Genetic Evaluation of Sweet Potato Vine Genotypes

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Introduction Sweet potato vines (ipomea batatas) have been reported to be an important source of crude protein (19 .5/CP) with digestibility of 80% (Irungu et al . , 2004) . According to Irungu the vines significantly improved intake in sheep ($P<0.01$) and stimulated digestion of low protein forages . The sweet potato vines therefore can form a major source of nutrients to livestock . They adapted well to wide environmental conditions and require low soil fertilizer , and have few pest & disease infection . The objective of this study was to identify , evaluate and select genotypes with traits of high dry matter content , crude protein (CP) , vigorous morphological characteristics , drought tolerance and resistance to pests and diseases .

Materials and methods Evaluation of ten vine types from a population of twenty three genotypes identified as potential vine types (Ondabu et el . 2004) was conducted at Lanet Research Centre . Lanet Research Centre is situated at an altitude of 1920m above sea level and receives 800mm of rainfall per annum . The soil is deep loam with an average maximum and minimum temperatures of 26℃ and 10℃ , respectively . The experiment used a randomized complete block design (RCBD) on plots measuring 3 × 5 m and replicated three times using a flat planting method . Vine spacing was maintained at 60 × 30 cm . Routine agronomic practices were applied . Harvesting was done after 90 days for laboratory analysis . The dry matter content was determined by drying samples in an oven at 105℃ for 24 hours . Crude protein was determined according to official methods of Association of Analytical Chemists (AOAC 1990) . Morphological characteristics were determined by measuring leaf width , length and vine circumference using a flexible tape measure . A sample of 100 vines and leaves were measured from each block . Data collected were subjected to analysis of variance using Genestat (1988) . The means were separated by the least significant difference (LSD) .

Results

Table 1 *Dry matter , crude protein , leaf and vine measurements of ten sweet potato vine cultivars .*

Cultivar	DM%	CP%	Leaf length	Leaf width	Vine circumference	
Sample size	10	10	100	100	100	Tuber weight per sq m
99/1	13 .6^{e}	22 .6^{a}	12 .0^{c}	8 .4^{f}	2 .5^{b}	2 .7
Ex-mukuruini	11 .9^{g}	18 .6^{f}	10 .5^{e}	11 .5^{b}	3 .0^{a}	1 .0
Helena	16 .0^{c}	19 .8^{c}	12 .0^{c}	13 .0^{a}	3 .3^{a}	5 .0
K049	18 .2^{a}	21 .3^{b}	11 .0^{d}	9 .3^{d}	3 .0^{a}	0 .5
K158	16 .5^{b}	19 .5^{d}	13 .7^{a}	11 .6^{b}	3 .0^{a}	0 .2
Kemb-10	12 .2^{f}	16 .4^{j}	8 .6^{g}	7 .3^{g}	2 .6^{b}	1 .5
Kemb-36	9 .7^{i}	16 .9^{h}	8 .6^{g}	7 .5^{g}	3 .1^{a}	1 .0
Light green	10 .2^{h}	16 .5^{i}	9 .3^{f}	8 .8^{e}	2 .3^{b}	3 .3
Marooko	14 .6^{d}	18 .8^{e}	12 .0^{c}	10 .0^{c}	2 .5^{b}	1 .5
Wagabolige	14 .6^{d}	18 .4^{g}	12 .4^{b}	13 .0^{a}	3 .4^{a}	0 .9
LSD	0 .22	0 .06	0 .2	0 .2	0 .2	

Means within columns with different scrips are significantly different ($P<0.01$)

Conclusions Dry matter , crude protein contents and morphological characteristics of the ten genotypes showed high variability . Genotype K049 had significantly high DM content while genotype 99/1 and K049 had significantly high protein content . All ten genotypes had CP content of more than 16 .4% and are suitable as protein supplements to grass based ruminant diets . Genotypes Wagabolige and Marooko manifested significantly high morphological characteristics , had low weed infestation , tolerant to prolonged drought and had no disease attacks .

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