

# FARMERS' WILLINGNESS TO PAY FOR QUALITY ORANGE FLESHED SWEETPOTATO (OFSP) VINES IN NORTH CENTRAL NIGERIA: A CASE OF BENUE AND NASARAWA STATES

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## Abstract

The special nutrition need by people have shifted their focus to the adoption of Orange Flesh Sweet Potato for consumption due to its high content of Vitamin A. Sweetpotato which is one of the most important but underutilized food crops in the world have now attracted concerted efforts globally to in the past decade to feed the low-income earners across the world. This research used well structured questionnaire to collect information in examining farmers' willingness to pay for Quality Orange Fleshed Sweetpotato vines in the North Central Nigeria using descriptive statistics and tobit model in analysing the data. The results revealed they are willing to pay for OFSP vines due to its maturity period, Beta carotene and yield. The factors affecting the farmers' willingness to pay for quality orange fleshed sweetpotato vines were quality of bundles ( $P < 0.01$ ), Age ( $P < 0.1$ ), Sex ( $P < 0.05$ ), off-farm income ( $P < 0.05$ ), Distance of OFSP vines ( $P < 0.05$ ), land size ( $P < 0.05$ ), yield of OFSP ( $P < 0.1$ ), total revenue from OFSP ( $P < 0.01$ ), and disease resistant variety ( $P < 0.05$ ). In conclusion, almost all of them were willing to pay for OFSP vines despite non visitation by extension agents and lack of credit facility. Research should be carried out and more awareness should be made to improve on OFSP production especially among women and youth.

**Keywords:** Orange Fleshed Sweet Potato (OFSP), Willingness to pay and Vines

## Introduction

Sweetpotato (*Ipomoea batatas*) is among the world's most important and under-utilized food crops, covering around 3.2 million hectares in Sub-Saharan Africa (SSA), with an estimated production of 13.4 million tons of roots in 2005 (Andrade *et al.*, 2009). Only in the last decade has the crop been the focus of an intense, coordinated, global effort to realize its full potential as a source of food, feed, processed products, and income for millions of small scale farmers and low-income consumers in Africa, Asia, and Latin America (Yanggen and Naggujja, 2006). More than 95% of the global production is in developing countries, where it is mostly grown as a starch staple (FAO, 2008).

Sweetpotato plays a very important role in the food markets and its utilization has been diversified from only fresh forms (boiled and steamed) to include processed forms like dried chips, porridge flour and flour for confectionery (Carey *et al.*, 1997). The introduction of Orange Fleshed Sweetpotato (OFSP) varieties has increased demand for processed sweetpotato products especially among people with special nutrition needs like infants, expectant mothers and people living with HIV/AIDS (Yanggen and Naggujja, 2006) due to its high content of pro-vitamin A. The research therefore achieved the following Factors influencing farmers' willingness to pay for quality OFSP vines and the market potential for quality OFSP vines, it sought for ways to increase in investment in vines production and identified the target market and buyers of OFSP will be identified due to this efficient and effective marketing strategies will be developed.

Currently, there is limited trade in OFSP planting material in Nigeria. This could be due to low investment in this area arising from the fact that farmers have been relying on farmer –saved vines and on donors who subsidize the cost of quality planting material (Nakanyike, 2014). In assessment of farmers’ willingness to pay for quality sweetpotato vines, this study dwelt on understanding the characteristics of OFSP farmers, because this enables the vine producers to learn more about their potential buyers, hence the kind of farmers to target for the OFSP vine business. This helps the vine producers to develop efficient and effective marketing strategies.

A good price sensitivity analysis study requires an understanding of factors affecting farmers’ willingness to pay for quality OFSP vines in order to help the vine producers to come up with appropriate marketing strategies for virus-free sweetpotato vines. Furthermore, information regarding the market potential for quality OFSP vines guides vine producers in estimating the supply volumes and coming up with appropriate production strategies. Findings of this study will also provide useful information to stakeholders of the OFSP vine delivery system and hence will guide formation of strategic partnerships for efficient functioning of the system. Furthermore this study will guide policy makers in formulating pro-poor agricultural policies for promoting vegetatively propagated crops like OFSP.

### **Methodology**

The study was conducted in Benue and Nasarawa States, Nigeria. The two states were selected for this study due to the presence of OFSP and high incidence of sweetpotato virus disease (SPVD) in the area, hence making it more appropriate for the study. Nasarawa State is bounded in the north by Kaduna State, in the west by the Abuja Federal Capital Territory, in the south by Kogi and Benue States and in the east by Taraba and Plateau States. Networks of roads exist within the state, linking all rural areas and major towns. The Nigerian Railway Corporation (NRC) operates train services from Kuru, Gombe and Maiduguri. Nasarawa State has agriculture as the mainstay of its economy with the production of varieties of cash crops throughout the year. It also contains various minerals such as salt, baryte, and bauxite, which are mostly mined by artisanal miners. In addition, Benue State is a state in the mid-belt region of Nigeria with a population of about 4,253,641 in 2006 census. It is inhabited predominantly by the Tiv and Idoma peoples, who speak the Tiv language and Idoma, respectively. The Tiv's comprises the Etulo's while the Idoma's comprises the Ufia's (Utonkon), the Igede's, and the Agatu's. There are other ethnic groups, including the Igede, Etulo, Abakwa, Jukun, Hausa, Igbo, Akweya and Nyifon. With its capital at Makurdi, Benue is a rich agricultural region; some of the crops grown there are potatoes, cassava, soya bean, guinea corn, flax, yams, sesame, rice, and groundnuts.

In the first stage, ADP Manager was purposively selected and interviewed as key informants, in view of their broad knowledge of agricultural production issues in the area. They provided highlights concerning OFSP production in the area. The second stage was base on information from ADP Manager, where two major OFSP growing zones per state were purposively selected. A multistage sampling technique was then employed to ensure fair representation of the various farmers within the two state. Two major OFSP growing local government per zones (North-South and Central Zones) were then purposively selected. In the third stage, the Designated Vine Managers from each local government was contacted and request to provide at least 30 names of OFSP farmers per local government, from which twenty five farmers in each local government were randomly selected, making a total of 100 farmers who participated in this study.

A household survey was conducted using a questionnaire, The first section of the questionnaire constituted questions on farmers' background and socioeconomic characteristics such as age, sex, family size, education level, land access, income level of farmers, membership to farmer groups, association/farmer field schools, access to agricultural extension and access to credit. The other section included questions specific on OFSP production such as: area under OFSP production, farmer preferred OFSP varieties, income from OFSP, awareness of SPVD, presence of SPVD symptoms in farmers' gardens, access to clean OFSP vines, questions on willingness to pay for quality OFSP vines, quantities that farmers would be willing to pay for, and farmers' perception and awareness about tissue culture planting materials. The SPVD symptoms were summarized and described to farmers during the interview. Based on this description, farmers were asked whether they had ever seen such symptoms in their OFSP gardens. Farmers actually knew the symptoms, but could not associate them to SPVD.

Descriptive statistics (mean, standard deviation, median) and tobit regression analysis were used for data analysis. Tobit model was also used to analyse the factors influencing the farmers' willingness to pay for fleshed sweetpotato OFSP vines in the study area. The Tobit regression, a hybrid of the discrete and continuous dependent variable, was used to determine the effect of the explanatory variables (demographic and socio-economic characteristics) on the willingness of the farmers. The model as used by Aydin *et al.* (2009) in their study to assess producers' willingness to pay for quality water and according to Tobin (1958) and Omonona (2001) is expressed as:

$$Y_{i*} = BX_i + e_i$$

$$Y_{i*} = 0, \text{ if } Y_i = 0$$

$$Y_{i*} = Y_i \text{ if } 0 < Y_i \leq I$$

$Y_i$  is the observed dependent (censored) variable,

$X_i$  is the vector of explanatory variables,

$B$  is the vector of unknown parameters,

$e_i$  is a disturbance term assumed to be independent and normally distributed with zero mean and constant variance  $\sigma$ ; and

$I = 1, 2, \dots, n$  ( $n$  is the number of observations = 90)

The independent variables specified as determinants of the willingness to pay were defined as follows:

- $X_1$  - Quantity of OFSP Bundle
- $X_2$  - Age (Years)
- $X_3$  - Sex (male or female)
- $X_4$  - Education Level (actual number)
- $X_5$  - Household Size (actual number)
- $X_6$  - Off-Farm Income (Naira)
- $X_7$  - Membership of Association (actual number)
- $X_8$  - Distance of OFSP Vine Sources to Farm (Kilometer)
- $X_9$  - Size of Land cultivated for OFSP (Acre)
- $X_{10}$  - Yield of OFSP (Kilogram)
- $X_{11}$  - Total Revenue from OFSP (Naira)
- $X_{12}$  - Disease Resistant Varieties Technology Awareness

A normality test was done to check for normal distribution of error terms, this being a prerequisite for a reliable tobit model.

## Results and Discussion

### Demographic and Socioeconomic Characteristics of Respondents

The distribution of the respondents based on their socioeconomic and demographic characteristics were represented in Table 1. The average age of the respondents is approximately 45years. This means that

farmers that participated in the cultivation of OFSP are tending into older age which may hamper the output of the OFSP production and the need to produce it in commercial quantity.

**Table 1: Distribution of the Respondents Demographic and Socioeconomic Characteristics**

Characteristics	Frequency	Percentage
<b>Age</b>		
21 - 30	17	18.89
31 – 40	22	24.44
41 – 50	23	25.56
51 – 60	09	10.00
61 – 70	15	16.67
71 - 80	04	4.44
	<b>90</b>	<b>100.00</b>
Mean = 44.78 (14.385)		
<b>Sex</b>		
Female	20	22.22
Male	70	77.78
	<b>90</b>	<b>100.0</b>
<b>Education</b>		
No Formal Education	10	11.11
Primary	18	20.00
Secondary	33	36.67
Tertiary	29	32.22
	<b>90</b>	<b>100.00</b>
<b>Household Size</b>		
1 – 10	65	72.22
11 – 20	18	20.00
21 – 30	5	5.56
31 - 40	2	2.22
	<b>90</b>	<b>100.00</b>
Mean = 10 (6.531)		
<b>Income per month</b>		
10,000 - 20,000	51	56.67
21,000 – 40,000	26	28.89
41,000 – 60,000	6	6.67
61,000 – 80,000	0	0.00
81,000 – 100,000	7	7.78
	<b>90</b>	<b>100.00</b>
Mean = 42,344.44 (80965.09)		
<b>Off-Farm Activity</b>		
No	9	10.00
Yes	81	90.00
	<b>90</b>	<b>100.00</b>
<b>Access to Credit</b>		
No	81	90.00
Yes	9	10.00
	<b>90</b>	<b>100.00</b>
<b>Member of Association</b>		
No	22	24.44
Yes	68	75.56
	<b>90</b>	<b>100.00</b>

Source: Field Survey, 2016

The fact that most of the respondents (77.78%) were male, indicate that sweet potato production in the area is majorly male dominated activity. This is not in line with the findings of Mukasa *et.al*, (2003) and Yangen and Naggujja, (2006) who revealed that more women were involved in sweet potato production in Uganda than men. The level of education of the respondents showed that 36.67% and 32.22% had secondary and tertiary education. This means more than half of the respondents had a form of education. This can have positive effect on the rate at which farmers will be willing to go into OFSP production in commercial quantity because it is believed that education makes farmers more receptive to new technology adoption and extension advice and also able to deal with technical recommendation. The average household size of the respondents is 10 members which would be of advantage to the respondents if they are at the age which can provide adequate labour for sweet potato production. This also shows a high dependency ratio because the farmers have a high responsibility of feeding the non-working members of the household.

The mean average monthly income of the respondents is ₦42,344.44 while the high gap in the standard deviation (₦80,965.09) showed that some are cultivating potato in commercial quantity. Almost all the respondents (90%) engage in one form of off-farm income generating activity or the other. This means they have other sources of income which can be used to boost OFSP production. The farmers hardly had access to credit due to almost all of them reporting that they do not have access to credit. Also more than half of the respondents (75.56%) are members of one association or the other. This can influence their access to good quality OFSP vines.

### OFSP Production

The distribution of the respondents based on having knowledge of OFSP showed that almost all of them (95.56%) were aware of the sweet potato variety. The major source of information was from their family/friends which account for 45.56%. Other sources of information include News paper (24.44%), radio (5.56%) and other forms of information (22.22%) which were not among those listed. This indicate that there were many sources through which the farmers get information on OFSP.

**Table 2: Distribution of the Respondents by having knowledge of OFSP and Sources of Information**

	Frequency	Percentage
<b>Knowledge of OFSP</b>		
No	4	4.44
Yes	86	95.56
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Sources of Information</b>		
Radio	5	5.56
Newspaper	22	24.44
Television	2	2.22
Family/Friends	41	45.56
Others	20	22.22
<b>Total</b>	<b>90</b>	<b>100.00</b>

Almost all the respondents (98.89%) have at one time or the other planted OFSP. This means they have had adopted the technology for a long time and according to the table the major purpose of planting the OFSP is for the production of both root and vine. The root is majorly for sale and consumption while

the vine is used for propagating the OFSP. This reveals that the willingness to purchase the OFSP serves as what is encouraging the farmers to engage more in OFSP production.

**Table 3: Distribution of the Respondents by Planting of OFSP and Purpose of Planting**

<b>Purpose of Planting OFSP</b>	<b>Frequency</b>	<b>Percentage</b>
Root Production	15	16.67
Vine Production	8	8.89
Both	67	74.44
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Planting of OFSP</b>		
No	1	1.11
Yes	89	98.89
<b>Total</b>	<b>90</b>	<b>100.00</b>

The results in Table 4 show a mean distance to vine source as 23.74km. The high value of the standard error showed that there are sources that are farther away. The respondents were nonetheless eager to source for OFSP no matter the distance due to the willingness of the buyers to pay for OFSP. More than half of the sources were between 1 - 10km.

**Table 4: Distribution of the Respondents by Farm Distance to OFSP Vine Sources**

<b>Farm Distance from OFSP Vine Source (Km)</b>	<b>Frequency</b>	<b>Percentage</b>
1 – 10	49	54.44
11 – 20	29	32.23
> 20	12	13.33
<b>Total</b>	<b>90</b>	<b>100.00</b>

**Mean = 23.74 (56.21779)**

The distribution of the respondents by the land size used in cultivating OFSP and the yield of OFSP from this land by the respondents is presented in Table 5.

**Table 5: Distribution of the Respondents by Land size, OFSP Yield and Income generated**

	<b>Frequency</b>	<b>Percentage</b>
<b>Land Size Utilized for OFSP (ha)</b>		
1 - 5	49	54.44
6 – 10	30	33.33
> 10	11	12.22
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Mean = 5.69 (3.74959)</b>		
<b>Yield of OFSP (Bag/Kg)</b>		
1 - 50	36	40.00
51 – 100	16	17.78
> 100	38	42.22
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Mean = 116.30 (96.80137)</b>		
<b>Revenue from OFSP Sale</b>		
1 - 100,000	35	39.33
100,001 – 200,000	32	35.95
> 200,000	22	24.72
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Mean = 165361.80 (145221.40)</b>		

The mean land utilized for OFSP cultivation is 5.69ha. The standard deviation showed that some cropped as low as 1.94ha and as high as 9.44ha. This reveals that there are those who produce in subsistence and commercial level. This is in line with the outcome of the yield of OFSP. The mean yield of OFSP is 116kg with a standard deviation of 96.80137. In addition, the average income generated from the sale of OFSP is N165361.80 while the disparity in the amount generated is N145221.40 which affirms the commercial nature of some of the respondents.

### Constraints associated with OFSP Production

The most significant constraint faced by the respondents is inadequate capital (82.22%). High cost of labour (36.67%) and High cost of vine (33.33%) was considered to be one of the important constraints bedeviling the production of OFSP. Access to clean vines (28.89%) was considered by the respondents as moderately important. Distance to sources of vines was recorded as the least important by 28.89% of the respondents as revealed by the distance that they travel to find the OFSP vines. This could be as a result of those willing to pay for the OFSP instead of other varieties of sweet potato. 15.56% of the respondents see high cost of labour as the most important constraint.

**Table 6: Distribution of the Respondents by Constraints**

Constraints	Most Important	Important	Moderately Important	Least Important
High cost of vines	8(8.89)	30(33.33)	8(8.89)	19(21.11)
Access to clean vines	6(6.67)	7(7.78)	26(28.89)	7(7.78)
Distance to sources of vines	9(10.0)	7(7.78)	3(3.33)	26(28.89)
High cost of labour	14(15.56)	33(36.67)	3(3.33)	6(6.67)
Inadequacy of capital	74(82.22)	9(10.0)	2(2.22)	0(0.00)
Others	1(1.11)	2(2.22)	1(1.11)	4(4.44)

\*percentage in parenthesis

The knowledge and identification of virus disease that attack OFSP is presented in table 7. Most of the respondents (82.22%) have the knowledge of viral disease that attack OFSP while 17.78% posited that they do not have the knowledge of the viral disease. Of those that were aware of the viral disease, 92.22% of them could recognize the symptoms of the viral disease and would be able to act on ways to eliminate this diseases or even find ways of preventing its occurrence.

**Table 7: Distribution of the Respondents by knowledge of OFSP Virus Disease**

	Frequency	Percentage
<b>Knowledge of SweetPotato Virus Disease</b>		
No	16	17.78
Yes	74	82.22
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Notification of Potato Virus Disease</b>		
No	7	7.78
Yes	83	92.22
<b>Total</b>	<b>90</b>	<b>100.00</b>

The number of extension visitation as represented in Table 8 is not encouraging. Most of the respondents hardly had more than 1 (one) visitation as a high percentage recorded no visitation according to their responses especially on OFSP. In fact, the mean number of visitation is less than 1 (0.56). This is not encouraging for the adoption of this type of technology.

**Table 8: Distribution of the Respondents by Extension Officer visitation regarding OFSP**

Extension Officer visitation regarding OFSP	Frequency	Percentage
0 – 5	76	84.47
6 – 10	15	5.56
> 10	9	10.00
<b>Total</b>	<b>90</b>	<b>100.00</b>

Table 9 revealed that more than half (57.78%) of the respondents have access to good quality OFSP while 42.22% are of the view that they lack access to good quality OFSP vines. Those who lack access to good quality OFSP are high and this could affect the overall performance of the farmers.

**Table 9: Distribution of the Respondents by Access to Good Quality OFSP**

Access to Good Quality OFSP	Frequency	Percentage
No	38	42.22
Yes	52	57.78
<b>Total</b>	<b>90</b>	<b>100.00</b>

According to Table 10, mother's delight is the most sought. Almost all the respondents (93.33%) favours mother's delight. This may be majorly due to the knowledge of the nutritional value of the it.

**Table 10: Distribution of the Respondents by Most favourite OFSP Varieties**

Most Favourite OFSP Varieties	Frequency	Percentage
Mother's Delight	84	93.33
King J	6	6.67
<b>Total</b>	<b>90</b>	<b>100.00</b>

Results in Table 11 showed that about 92.22% of the respondents prefer Mother's delight because of its maturity period and beta carotene content. 91.11%, 87.78% and 67.78% also prefer to pay for Mother's delight because of its high yield, overall acceptability and it figur respectively. A sizeable number (12.22%) also reported the preference for its dry matter content.

**Table 11: Distribution of the Respondents by reasons for preference of OFSP varieties**

Reason for Preference of OFSP Varieties	Mother's Delight	King J
Figure	61(67.78)	5(5.6)
Disease Free	21(23.33)	2(2.22)
Maturity Period	83(92.22)	6(6.67)
Beta Carotene	83(92.22)	6(6.67)
Yield	82(91.11)	6(6.67)
Dry Matter Content	11(12.22)	2(2.22)
Overall Acceptability	79(87.78)	6(6.67)



### Willingness to Pay

As reported in Table 12, almost all the respondents (97.78%) are willing to pay for OFSP varieties of sweet potato. The average amount they are willing to pay is N311.11 and the standard deviation of the amount is N54.45221. Also 37.78% and 34.44% of the respondents were willing to buy between 0-20kg and 21-40kg of OFSP respectively.

**Table 12: Distribution of the Respondents by Willingness to pay for OFSP**

	Frequency	Percentage
<b>Willingness to Pay</b>		
No	2	2.22
Yes	88	97.78
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Amount willing to Pay</b>		
≤ 200	3	3.33
250 – 500	87	96.67
<b>Total</b>	<b>90</b>	<b>100.00</b>
<b>Mean = 311.11 (54.45221)</b>		
<b>Quantity Willing to Buy (Kg)</b>		
0 – 20	34	37.78
21 – 40	31	34.44
> 40	25	27.78
<b>Total</b>	<b>90</b>	<b>100.00</b>

The reasons given by the respondents who are unwilling to pay for OFSP are presented in table 13 below. 51.11%, 41.11% and 38.89% posited that the lack of market to sell OFSP, presence of other sweet potato varieties around, and lack of the financial capability respectively as the reasons adduced to their unwillingness to pay for OFSP. 62.22%, 61.11% and 58.89% opined that their lack of willing to pay for OFSP were not due to not being interested in OFSP, not being able to afford for its payment and the presence of other sweet potatoes around. This means that more people are willing to pay for OFSP as a large number rejected the reasons listed below for their unwillingness to pay.

**Table 13: Distribution of the Respondents by Reasons for unwillingness to pay for OFSP**

Reason for unwillingness to Pay	Yes	No
Household cannot afford to pay	35 (38.89)	55(61.11)
No market to sell	46(51.11)	44(48.89)
Not interested in OFSP	34(37.78)	56(62.22)
Many other sweetpotato around	37(41.11)	53(58.89)

Table 14 revealed that 95.56%, 94.44% and 90.00% were willing to pay for OFSP because of its health benefit, profitability and early maturing period respectively.

**Table 14: Distribution of the Respondents by Reasons for Willingness to pay for OFSP**

Reason for willingness to Pay	Yes	No
Health Benefit	86 (95.56)	4(4.44)
Early Maturity	81(90.00)	9(10.00)
Profitability	85(94.44)	5(5.56)

In Table 15, the awareness of different technology showed that 98.89% and 94.44% of the respondents were aware of clean planting materials, high yielding varieties, early maturing varieties and disease resistant varieties respectively. This showed that almost all of them were aware of these new technologies which are good for the commercialization of OFSP and the willingness to buy this variety.

**Table 15: Distribution of the Respondents by awareness of New Farming Technology**

Awareness of New Farming Technology	Yes	No
Clean planting materials	89(98.89)	1(1.11)
Disease Resistant Varieties	85(94.44)	5(5.56)
High Yielding Varieties	89(98.89)	1(1.11)
Early Maturing Varieties	89(98.89)	1(1.11)

**Table 16: Distribution of the Respondents by Perception of the new technology**

Perception about New Technology	Yes	No
Like them very much	6(6.67)	84(93.33)
Like them	89(98.89)	1(1.11)
Do not like them	90(100.00)	0(0.00)
Have no ideas	88(97.78)	2(2.22)

**Factors affecting Farmer’s Willingness to Pay for quality Orange Fleshed Sweet Potato OFSP Vines**

The econometric analysis was done to determine the socioeconomic factors that influence farmers’ willingness to pay for virus-free sweet potato vines. The Log likelihood is 313.248 and Chi square is significant at  $P < 0.01$ . The Tobit model in Table 17 indicates that the quantity of bundles willing to buy positively and significantly ( $P < 0.01$ ) influenced farmers’ willingness to pay for OFSP. It showed that there will be 12.8% increase on the quantity of OFSP as the bundles of vines farmers are willing to buy increases. Sex is also positively significant at 5%. This means as the number of male farmers’ increase, the number of OFSP vines they are willing to obtain also improves. Also, age was negatively and significantly ( $P < 0.1$ ) affect the farmers willingness to pay for OFSP. This means that as the age of the farmers’ increase, the farmers’ willingness to pay for OFSP vines reduced by 59.4%. This may be due to lack of the strength to engage in farming activities. Off-farm income also positively influences farmers’ willingness to pay for OFSP vines. The positive significant ( $P < 0.05$ ) relationship is in accordance to the *a priori* expectation as a unit increase in farmers’ off-farm income lead to a marginal increase in their willingness to pay for OFSP vines because they will have more money to buy it.

Distance of farm to OFSP vine source, land size of OFSP cultivated and the awareness of disease resistant varieties of OFSP vines all have negative significance of  $P < 0.05$ . Land size and awareness of disease resistant varieties are not in accordance with the expected sign because this should rather positively affect them. The yield of OFSP and the total revenue generated have positive significance at  $P < 0.05$  and  $P < 0.01$  respectively. These two go hand in hand because as the farmers procure more OFSP vines, the yield will increase which will inevitably lead to increase in revenue generated by the farmers.

The analysis of the factors affecting farmers’ willingness to pay for OFSP vines as showed revealed that these socioeconomic factors actually affect the willingness of the respondents to pay for OFSP vines.

**Table 17: Tobit Regression Estimates of Factors affecting Farmer's Willingness to Pay for quality orange fleshed sweetpotato OFSP Vines**

Variables	Coefficient	Standard Error	t-value
Constant	312.8773	24.05404	13.01
Quantity of Bundles	0.12827	0.020705	6.19***
Age	-0.59381	0.270866	-2.19*
Sex	19.60404	7.19667	2.72**
Educational Level	0.86494	3.57753	0.24
Household size	-0.084763	0.571285	-0.15
Off-farm Income	0.00020	0.0000798	2.56**
Member of Assoc.	12.49012	8.637651	1.45
Distance of OFSP	-0.16921	0.057321	-2.95**
Land size cultivated	-2.39335	0.984437	-2.43**
Yield of OFSP	0.097206	0.042934	2.26*
Total revenue of OFSP	0.000143	0.000025	5.60***
Disease resistant Var	-42.78038	13.71256	-3.12**

*Sources: Computed from survey data, 2016*

\*\*\* =  $P < 0.01$ ; \* = Significant at 1%, \*\* = Significant at 5%,

Prob > Chi2: 0.0000; Pseudo R2 = 0.1590

Log likelihood: -313.248

Observation Summary: 5 left-censored observations at Willpay  $\leq 250$ ; 67 uncensored

Observation; 3 right-censored observations at willpay  $\geq 500$

## Conclusion

It was revealed that most of the OFSP farmers were male and young, most of them have a form of education or another and they belong to an association. Many studies generally show that younger farmers adopt new technologies more readily than older farmers which showed in the adoption of good quality OFSP vine and the desire for Mother's delight. They lack access to credit and seldom see extension agents most especially on OFSP which could affect their yield. Almost all of them are willing to pay for OFSP due to its health benefit, early maturity and its profitability. It is recommended that more research should be carried out and more awareness should be made to improve on OFSP production especially among women and youth. Fund should be made available for the farmers because this is the major constraint hindering them from willingly accepting to pay a higher amount for OFSP vines. OFSP vines sources should be moved closer to farm areas.

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