

Socio-economic constraints and the production, processing, and marketing of sweet potato in Kumi District, Uganda.

J. Mudiope¹, H. Kindness² and V. Hagenimana³

International Potato Center, P.O. Box 750, Soroti, Uganda¹, Natural Resources Institute, University of Greenwich, UK², and International Potato Center, P.O. Box 25171, Nairobi, Kenya³

Abstract

Kumi District is one of the major sweet potato growing area of Uganda, and the crop is grown both as a cash crop and for food security. Although sweet potato is very important in the food system, little documentation on the production, storage, processing and marketing is available for the area. To explore the current role of sweet potato in the specific farming system of Kumi and identify socio-economic constraints affecting the production, processing and marketing, we conducted a survey in 120 households of Kumi Sub-County using informal and formal questionnaires. The results indicated the adequacy of farmers' cultural practices in the production of sweet potato. Cultivar Tanzania was found being monoculturally grown in each household of Kumi Sub-County. Major sweet potato production constraints were related to high labor cost and inadequacy of availing the planting material after the long dry season. Expanded use of simple rapid multiplication techniques and the feasibility of efficiently and economically bulk and produce the healthy planting material from available swamps are some options being tested in the region.

Key words: Cultural practices, marketing, sweetpotato production, food security

Introduction

Sweet potato (*Ipomea batatas* (L.) Lam.) is a major food staple in Uganda. The crop is grown throughout the country as a subsistence food crop (Bashaasha, 1995) and in North-eastern Uganda, it's value is increasingly more pronounced as a major cash crop (MAAIF, 1996). Despite it's importance, there is little documentation on sweet potato constraints in the region. Elsewhere, the available information suggests constraints affecting production, marketing, processing and storage of sweet potatoes. Notable among production constraints, Mutuure *et al* (1992) mentioned sweet potato weevils, drought and lack of planting materials as common problems in a survey carried out in Kenya. Additionally, labour shortage, lack of farm implements, land scarcity were hinted on by Bashaasha *et al.* (1995) in Uganda while, in addition to these, low soil fertility and vertebrate pests of moles, rats and pigs (Kapinga *et al.*, 1995) were also, but sparsely reported in the Tanzania farming system.

During marketing, low price (Bashaasha, 1999), lack of market, high labour costs and inavailability of transport (Bashaasha *et al.*, 1995) were cited as common bottlenecks but with imperical data missed out. While information on processing and storage is still very scarcely documented and only Bashaasha (1999) has generally listed weather fluctuations, inadequate marketing system and labour shortage in processing as limitations in post harvest handling of processed sweet potato products. Unfortunately, information on the common storage pests has not even been cited (**Dr. Vital please help with info. on this**)

In reaction to the numerous crop constraints, sweet potato farmers mainly apply cultural control measures that are effective in increasing and sustaining sweet potato production. Smit and Matengo (1995), listed use of clean planting materials, keeping a distance between plots, crop rotation, suitable time of planting and harvesting, field sanitation, hilling up and fertiliser management as effective control techniques among the farmers. It is worth noting that these practices are more inclined and adequate in alleviating production problems, unfortunately, they do not address the constraints of labour shortage and lack of planting materials. It is therefore necessary to widen and conduct research in this region and include strategies that

would effectively simplify availability of planting materials in time and ease labour needed in sweet potato production.

Materials and methods

The study was conducted in Kumi sub-county of Kumi district where sweet potato is a major crop in the farming system. Kumi district is found in North-eastern Uganda at an altitude of 1,244 m above sea level and is ca. 271 km from Kampala. In the district, rainfall is bimodal with a mean average of 421.25 mm annually and the annual mean temperature is (27°C). Six villages from 3 randomly selected parishes of the sub-county were used in the study. The villages were Kabata and Amejjei (Kabata parish); Olupe and Asinge (Olupe parish); and Okouba and Omolokonyo (Okouba parish). For every village, a wealth ranking exercise was conducted together with the chairman, the women and the youth leaders of the village so as to stratify the population into rich, moderately rich and poor. In each village an informal survey was conducted and later, a representative sample of 20 members from the different wealth categories was then taken randomly and interviewed individually using a formal questionnaire. The data obtained were entered and analysed in Statistical Package for Social Scientists (SPSS) using descriptive analysis of cross tabs and frequencies represented in graphically.

Results

Constraints

Production constraints were regarded as the major limitations with 48.3% ranking them as either the first or second major constraint in sweet potato farming (Table 1). During production, several limitations were mentioned hindering increased and sustainable sweet potato production. Among the constraints, 40.9% of the farmers said that labour shortage is either their first or second biggest bottleneck followed by lack of planting materials (24.6%). Other production constraints the respondents mentioned as important were pests (especially weevils), prolonged drought, poor soils, land shortage and lack of tools (Table 2).

In marketing, low price for the sweet potatoes was regarded as the major bottleneck and 42.5% ranked it as either the first or second limiting factor in sweet potato marketing (Table 3) followed by lack of organised market which is characterised by middlemen. Taking on credit with subsequent delayed or no payment and lack of transport were other bottlenecks mentioned in marketing sweet potatoes in Kumi sub-county (Table 3). Several constraints were said to affect processing and storage of sweet potatoes which include storage pests (locally called *espirani*), high costs of storage bags and lack of processing tools among others. Among these, storage pests were regarded as the major limitation and Table (4) indicates that 45.4% rated storage pests as either the first or second major constraint in the post harvest handling of sweet potato products by the farmers.

Farmers' cultural practices

Several cultural practices were mentioned as useful in alleviating production constraints. Variety selection before planting is almost done by all the farmers (99.2%), while crop rotation, and weeding are done by all the respondents interviewed. Hilling-up, which involves adding more soil to the base of the plant during weeding is also a common practice by many farmers (76.7%) (Table 5). Overall, 60.8% of the interviewees observe field sanitation. Though some few do adjacent planting, the majority (69.2%) of the farmers avoid this practice. Another common practice (75.8%) done to reduce sweet potato production constraints is improving on the soil fertility which was commonest in Amejjei village (85.0%) and lowest in Omolokonyo (60.0%). Some farmers (55.0%) mentioned that they separate domestic from commercial plots (Table 5). The results of the survey also indicated that farmers observe planting seasons and the majority (85.0%), plant bigger acres in the first

season than in the second (Table 6) mainly because there are sufficient rains (50.8%) for storage root formation and development in the first season than in the second.

In Kumi sub-county, farmers select varieties before planting mainly because they prefer planting marketable varieties and a few respondents said that they prefer planting varieties (Fig. 1) that give high yields per unit area. Crop rotation is another management practice done by all the respondents surveyed. Among the farmers surveyed, 95.8% said that they practice crop rotation to increase fertility, 3.3% said that they want to break pest cycles while 0.8% rotate crops for both reasons mentioned (Fig. 2). Other management practices of hilling-up (Fig. 3), field sanitation (Fig. 4) and avoiding adjacent planting (Fig. 5) are basically practised to control pests while manure application is mainly for improving on soil productivity (Fig 6).

Discussion

Much as sweet potato is a crop known to grow in soils with marginal fertility and under fluctuating weather conditions (**reference, 19xx**), like any other crop, it suffers but mainly production constraints (Mutuure *et al.*, 1992). Results in Table (2) highlighted labour and planting vines shortage, pests, prolonged drought and low soil fertility as the common problems in production. Nevertheless, some of the constraints faced in Kumi sub-county are being handled at farmers' level through use of cultural practices that provide favourable environment for plant growth. However, most of the current practices are concentrated on controlling pests (hilling-up, field sanitation, avoidance of adjacent planting and early harvesting); maintaining soil fertility (crop rotation and manure application) and; increasing yields (variety selection and planting season) and do not address the major constraints of labour and planting material shortages. For example, Smit (1997) reported that hilling-up is a direct weevil control method where soil cracks are filled and exposed storage roots covered with soil, thereby blocking the way for weevils to the storage roots but again this is an extra labour expense. Also, Smit and Matengo (1995) mentioned neighbouring fields to be a very important weevil infestation source therefore, through avoidance of adjacent planting, farmers reduce on the suitable environment that is favourable for the survival of the sweet potato weevils. Contrarily, some farmers said that having adjacent plots reduces on the labour needed to work in different fields. The farmers interviewed appreciated that they enjoy an early market and so harvest early thereby escaping high yield losses due to sweet potato weevils. It is known that late harvested potatoes suffer more weevil damage than those harvested as soon as they are mature (Nawale, 1981; Talekar, 1991). Despite this advantage, some farmers can not harvest early because they usually lack health planting materials that mature in a shorter time.

Conclusions and recommendations

Farmers in Kumi sub-county have concentrated on pests, fertility and yield problems and little has been done on constraints of labour and planting material shortages. This has caused lack of labour and planting materials to be very important bottlenecks in the region. Much as limitations like sweet potato weevil are important if not controlled (Smit, 1995), there is urgent need for both researchers and farmers to explore the possibilities of alleviating shortages of labour and planting materials in sweet potato production. For instance, currently in North-eastern Uganda, there is a joint on-going research by CIP/NRI/NARO. Part of this project is focusing on expanded use of simple rapid multiplication techniques plus efficient and economical production of healthy planting vines from available swamps. RMT helps to reduce the time taken for vines to mature in the nursery. It is also thought that planting vines multiplied from swamps mature faster and are weevil free as compared to materials developed from other sources such as volunteers.

Acknowledgement

References

Table 1: Ranked general sweet potato constraints in Kumi sub-county

Village	Production		Marketing		Storage & processing	
	Rank1	Rank2	Rank1	Rank2	Rank1	Rank2
Kabata	55.0	30.0	40.0	30.0	0.5	40.0
Amejei	65.0	30.0	35.0	60.0	0.0	10.0
Olupe	60.0	40.0	40.0	50.0	0.0	10.0
Asinge	80.0	20.0	20.0	60.0	0.0	20.0
Okouba	85.0	15.0	15.0	75.0	0.0	10.0
Omolokonyo	80.0	20.0	20.0	75.0	0.0	5.0
Ranked 1st or 2nd	48.3		43.3		8.3	

Table 2: Production constraints ranked by farmers in Kumi sub-county

Village	Labour shortage	Planting material	Pests	Drought	Poor soils	Land shortage	Lack of tools
Kabata							
Rank1	55.0	30.0	5.0	5.0	5.0	5.0	0.0
Rank2	35.0	45.0	5.0	0.0	5.0	5.0	0.0
Amejei							
Rank1	50.0	15.0	10.0	10.0	10.0	5.0	0.0
Rank2	30.0	25.0	35.0	0.0	5.0	5.0	0.0
Olupe							
Rank1	60.0	15.0	0.0	10.0	0.0	5.0	5.0
Rank2	25.0	40.0	5.0	0.0	5.0	10.0	0.0
Asinge							
Rank1	55.0	20.0	0.0	25.0	0.0	0.0	0.0
Rank2	30.0	40.0	5.0	10.0	10.0	0.0	5.0
Okouba							
Rank1	40.0	10.0	10.0	30.0	10.0	5.0	0.0
Rank2	25.0	15.0	45.0	0.0	5.0	0.0	5.0
Omolokonyo							
Rank1	40.0	20.0	0.0	30.0	0.0	5.0	0.0
Rank2	45.0	20.0	20.0	5.0	5.0	5.0	0.0
Ranked 1 or 2	40.9	24.6	11.6	10.4	5.0	4.2	1.3

Table 3: Marketing constraints ranked by farmers in Kumi sub-county

Village	Low price	Lack of organised markets	Take on credit	Lack of transport
Kabata				
Rank1	65.0	20.0	5.0	5.0
Rank2	30.0	10.0	25.0	10.0
Amejei				
Rank1	55.0	35.0	5.0	5.0
Rank2	35.0	30.0	5.0	15.0
Olupe				
Rank1	30.0	50.0	5.0	10.0
Rank2	40.0	10.0	5.0	25.0
Asinge				
Rank1	55.0	20.0	25.0	0.0
Rank2	30.0	15.0	30.0	20.0
Okouba				
Rank1	55.0	30.0	10.0	5.0
Rank2	30.0	30.0	20.0	0.0
Omolokonyo				
Rank1	65.0	25.0	10.0	0.0
Rank2	20.0	20.0	35.0	15.0
Ranked 1st or 2nd	42.5	24.6	15.0	8.2

Table 4: Processing and storage constraints ranked by farmers in Kumi sub-county

Village	Storage pests	Expensive bags	Lack proc. tools	Other	No reponse
Kabata					25.0
Rank1	50.0	25.0	20.0	5.0	
Rank2	30.0	20.0	10.0	15.0	
Amejei					50.0
Rank1	75.0	10.0	15.0	0.0	
Rank2	20.0	30.0	0.0	0.0	
Olupe					40.0
Rank1	80.0	5.0	0.0	10.0	
Rank2	15.0	15.0	20.0	10.0	
Asinge					10.0
Rank1	85.0	10.0	5.0	0.0	
Rank2	10.0	30.0	10.0	40.0	
Okouba					40.0
Rank1	70.0	15.0	5.0	10.0	
Rank2	10.0	0.0	20.0	30.0	
Omolokonyo					65.0
Rank1	95.0	0.0	5.0	0.0	
Rank2	5.0	20.0	5.0	5.0	
Ranked 1st or 2nd	45.4	15.0	9.6	10.5	38.3

Other factors include lack of market, lack of storage tools and fluctuating weather conditions that facilitate pest outbreak.

Table 5: Percentage response on use the different cultural practices in Kumi sub-county

Village	Variety selection	Hilling-up	Field sanitation	Adjacent planting	Fertility measures	Separate domestic from commercial plots
Kabata	100	95.0	60.0	45.0	75.0	70.0
Amejei	100	100.0	55.0	55.0	85.0	60.0
Olupe	100	70.0	70.0	20.0	80.0	50.0
Asinge	100	100.0	85.0	25.0	80.0	45.0
Okouba	100	100.0	70.0	15.0	80.0	35.0
Omolokonyo	95.0	100.0	25.0	25.0	60.0	70.0
Mean	99.2	94.2	60.8	30.8	75.8	55.0

NB: All the farmers practice crop rotation and weeding

Table 6: Percentage response to planting season

Village	Planting season		Reasons for planting bigger acreage in first season		
	First	Second	Sufficient rains	Trap market	Both
Kabata	90.0	10.0	45.0	0.0	40.0
Amejei	90.0	10.0	65.0	5.0	20.0
Olupe	100	0.0	60.0	10.0	30.0
Asinge	90.0	10.0	50.0	5.0	35.0
Okouba	75.0	25.0	50.0	0.0	25.0
Omolokonyo	65.0	35.0	35.0	5.0	25.0
Mean	85.0	15.0	50.8	4.2	29.2

NB: The few farmers who plant in second season said that they lack planting materials to plant the first season

Fig. 1: Reasons for variety selection at planting

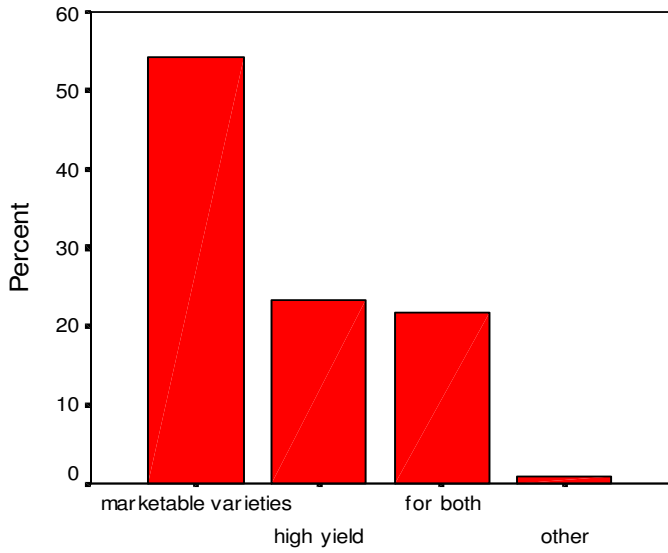


Fig. 2: Reasons for crop rotation

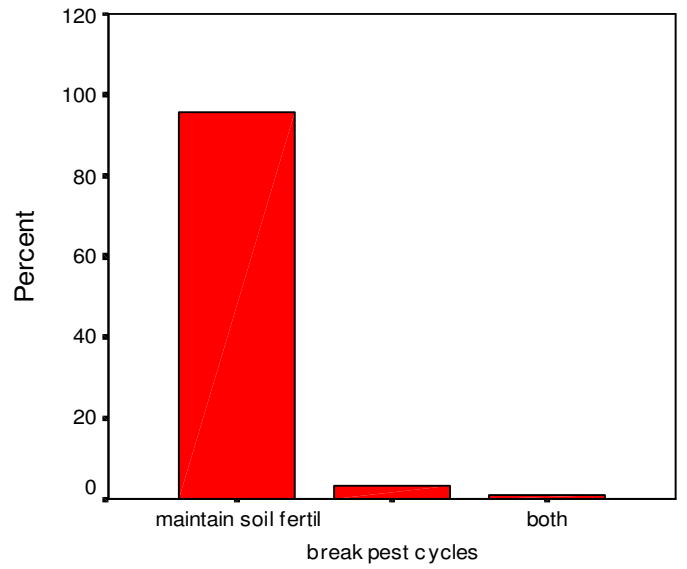


Fig. 3: Reasons for hilling- up

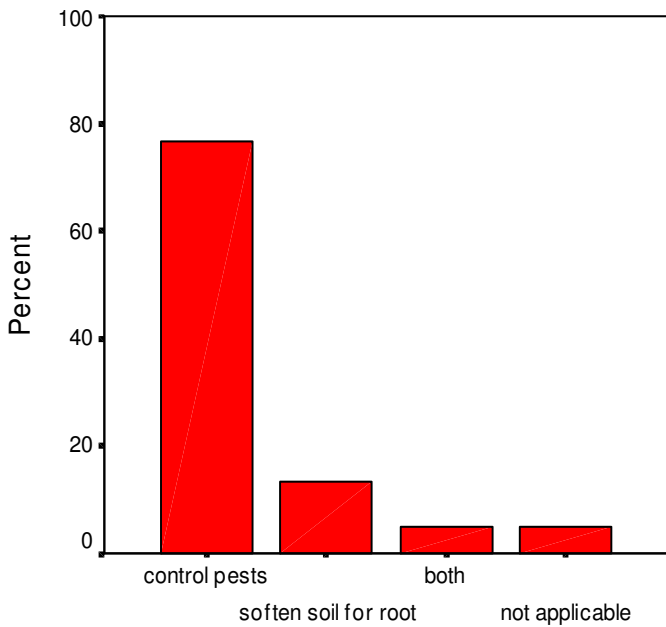
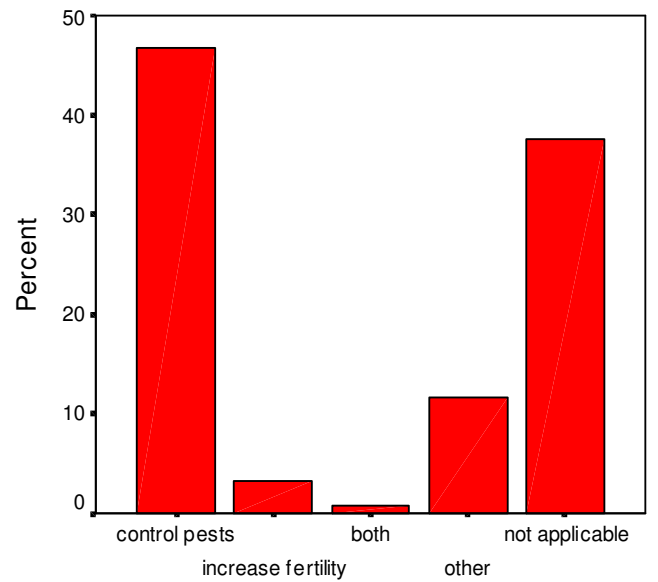


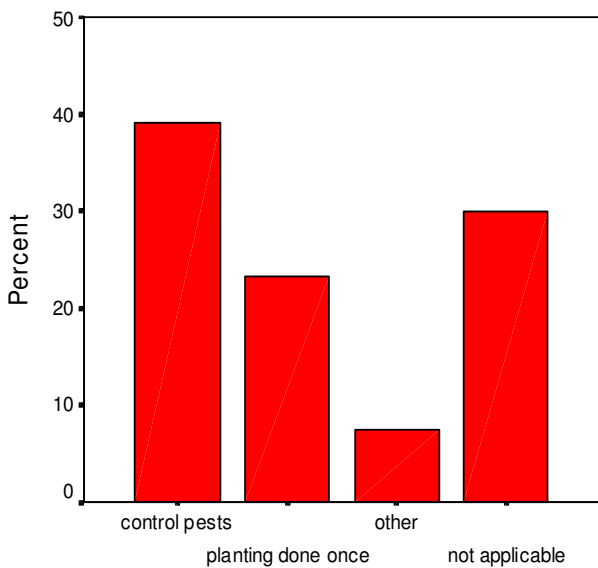
Fig. 4: Reasons for field sanitation



Reasons

Reasons

Fig. 5: Reasons for not practicing adjacent planting



Reasons

Fig.6: Percentage response to soil fertility measure

