Effect of storage condition and post-harvest handling method on the shelf life of stored S. aethiopicum

Sekulya S1, Namutebi A1, Nandutu A1, Kabod P1, Ssozi J1, Masanza M2, Jagwe J. N1, Kasharu A4, Rees D5, Acham. H1, and Kizito E. B2

1Makerere University, P.O. Box 7062, Kampala, Uganda, 2Uganda Christian University, P.O. Box 4, Mukono, Uganda; 3Farmgain Africa 4Chain Uganda Limited 5Natural Resources Institute, University of Greenwich, Central Avenue, Chatham Maritime, Chatham, Kent ME4 4TB, UK

Background
The leafy type of vegetables, and their high moisture content gives them a short shelf life. On average S. aethiopicum (Shum) has a shelf life of one day, making it unable to keep fresh for a long time. This study was done to determine the effect of post-harvest handling practices and storage technology on the post-harvest quality in S. aethiopicum.

Methodology
The post-harvest handling and storage technologies were tested under two experimental conditions (with [RI] and without roots [RC]) and three different environmental conditions [i] 21.0±1.00 °C, 95.67±3.01% RH; [ii] in ambient storage (AC), 23.8±2.86 °C, 69.38±6.72% RH; and [iii] in cold room (CR), 7.17±1.30 °C, 95.80±3.19% RH. Two kg of harvested RI and RC were kept in a charcoal cooler (CC). Experiment two involved storing 2.0 kg of S. aethiopicum in charcoal cooler with no water treatment (TT) and in ambient storage while immersing in portable water for 2 to 3 seconds during the day (TT1).

Results and Discussion
The most rapid decrease in chlorophyll content was observed in RC-AC as shown in Figure 2 above. The results showed that there was a statistically significant difference in the chlorophyll content of S. aethiopicum kept in the three different storage conditions and between RI and RC in each day of storage (P ≤ 0.05). The light intensity in the charcoal cooler and cold room was relatively low hence reducing on the rate of chlorophyll degradation.

S. aethiopicum RC-AC showed the most rapid increase in the percentage weight loss. There was variation between the percentage weight loss RC-CR, RC-CC, RC-AC, RI-CR, RI-CC and RI-AC for each day in the five days of storage which was significant (P≤0.05). The first indicator of deterioration is the moisture loss, weight loss due to moisture loss and yellowing due to ethylene production.

Conclusion
Deterioration of S. aethiopicum occurs more rapidly when the roots are cut-off. The freshness of the vegetable can be maintained by immersing the leaves intermittently in portable water. Therefore, the stored S. aethiopicum must be kept away from contact with water to prevent rotting. This makes the charcoal cooler a better affordable storage technology. The vegetables have no contact with water yet it maintains a high relative humidity required.


Financial support by EU (PAEPARD/CRFII) through FARA is acknowledged.