

Abstract

Tissue culture (TC) has gained prominence in propagation of vegetative crops. The technology is important as it enables production of disease-free planting materials on a timely basis. However, its adoption among small scale farmers is limited by the high cost of production. It is therefore important to develop strategies that will make TC products affordable. This project sought to develop low cost TC protocols for sweet potato and cassava varieties. The feasibility of using locally available fertilizers as an alternative source to Murashige and Skoog (MS) nutrients was evaluated. Two protocols were developed for each crop. Two varieties of each crop (Muchericheri and KME 1 for cassava; KEMB 36 and Tainung for sweet potato) were subjected to three treatments with different media composition and replicated nine times. In the first medium (LCM 1), Easygro® vegetative fertilizer (27:10:16 (N: P: K) + microelements) was used as an alternative source for MS basal salts. In the second media (LCM 2), the conventional sources of four MS macronutrients were substituted individually with locally available fertilizers while Stanes Iodized Microfood® was used as the low cost source of micronutrients. Table sugar was used as an alternative source of carbon while conventional MS medium (CM) was used as the control. The use of LCM 1 for cassava micropropagation led to a reduction of 96.3% in the cost of the nutrient sources while LCM 2 led to savings of up to 95.5%. For sweet potato, a cost reduction of 96.9% was realized with LCM 1 while LCM 2 led to cost reduction of 94.4%. The two cassava varieties had regeneration indices of 3-7 nodes per plantlet on all the media. Sweet potato varieties had regeneration indices of 2.9-7.8 nodes per plantlet across the media. This study has shown that it is possible to reduce the cost of cassava and sweet potato tissue culture by adopting alternative nutrient sources.