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AWARENESS AND UTILIZATION OF ORANGE FLESHED SWEET POTATO PRODUCTION IN EBONYI STATE, NIGERIA

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ABSTRACT

The study assessed the awareness and utilization of Orange-Fleshed Sweet Potato (OFSP) production in Ebonyi state, Nigeria. A multi-stage sampling procedure was used in selecting 120 respondents for the study. Data was collected with the aid of a questionnaire. The results revealed that the average age of the respondents was 51.2 years, and 71.6% were female, 55% were married with a mean household size of 5 persons respectively. The study further revealed that 75% of the farmers were only aware of two out of three OFSP varieties, and the level of utilization was moderate with a mean score of 2.45. The result further revealed that 81.7% and 71.7% of farmers were constrained by the unavailability and high cost of planting materials, while 65.8% and 65.0% were constrained by the high cost of fertilizer and high cost of labor respectively. Therefore, the study recommended that there was a need to create more awareness and increase the adoption and utilization of OFSP to improve food security and nutrition in Ebonyi state, Nigeria.

Keywords: *Orange-Fleshed Sweet Potato (OFSP), Food security, Vitamin A deficiency*

INTRODUCTION

Orange-fleshed sweet potato (OFSP) *Ipomea batata L* is one of the many varieties of sweet potatoes consumed locally and internationally. The high nutritive value makes it a helpful option in consuming it especially among children and pregnant women in underdeveloped nations where Vitamin A deficiency is a major concern (FAO, IFAD, UNICEF, WFP, WHO 2022). OFSP has also gained substantial recognition for its pivotal role in addressing food security and nutritional challenges in Nigeria and Ebonyi State in particular (Nwakor *et al* 2020). The orange-fleshed sweet potato varieties have been developed and disseminated by the National Root Crops Research Institute Umudike and International Potato Centre (CIP) to the southeastern region of Nigeria as a nutritional and food security crop (Nwokocha, I.N *et al* 2019, Nwakor *et al* 2019). To boost the knowledge, nutritional, and health advantages of these very important crops, training, mass communication channels, and demo farms to ADPs and farmers' fields were used to create awareness and dissemination to rural communities (Omoare, 2017, NRCRI,2020). Despite the awareness campaign raised by the National Root Crops Research Institute Umudike through the agricultural extension agents by training farmers on the nutritional and health benefits of OFSP, yet, the target audience has not been cultivating and consuming it in greater amounts, due to high cost of planting materials and consumption preference. Attaining proper nutrition is key to ensuring food security and promoting sustainable health development in Nigeria (FAO, 2017). Rural farmers must undergo a paradigm shift to adopt and accept new technologies for producing orange-fleshed sweet potatoes massively, which can maximize emerging opportunities for better nutrition and boost food security. Extensive research has demonstrated that the high beta-carotene content in OFSP contributes to improved Vitamin A intake, a vital nutrient for immune function, vision, and overall health. This nutrient density makes OFSP a potent tool in alleviating micronutrient deficiencies and reducing the prevalence of diet-related illness (Oyediran*et al* 2017, Adebisi *et al* 2020). Despite its importance in promoting food security, nutrition, income, and employment, orange-fleshed sweet potato production has not received sufficient attention in southeastern Nigeria. The low awareness and production volumes of orange-fleshed sweet potato cultivars have been major constraints to promoting and utilizing the crop in Nigeria, especially in Ebonyi State. Therefore, there is a need to raise more awareness, training, and retraining of farmers on the nutritional value and its acceptability, accessibility, and consumption patterns in the study areas. Food security is achieved when all people have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and preferences for an active healthy life (FAO, 2017). The production and consumption of food rich in Vitamin A is considered a sustainable long-term strategy to address Vitamin A deficiency (VAD), as one orange sweet potato (OFSP) gives you the Vitamin A you need each day and helps to promote healthy vision. (Mwanja*et al* 2017, Babatunde *et al* 2022). Therefore, the specific objectives of this study were to:

i. determine the level of awareness of orange-fleshed sweet potatoes in the study area.
ii. determine the level of utilization of orange-fleshed sweet potato production technologies.
iii. identify the constraints encountered by farmers in the utilization of orange-fleshed sweet potato production.

METHODOLOGY

The study was conducted in Ebonyi State Nigeria. A multi-stage sampling technique was adopted for the study. In the first stage, the two agricultural zones of the state were randomly selected. In the second stage, two LGAs were selected from each zone. In the third stage, three communities were randomly selected from each zone, resulting in a total of 12 communities.

In the fourth stage, 10 sweet potato farmers were randomly selected from each LGA, yielding a total of 120 farmers for the study.

Data were collected using primary sources, such as an interview schedule and questionnaire administered offline using the Open Data Kit (ODK) Collection app on an Android phone by trained enumerators. ODK was selected for its open-source, offline solution, real-time data transfer, increased accuracy, flexibility, data security, cost-effectiveness, ease of data management, increased efficiency, and better data visualization. Data were analyzed using descriptive statistics, percentages, and mean.

Measurement of Variables: The level of awareness of OFSP production technologies in the study area was obtained by asking the farmers to indicate whether they were aware of the stated OFSP production technologies with a response option of "YES'' and otherwise "NO''. The mean awareness percentage was obtained by adding individual percentages of OFSP production technologies and dividing them by the number of technologies. The percentages were shaped and categorized with awareness rating; 1- 65 = low awareness, 66- 100% = high awareness.

The level of utilization of OFSP technologies was captured using 3-point Likert type rating scale namely: always=3, occasionally =2, and never =1. The benchmarks were obtained; thus, 3+2+1 =6 divided by 3 to give 2.0. Mean scores of 2.0 and above implied utilization and below no utilization of OFSP production technologies.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Orange Fleshed Sweet Potato Farmers in The Study Area.

The result in **Table 1** showed that 71.6% of the respondents were female while 28.3% were males. This result is in line with Nwakor, 2019 and Nwakocha *et al,* 2019, who found that female farmers dominated sweet potato farming in Abia and Anambra States, Nigeria. The result further revealed that 55% of the respondents were married with a mean age of 51.2 years. This result implied that majority of the respondents were older farmers with experience and understanding of the health and nutritional benefits of OFSP. More so, age influences decision-making and the use of any innovation or technology. The mean household size was 5.3, which in turn will help to provide cheap labor and other agricultural activities to farmers.

In terms of farming experience, 38.3% had 16-20 years of experience, while 21.6% had 11-15 years of experience, and 16.6% had 21-30 years of experience. Only a small percentage of the respondents (8.3%) had 1-5 years of experience.

Finally, the table showed that 75% of the respondents were members of a cooperative society, while 25% were not. This indicated that cooperative membership was relatively high in the study area.

Table 1: Socioeconomic characteristics of the farmers in the study area

Variables	Frequency	Percentage	Mean
Age			
20-30	6	5	
31-40	15	12.5	
4I -50	32	26.67	
51-60	47	30.17	51.2
61-70	20	16.66	
Sex			
Male	34	28.3	
Female	86	71.6	
Marital Status			
Married	66	55	
Single	16	13.33	
Divorced	6	5	
Widowed	32	26.66	
Educational Qualification			
No Formal Education	8	6.6	
Primary	30	25	
Secondary	72	60	
Tertiary	10	8.3	
Household Size			
1-3	33	27.5	
4-6	53	44.17	
7-9	19	15.83	
10-12	15	12.50	5.3
Farming Experience			
1-5	10	8.3	
6-10	18	15	
11-15	26	21.6	
16-20	46	38.3	
21-30	20	16.6	
Cooperative Membership			
Yes	90	75	
No	30	25	

Source: Field Survey, 2022

Distribution of Respondents by Level of Awareness of OFSP / Non-Orange Varieties
The results are presented in Table 2. The table is divided into two parts, the first part is for the OFSP varieties, and the second part is for non-orange varieties.

In the OFSP varieties, three types of sweet potato were identified: UmuSpo 1, UmuSpo 2, and UmuSpo 3. From the Table, 75% of the respondents were aware of UmuSpo 1. For UmuSpo 2, 66.6% of the respondents were aware. On the other hand, only 5.0% of the respondents were aware of UmuSpo 3.

For non-orange varieties, two types of sweet potato were identified: Ex Igbariam and Nwaoyorima. The table showed that 62.5% of the respondents were aware of Ex Igbariam, For Nwaoyorima, 41.6% of the respondents were aware.

From the result, there was a higher level of awareness among respondents about the orange-fleshed sweet potato compared with non-orange varieties. This finding may be attributed to the fact that the orange-fleshed sweet potato has been the focus of several nutrition and health campaigns in the study area; highlighting its nutritional benefits in addressing Vitamin A deficiency. This result is in agreement with Nwakor *et al* (2019) who reported a high level of awareness of sweet potato technologies among farmers in Ebonyi State.

The low level of awareness about UmuSpo 3, which is an orange-fleshed variety, was a cause for concern, as it suggests that not all orange-fleshed varieties were well known. This indicated a need for further education and awareness campaigns, to increase knowledge and appreciation of the various types of sweet potato in the study area.

Table 2: Distribution of the respondents by level of awareness of OFSP and non-OFSP varieties

Varieties	Frequency Aware	Percentage	Frequency Unaware	Percentage
UmuSpo 1	90	75	30	25
Umuspo 2	80	66.6	40	33.3
Umuspo 3	6	5.0	114	95.0
Non-orange				
Ex Igbariam	75	62.5	45	37.5
Nwaoyorima	50	41.6	70	58.3

Source: field survey, 2022

Distribution of the Respondents According to Level of Utilization of OFSP Production Technologies
The result presented in **Table 3** showed the distribution of respondents based on their level of utilization of OFSP production technologies. The result indicated that planting on mounds was the most commonly utilized OFSP production technology, with a mean score of 3.52, followed by Planting on ridges, time of harvest, and site clearing with mean scores of 2.75, 2.95, and 2.81 respectively, showing they were frequently utilized by the respondents in the study area.

On the other hand, the use of improved vine and fertilizer application had lower mean scores, indicating that they are not as commonly utilized. Pest and disease control and weeding intervals had intermediate mean scores, suggesting that these technologies are somewhat utilized but not as frequently as planting on mounds or ridges.

Overall, the grand mean score of 2.45 suggests that the level of utilization of OFSP production technologies was very high, with some technologies being more commonly utilized than others. This result is in agreement with Nwakor and Amadi (2020), who reported a high level of utilization of OFSP in Abia State. Therefore results can be useful for identifying areas where there may be opportunities to promote the adoption of OFSP production technologies to improve the yield and quality of sweet potato crops.

Table 3: Distribution of the Respondents According to Level of Utilization of OFSP Production Technologies

(OFSP) Technologies	Always	Occasionally	Never	Mean Score
Planting On Ridge	60(240)	40(60)	20(30)	2.75
Use of Improved Vine	14(56)	56(140)	50(58)	2.13
Fertilizer Application	8(36)	66(102)	46(68)	1.71
Pest And Disease Control	18(50)	80(128)	20(36)	1.78
Weeding at Intervals	26(60)	80(128)	14(46)	1.95
Planting On Mounds	74(270)	36(104)	20(48)	3.52
Time Of Harvest	64(260)	40(74)	6(20)	2.95
Site Clearing	74(270)	40(48)	6(20)	2.81
Grand mean				**2.45**

Source: Field survey 2022

CONSTRAINTS TO UTILIZATION OF OFSP

The result in **Table 4** presents the distribution of respondents according to the constraints to the utilization of Orange Fleshed Sweet Potato (OFSP). The table lists the constraints in descending order of ranking. The most common constraint reported by respondents was the unavailability of planting materials, which was mentioned by 81.7% of the sample. This is followed by the high cost of planting materials, which was mentioned by 71.7% of the sample, and ranked second in frequency.

Other significant constraints identified include the high cost of fertilizer 65.8%, high cost of labor 65.0%, and storage problems 60.0%, which were ranked third, fourth, and fifth in frequency, respectively.

Less frequently reported constraints include poor marketing of the root, high cost of processing equipment, and lack of herbicides, which were ranked eighth, seventh, and sixth, respectively.

Overall, the table highlighted some of the major constraints to the utilization of OFSP, which can provide insights for policymakers and other stakeholders to develop appropriate interventions and solutions to address these issues.

Table 4: Distribution of Respondents According to Constraints to Utilization of OFSP

Constraints	Frequency	Percentage	Rank
High cost of fertilizer	79	65.8	3rd
High cost of planting materials	86	71.7	2nd
High cost of labor	78	65.0	4th
Storage problems	72	60.0	5th
Pest and diseases	51	42.5	9th
Poor marketing of the root	58	48.3	8th
High cost of processing equipment	63	52.5	7th
Unavailability of planting materials	98	81.7	1st
Lack of herbicides	68	56.7	6th
Theft	38	31.7	10th
Inaccessibility of credit facilities	18	15.0	11th

Source: Field survey 2022 (multiple responses)

CONCLUSION AND RECOMMENDATION

The level of utilization of OFSP production technologies was high. The data suggest that planting on mounds, planting on ridges, time of harvest, and site clearing were the most frequently utilized technologies. On the other hand, improved vine and fertilizer application had lower mean scores, indicating less frequent usage. The most common challenge reported by respondents was the unavailability of planting materials, followed by the high cost of planting materials, fertilizer, and labor. Storage problems and pest and disease management were also significant challenges.

To improve the adoption and utilization of OFSP production technologies, the study recommended the need for more awareness campaigns by Research Institutions, ADPs, and NGOs to increase knowledge and appreciation of the various types of sweet potatoes in the study area. Additionally, interventions should be put in place to ensure the availability of new improved varieties of OFSP planting materials at affordable prices to farmers in the study area. The study also suggests the need for training and extension services that focus on fertilizer application and improved vine planting, to increase the level of utilization of these technologies.

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