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"Post-Harvest physiology of  
sweet potato storage roots related  
to storability."

## RELATING THE POST-HARVEST PHYSIOLOGY OF SWEET POTATO STORAGE ROOTS WITH STORABILITY FOR A RANGE OF EAST AFRICAN VARIETIES

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### INTRODUCTION

Sweet potato (*Ipomoea batatas*) is very important as a staple crop in many developing countries. However, its potential is constrained by the perishability of the storage roots which limits the time that the crop can be kept in the ground after maturity and limits post-harvest shelf-life. Given the genetic diversity of sweet potato germplasm, there is great potential for improving storability of the root through breeding. Root composition and metabolism are key factors affecting rates of physiological deterioration and susceptibility to pests and diseases. The purpose of this study is to identify the key physiological factors associated with perishability, with the objective of determining selection criteria to be used within breeding programmes.

### EXPERIMENTAL

In March 1995 and April 1996 sweet potatoes were grown in Kenya, air-freighted to the UK and maintained under simulated tropical storage conditions (27°C, R.H. >95%). Two varieties studied were perceived by Kenyan farmers and traders as being perishable, and two as having long-shelf life. During storage, measurements were made of respiration, rates of loss of dry and fresh weight, sugar content (hpic), rates of wound healing (staining for lignin) and sprouting.

### RESULTS AND DISCUSSION

Physiological differences related to perishability were observed. Over the course of six weeks of storage, "perishable varieties", Kemb10 and SPK004, had respiration rates up to twice that of the "long-shelf-life" varieties Kemb36 and KSP20. This was reflected in the rate of loss of dry matter. Although more precise information about relative rates of deterioration in-country were lacking, on the basis of this study, KSP20 was identified as the best variety for long-term storage, having a low metabolic rate, high rates of wound healing and low sprouting. SPK004 was identified as the worst storing variety by the same criteria. KSP20 was distinguished from the other varieties by a low dry matter content,

low sucrose levels and high monosaccharide (glucose and fructose) levels. This is contrary to previous observations on North American varieties that indicate that low dry matter is associated with high respiration rates and perishability (Kays 1985). This may be related to the fact that East African varieties tend to have higher dry matter contents than North American varieties. As sugar profile is obviously an indication of metabolic status, the relationship between sugar levels, metabolic rates, sprouting, wound healing etc. requires additional investigation. The possibility of using sugar profiles as a selection criterion for long-storing varieties should be considered, although it will be important to consider acceptability of taste by consumers.

### ACKNOWLEDGMENTS

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### REFERENCES

- Kays, S.J., 1985, The physiology of yield in sweet potato. *in* Sweet Potato Products: A Natural Resource for the Tropics, J.C.Bouwkamp ed. CRC Press, Boca Rouge, Florida USA.