

## Abstract

Smallholder dairy farming is important in Kenya, however reducing farms into subdivisions over the past four decades has resulted in small farms. Meeting the nutritional requirements of high yielding dairy cows is now a constant challenge to the farmers especially during the dry season. Sweetpotato is a potential source of food and feed for smallholder farmers. The high biomass yield and quality of sweetpotato storage roots and vines are two of the most important factors that deserve attention when it is used as a feed. The present study evaluated six cultivars of sweetpotato for their potential as dual-purpose crops, biomass yield, and quality in different agroecological zones in Kenya. Six cultivars of sweetpotato were grown on farms in five sites located in the Central, South, and North Rift Valley regions of Kenya under rain-fed conditions. Two sites each were located in the high and medium altitude area while one was located in the low altitude area. All sites have a warm climate except the one at high altitude that experiences a cold climate. The cultivars were 103001, Gweri, Kemb-23, Kemb-36, Naspot-1, and Wagabolige. The vines of each variety were harvested at two different stages (75 and 150 days) post-planting. The 75-day treatment was ratooned again at 150 days post-planting. Agronomic observations were carried out during the long rainy season in 2010. Harvesting vines twice significantly ( $P < 0.001$ ) increased forage yields but significantly reduced root yield in all the varieties. Gweri variety realized the highest forage yield but the lowest storage root yield indicating its potential as a forage variety. Kemb23, Kemb36, and Naspot1 produced appreciable amounts of vines and the highest root storage yield showing their potential as dual-purpose varieties. The effect of cultivar on forage yield varied with time of harvest. There was a high interaction between the cultivars and stage of harvest at 150 days after planting. Gweri, Kemb 23, and Kemb 36 showed some level of interaction with stage of harvesting at 150 days after planting. Across AEZs vine yields (t/DM/ha) ranged from 0.9 t/ha at high altitude (dry), 2.4 at high altitude (wet), 1.7 at low altitude (dry), and 2.8 medium altitude (wet). The root to vine ratios (R/V) obtained classifies cultivar 103001 as a low forage-high storage root cultivar while Gweri was classified as a forage cultivar in all AEZs. Four other varieties (Kemb-23, Naspot-1, Wagabolige, and Kemb 36) were identified as “best bet” dual-purpose varieties. Harvesting sweetpotato plants twice at 75 and 150 days post-planting increased vine yield by 34 % but also reduced tuber yields by 54 %. The practical implications of these results is that farmers in each AEZ will have at least one suitable forage, dual-purpose or root variety to choose from depending on the feed needs on farms.