in different environments (Supervisors: Dr M. S. Mwala and Dr M. Chiona)

Sweet potato is one of the most important sources of carbohydrates among small-scale farmers in Zambia and ranking second only to cassava. A study was conducted under field conditions at three locations during the 2008/09 season to determine the variability of micronutrients and to characterise the agronomic parameters of orange-fleshed sweet potato varieties grown under different environments. Fifteen varieties, including 2 local varieties, were evaluated in a RCBD with 3 replications. The results showed that varieties were significantly different ($P \leq 0.05$) for iron. Naspotl and Ukerewe had the highest iron concentration at 11.20 mg/100g and 8.06 mg/100g. There was differential response of the varieties to the locations with regards to iron. Differences were observed among locations, only, for zinc with Kamato recording 44 mg/100g followed by Mansa with 27 mg/100g and lastly 12.8 mg/100g at Mutanda. Locations, varieties and interactions were significantly different ($P \leq 0.05$) for β-carotene and vitamin A concentrations of sweetpotato. The varieties Zambezi, K566632, 199062.1 and Mayai produced high mean concentration of β-carotene at 7.82 mg/I00g, 7.89 mg/100g, 6.18 mg/100g and 6.52 mg/100g, respectively. Aspot I and 199062.1 had the highest total plant weight of 21.88 t/ha and 19.78 t/ha respectively, while Kakamega had the lowest at 7.15 t/ha. The highest mean total plant weight of 16.7 t/ha was at Mutanda, while the lowest was at Mansa at 13.2 t/ha. The variety with the highest marketable yield was Naspotl at 13.74 t/ha with Kakamega having the lowest at 5.23 t/ha. The highest non marketable yield varieties was Kalungwishi at 7.26 t/ha. There was a differential response in non-marketable yield for varieties tested as evidenced by significant interactions. Significant differences were also observed for weevil score, vine weight and harvest index. Carrot.C had the highest weevil score of 2.62 while Naspotl was lowest at 1.31. The varieties with high vine weight were K 118 and Gweri at 4.52 t/ha and 4.29 t/ha, respectively while Ejumula had the lowest vine weight with 1.94 t/ha. Gweri, Kakamega and Pipi had the lowest HI with values of 67%, 68% and 70%, respectively. Sufficient variation exists among the orange fleshed sweetpotato for micronutrients to allow for identification of superior materials for cultivation. Agronomically, the materials tested revealed that varieties with combination of suitable characteristics are identifiable. Naspot I and 199062.1 were identified as the best varieties on the basis of levels of micronutrients and agronomical performance.