

Short Communication

Profitability in the use of sweet potato crop as soil conservation strategy in Umudike, Abia State, Nigeria

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An experiment was conducted in August 2004 and July 2005 at National Root Crop Research Institute (NRCRI) Umudike crop production farm to evaluate the profitability of sweet potato production as a strategy for soil conservation. The data were collected for 4 months from land clearing to sales using cost-route approach. The study evaluates the costs and returns in sweet potato production using basic statistics and profitability models. The results on cost of resource inputs showed a total production cost of ₦149, 355.20. Labour input, sweet potato vine, land preparation constituted 30.93, 26.96 and 9.71% of the total production cost, respectively. Despite the high production costs, the results of farm budgeting showed a gross return of ₦274, 054.00 and net profit of ₦124, 698.80. Thus, farmers are encouraged to go into the production of sweet potato, as it is profitable when use in conserving the farmland.

Key words: Sweet potato, profitability, soil conservation, Umudike, Nigeria.

INTRODUCTION

Sweet potato is an important root crop grown in Nigeria, usually matured in about 90 days. The crop serves as a cover crop, which prevents soil run-off and also a source of carbohydrate that is used as supplementary diet to yam and cassava (Janssens, 2001). The fresh tuber of sweet potato and the leaves can be fed to livestock (Onwueme et al., 1991). The crop could be regarded as poverty reduction crop as it requires little inputs to establish in a fragile soil. In Nigeria, many farmers today do not make conscious efforts to conserve the soil. This may not be unconnected with the thinking and attitude that farmland is inexhaustible (Nnabude, 1999). Also, the average farmer today is perhaps not convinced that soil conservation brings about an improvement in soil quality and increase in crop productivity even in the short term (Babalola, 2000). The crop can be planted in erosion prone area to protect the farmland at the same time provides income to the farmer. It can also be planted in ridge, bed, mound, or even in zero or flat land and in rice field after rice has been harvested at a small cost.

The price for a vine of sweet potato is about ₦1.00 for white flesh varieties from commercial growers while it

cost little or nothing from fellow rural farmers. An earlier work done by some researchers (Eluagu et al, 1989; Asumugha, 1999) shows production costs to be ₦3244.00 and ₦29847.80. Obviously, this has been overtaken by deregulation of the oil sector in Nigeria which led to an increase in cost of resource inputs in sweet potato production. However, sweet potato production as a measure of soil conservation has been reported as one of the solutions in farmland management for poverty reduction (Asawalam and Chukwu, 2000). Evidence shows that applying the concept of agro-diversity to indigenous soil conservation farming practices is a way of spreading risk and supporting food security in resource-poor farming systems (Tenerberg et al., 1998). Thus an attempt is made to evaluate the profitability of sweet potato production used as a measure for soil conservation in the study area.

METHODOLOGY

The study was investigated at Eastern farm of National Root Crops Research Institute (NRCRI), Umudike (05° 29'N, 07° 33'E) in an erosion prone area. The trial was conducted in 2004 and 2005 cropping seasons, in a multiplication farm using TIS87/0087 Variety. The choice of this variety was deliberate because it has shown a high yield land-covering tendency. The average yield of this variety

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Table 1. Estimated cost of resource inputs in sweet potato production in Umudike during 2004/2005 cropping seasons.

Resource input/ha	Quantity	Unit cost (₦)	Total cost (₦)	Percentage
Land preparation (tractor services)	-	-	14,500.00	9.71
Labour (231 persons)	231	200.00	46200.00	30.93
Sweet potato (vine) B/d	333	120.00	39960.00	26.76
Fertilizer requirement (kg)	250	136.00	9000.00	6.03
Transportation/fuel (Lt)	40	68.00	2720.00	1.82
Interest on capital (9%)	-	-	10114.20	6.77
Total variable cost (TVC)	-	-	12500.00	82.02
Rent (land) Ha	1	-	12500.00	8.37
Depreciation (hand fork, bags etc)	-	-	961.00	0.67
Family labour (harvesting of vines)	-	-	13400.00	8.97
Total fixed cost (TFC)	-	-	2 6861.00	17.98
Total cost (TVC + TFC)	-	-	149355.30	100.00

Table 2. Farm budgeting results in sweet potato production Umudike during 2004/2005 cropping seasons.

Revenue/cost	Yield (t/ha)	Unit Cost (₦)	Return (₦) ha
High price tubers (HPT) >0.1 kg	10.311	14,000.00	144,354.00
Low price tubers (LPT) <0.1 kg	0.970	10,000.00	9,700.00
Sweet potato vine (bundle)	1000.00	120.00	120,000.00
Land productivity	11.281	-	-
Labour productivity (kg/person)	13.39	-	-
Gross return	-	-	274,054.00
Net return	-	-	124,698.80
Return per naira	-	-	83%

was 41.48 tons per hectare (NRCRI, 1991). The crop was planted on ridge on 1 ha field with 0.3 m x 1 m spacing. The crop was harvested at 4 months after planting. The data were collected using cost-route approach. The data collected include labour records, fertilizer requirements, planting material, working implements, costs, yields and farm gate prices. Some relevant measures such as kilogram, man-day, ton, and hectare were used to compute some variables. The analytical approach or model used for achieving the objectives of this study were basic statistics such as tables, mean, percentage, and profitability model (Ezeh, 1998; Jirgi and Baba, 2001; Ogbonna and Ezedinma, 2005). This was expressed as follows:

$$NR = GR - TC$$

$$R/N = NR/TC$$

Where NR = net return, GR = gross return, TC = total Cost, R/N = return per naira.

RESULTS AND DISCUSSION

Table 1 shows the costs of resource inputs and as well as non-expenditure inputs (fixed assets). A total cost of ₦149, 355.20 was incurred in sweet potato production. The shared of total variable cost was ₦122, 494.20

(82.22%) while the total of non-expenditure cost was ₦26, 861.00. The rise in sweet potato production is attributed to an upward shift in the prices of goods in the economy, which have multiplier effects. Labour input contributed 30.93% of the total production cost while cost of sweet potato vine has a share of 26.76%. Land preparation (tractor services) has a share of 9.71%, indicating that these input requirements were the major production constraints.

The contribution of non-expenditure cost was ₦26, 861.00 (17.98%) of total cost of production. These are inputted costs. The result on farm budgeting analysis (Table 2) shows a land productivity of sweet potato as 11.281 tons per hectare and labour productivity as 13.39 kg per man-hour per hectare. About 10.311 tons and 0.970 tons per hectare were obtained from high price tuber (HPT) and low price tuber (LPT), which accounted for ₦144, 354.00 and ₦9, 700.00, respectively. The sale of sweet potato vines (1000 bundles) was worth ₦120, 000.00 given a total gross return of ₦274, 054.00 and a net return of ₦124,698.80 per hectare. Thus, the return per naira per hectare was 83%, implying that the farm enterprise realize a share profit of ₦0.83 kobo for every ₦1.00 employed in sweet potato production.

Conclusion and policy implications

Though the cost of labour and sale price for tubers was subsidized, the study serve as a basis for feasibility on a well managed farm. The study was able to establish that 11.281 tons per hectare was realized as yields from tubers and 1000 bundles from sales of sweet potato vines, all given a gross income of ₦274, 054.00. The production cost was established as ₦149, 355.20. Thus, given the costs and returns figures, it could be concluded that sweet potato production is profitable. Hence, it is recommended that farmers should embark on the business since sweet potato production is profitable. For the guidance of a sweet potato producer, the after harvest i.e. the vines could be kept in nursery at nearby streams or behind the kitchen for next season planting to reduce cost on planting materials. Farmers/producers should ensure that while maximizing profit, they should also minimize cost of inputs to enable them allocate resources efficiently as total cost of production seems higher. Beside, farmers / producers should note that one does not need to have all the required inputs before one can be a sweet potato producer. For instance, a reasonable quantity of poultry manure can be used in place of inorganic manure (fertilizer) in order to reduce cost. Equally family labour could be used in place of hired labour in areas where there are scarcities of labour or high wage rate. Again the cost on tractor services can be substituted in place for flat planting.

REFERENCES

- Asawalam D, Chukwu.G (2000). Environment, Agricultural Sustainability and Poverty Alliviation in Southeastern Nigeria. In: Agricultural Transformation in Nigeria. AC Nwosu, C.U.Nwajiuba and J.A Mbanasor (eds). Proceedings. of a National conference in Honour of Prof. MO Ijere. Federal University of Agriculture Umudike. 24-26th Aug. 1999. pp. 197-203.
- Asumugha GN (1999). Rate of Return on improve Sweetpotato Production in the forest zone of Nigeria. Nig. Agric. J. vol. 30: 108-114.
- Babalola O (2000). Soil Management and conservation in Nigeria. In: Agronomy in Nigeria. MO Akoroda (ed). pp. 216-222.
- Eluagu LS, Okonkwo JC, Ikeorgu J, Ugwu BO, Ene LSO (1989). Economics of Sweetpotato production using improved management systems. In: NRCRI, Annual Report, 1989. NRCRI, Umudike, Nigeria. pp. 52-54.
- Ezeh NOA (1998). Economics of production and postharvest technology. In: Food yams: Advances in research. Okwor GC, Asiedu RA, Ekanayake IJ eds. NRCRI, Umudike/IITA, Ibadan, Nigeria. pp. 187-214.
- Jirgi AJ, Baba KM (2001). Economics of Crop Production in Traditional Farming in Northern Nigeria: A case study of Dundaye village in Sokoto state. In: The role of Agriculture in Poverty Alleviation. Abubakar MM, Adegbola TA, Butswat ISR eds. Proceedings of the 34th Annual Conference of the Agricultural Society of Nigeria, held at Ahmadu Bello University, Zaria, Oct., 15-19, 2000. pp. 41-47.
- NRCRI(National Root Crops Research Institute) (1990). NRCRI Annual Report 1991. NRCRI, Umudike, Nigeria.
- Nnabude PC (1999). A review of Soil conservation Methodology for resource-poor farmers and their application to the Nigerian situation. Presented at the 25th Annual Conference of the soil Science Society of Nigeria.
- Ogbonna MC, Ezedinma CI (2005). Economics of palm oil processing in Ihitte/Uboma, Imo State, Nigeria. In: Agricultural Rebirth for improved production in Nigeria. Proceedings of the 39th Annual conference of the Agricultural society of Nigeria, held at Uniben, Benin city, Nigeria, Oct. 9th -13th 2005. pp. 148-151.
- Onwueme IC, Sinaha TD (1991). Field Crops Production in Tropical Africa. Technical centre for Agriculture and Rural Cooperation. p. 480.
- Janssens M (2001). Sweet potato. In: Crop Production in Tropical Africa. Raemaekers, R.H ed. DGLC, Brussels, Belgium. pp. 205-221.
- Tengberg A, Ellis-Jones J, Kiome R, Stocking M (1998). Applying the concept of Agrodiversity to Indigenous soil and water conservation practices in Eastern Kenya. Agric. Ecosyst. Environ. 70: 259-272.