UNDER PEER REVIEW

# Awareness and Utilization of Improved Plantain Production Technologies in Combating Food Security among Plantain Household Farmers in Abia State.


## Abstract

The study assessed the awareness and utilization of improved plantain production technologies in combating food security among plantain household farmers in Abia State. Random sampling technique was used to select 60 respondents. Structure questionnaire was used for data collection. Data collected were analyzed with descriptive statistics such as frequency, percentages and means. Results of the study showed that a good proportion (56.7%) of the respondents had their plantain located in the field mainly for commercial purpose (78.3%), got their planting materials from proceedings of previous owned farm (58.3%), had 100 – 200 number of stands, planted and made up to ₦80,000.00 – ₦110,000.00 and above per annum. The major technologies aware and utilized by the respondents were weeding (application of herbicides – 98.3%), Pruning – (66.7%) and Desuckering, (2-3 stands) (66.7%) respectively while others were in negligence. The respondents' sources of information were mainly fellow farmers (95%) and friends/relatives (83.3%). However, the respondents' level of awareness on improved technologies was low (44.2%). Hence the study recommended that more awareness should be created by the extension agents with demonstration and fellow-up for proper utilization of the technologies.


**Keywords: Awareness, utilization, improved plantain, technologies, Plantain Farmer**

UNDER PEER REVIEW

## Introduction

Plantain (Musa paradisiaca.L) is undoubtedly one of the old cultivated fruits that has occupied a strategic position in agricultural production across the globe. Fakayode *et al* (2011) saw plantain as a crop that could bridge the gap between demand and supply of the basic carbohydrate staples. About 70 million people in the African sub-region are estimated to derive more than one quarter of their food energy requirement from plantain (IITA, 2014). In Nigeria also plantain is known as one of the major staple food as the country ranked the fifth highest producer of the crop (Fortaleza 2011, FAO, 2004). Besides being the staple for many people, plantain delicacies are favoured snack for people even in other ecologies (IITA, 2014). It also contributes to food security, employment and diversification of income both in rural and urban areas, thus help in poverty alleviation (Dimelu, 2015; CTA, 2005). For instance, plantain chips is waxing as a growing industry with high demand being experienced (Olumba and Rahji, 2014).

Despite its prominence, Nigeria does not feature among plantain exporting nations because it produces more for local consumption than for export (Fortaleza, 2012). In addition, the small-scale farmers depend more on traditional technologies such as local cultivars, poor farming techniques for reproduction which is characterized by poor yield and inefficiency (IITA, 2009). Thus, the need for transformation of traditional farming system for improved practices which leads to increased food production. Similarly, it has been evident that the issue of low level of uptake of technologies have resulted largely for low level and poor performance in agricultural sectors (Ojeleye, 2009; Oyewole and Ojeleye, 2015).

However, one way of improving agricultural productivity is through creation of awareness of improved technologies to farmers as well as encourage in the utilization of the technologies. Hence increasing the productivity of small-holder agriculture and improve wellbeing for millions of the poor households (Doss 2006, Ouma *et al.,* 2006). Based on the above issue

UNDER PEER REVIEW

about 14 different plantain technologies have been developed and released by International Institute for Tropical Agriculture (IITA), such as: weeding, propping, pruning, fertilizer/manure application, hybrid varieties, mulching, hot water treatment, agro-chemical application, sucker multiplication, sucker cleaning, planting space, desuckering, planting time and debudding (Akintade *et al* 2014). Inspite of it, some of these farmers lack relevant information on some of these technologies (Olumba 2014). Consequently, the utilization level of the technologies are low.

Abia State especially Ohafia zone is one of the zones where plantain production is the primary commodity for investment in Nigeria. Yet the utilization of the improved plantain technologies is still questionable because in the absence of awareness, utilization will be ignored or low. On the other hand, farmers are always ready to utilize or adopt any technology that will increase their income from the farm (IITA, 2009). Therefore the pertinent questions however are:-

What are the plantain production characteristics of the farm households, what types of improved plantain production technologies are disseminated to farmers, what are the sources of farmers' information and what is the level of awareness of improved plantain production technologies?

Therefore, the study was designed to assess the awareness and utilization of improved plantain production technologies by farmers in combating food security in Abia State, Nigeria. Specifically the study sought to:

- describe the plantain production characteristics of the farm households in the study area,
- ascertain the type of improved plantain production technologies,
- identify the source of information of the improved plantain technologies,

UNDER PEER REVIEW

- determine the level of awareness of the improved technologies by the farmers.

**Methodology**

The study was conducted in Abia State, Nigeria specifically Ohafia Agricultural Zone. Ohafia Agricultural zone is one of the three agricultural zones in Abia State. It is made up of five (5) Local Government Areas namely: Arochukwu, Bende, Isuikwuato, Uzuakoli, and Umunneochi. The zone was chosen because of the prominence in plantain cultivation. Ohafia agricultural zone has five blocks namely Arochukwu, Bende, Isuikwuato, Uzuakoli, and Umunneochi. All the blocks were purposively selected while lists of plantain farmers were collected from ADP extension agents supervising each of the blocks. In each list (block) a minimum of 20 plantain farmers were identified and 12 farmers were randomly selected; giving a total of 60 respondents for the study. Primary data were collected through the use of structured questionnaire. Data collected were analyzed with a simple descriptive statistics such as frequency distribution, percentages and means.

Objectives 1, 2, 3 were determined with frequency and percentage while objective 4 was determined with mean percentage. To determine objective 4 – (level of awareness of improved plantain production technologies), a list containing twelve (12) technologies of plantain was presented to the respondents in which they were asked to state whether they are aware of the technology or not.

The percentage score for each technology were added together and divided by the number of technology which gives the mean percentage. However, 50% and above was used to determine high of awareness, order wise low awareness.

**Results and Discussions.**

**Production characteristics of the respondents**

UNDER PEER REVIEW

Table 1 reveals the production characteristics of the respondents. The result shows that a good proportion of the respondents (56.7%) had their plantain location on the field as against (43.3%) that planted at the backyard and along the road. This is in contrast with Bayeri *et al.,* (2004) who reported that in the South Eastern part of Nigeria, plantain is predominantly planted at the backyard/compound. Planting in the field is an evident of large – scale production that leads to commercialization and aids in combating food insecurity. The result also shows that (59%)of the respondents sourced for their planting materials from the proceeding of previous year owned farm and about (41%) got from friends and neighbours, research institutes and ADP/Ministry of agriculture. By implication there may be low genetic transfer in the crop which could be caused as a result of increase of diseases and pests infestation from existing plants reproduced from previous cuttings. There may be also lack of necessary information from extension and research Institutes which could have been avoided by the use of improved planting materials.

In terms of number of stands planted (71.7%) of the respondents had 101 – 200 stands of plantain in their farms and a lesser proportion (28.3%) had 1 – 100 respectively. This could be attributed to a greater proportion (78.3%) of the households that engaged in plantain production basically for commercial purpose. Furthermore, (83.4%) of the respondents generate annual income of ₦80,000. 00 – ₦110,000.00 and above. However, the income informs production interest of more respondents

.

UNDER PEER REVIEW

**Table 1. Distribution of Production Characteristics of the Respondents.**

| **Production characteristics** | **Freq = n = 60** | **Percentage** |
|---|---|---|
| **Location** | | |
| Field | 34 | 56.7 |
| Backyard | 25 | 41.7 |
| Along road side | 1 | 1.6 |
| **Source of planting materials** | | |
| Proceedings from previous owned farm | 35 | 58.3 |
| Friends/Neighbours | 15 | 25.0 |
| Research Institutes | 3 | 5.0 |
| ADPs/Ministry of Agriculture | 7 | 11.7 |
| **Number of stands planted** | | |
| 1 – 50 | 7 | 11.6 |
| 51 – 100 | 10 | 16.7 |
| 101 – 150 | 30 | 50.0 |
| 151 – 200 | 13 | 21.7 |
| **Reasons for Production** | | |
| Commercial | 47 | 78.3 |
| Personal | 13 | 21.7 |
| **Income realized per year** | | |
| 20,000 – 49,000 | 5 | 8.3 |
| 50,000 – 79,000 | 5 | 8.3 |
| 80,000 – 109,000 | 10 | 16.7 |
| 110,000 and above | 40 | 66.7 |

UNDER PEER REVIEW

**Source: Field Survey, 2017**

**Types of plantain production technologies disseminated**

The result in Table 2 reveals that there were about 12 improved plantain technologies disseminated by the respondents. Thus, the philosophy of improved technologies is to increase productivity, reduce infestation of disease and pests as well as decrease food insecurity. In other words, the result reveals that among the plantain technologies disseminated, weeding (application of herbicide – 98.3%), planting space 3/2 metre (83.3%) mulching – (71.7%), pruning – (66.7%). Desuckering (2 – 3 stands – 66.7%) highly utilized while (48.3%) and (43.3%) practiced mulching and planting spaces respectively. Other improved technologies were insignificantly utilized, showing that a considerable percentage of the respondents however did not either understand the technologies or lack knowledge of the importance. It also implies that neither the extension workers did not fully explain nor demonstrate the application of the technologies nor farmers lack interest on the technologies. Thus, the study suggests for more creation of awareness of the technologies for farmers to understand the application and put them into practical use for increase production.

**Table 2: Distribution of Improved Plantain Technologies disseminated/practiced by the Respondents**

| Technologies disseminated/Practiced | Freq = n = 60 | Percentage |
|---|---|---|
| Weeding (application of herbicides) | 59 | 98.3 |
| Propping | 11 | 18.3 |
| Pruning | 40 | 66.7 |
| Fertilizer application | 12 | 70.0 |
| Nysrid | 11 | 18.3 |
| Mulching | 43 | 71.7 |

UNDER PEER REVIEW

| | | |
|---|---|---|
| Hot water treatment | 5 | 8.3 |
| Agro chemical application | 8 | 13.3 |
| Sicker cleaning | 4 | 6.7 |
| Sucker multiplication (split. Tech.) | 1 | 1.7 |
| Planting space (3/2 metre) | 50 | 83.3 |
| Desuckering (2 – 3 stands) | 40 | 66.7 |
| Pest/Disease control | 29 | 48.3 |

**Source: Field survey 2017. Multiple responses recorded.**

**Sources of Information of Plantain Technologies.**

Table 3 shows that majority (95%) of the farmers got the information from fellow farmers and friends/relatives (83.3%). It is an indication that information flow faster and easier among farmers due to close contact and sharing of views. This result agrees with the work of Nwachukwu (2014) that fellow farmers' aid in the dissemination of innovation among local farmers. Information from ADP (8.3%) and Ministry of Agriculture were the least (8.3%) respectively. It shows poor extension services. Therefore, the ADPs should stand and take-up their responsibilities in information dissemination in order to encourage productivity among farmers.

**Table 3: Distribution of the respondents based on sources of Information on Improved Plantain Technology**

| **Sources of Information** | **Freq = n = 60** | **Percentage** |
|---|---|---|
| ADP – Extension Agents | 5 | 8.3 |
| Friends/Relatives | 50 | 83.3 |
| Fellow Farmers | 57 | 95.0 |
| Mass Media | 8 | 13.3 |

UNDER PEER REVIEW

| | | |
|---|---|---|
| Ministry of Agriculture | 5 | 8.3 |

**Source: Field Survey 2017. Multiple Responses recorded.**

**Level of Awareness of Improved technologies by farmers.**

The result in Table 4 shows that majority of the respondents were aware of weeding (application of herbicides – 100%). Desuckering – 2 – 3 stand (83.3%), planting space (3/2 metres – 66.7%) and pruning – (65%) respectively. However, the respondents indicated not aware of the other technologies and more especially Hot water treatment (100%); Sucker multiplication (Split technology – (100%), Agro-Chem. (83.3%) and Propping (66.7%). Consequently, resulting to low level of utilization of technologies.

This confirms the work of Olumba and Rahji (2014) that most farmers seem to lack information on hot water treatment and chemical application. Thus extension agents should put more efforts in creating awareness through demonstration of the technologies for better understanding and proper utilization of all the technologies in other to promote bomber harvest.

**Table 4: Distribution of the respondents based on level of awareness of Improved Plantain Technologies**

| Technologies | Aware | | Not Aware | |
|---|---|---|---|---|
| | Freq | Percentage | Freq | Percentage |
| Weeding (application of herbicide) | 60 | 100 | - | - |
| Propping | 20 | 33.3 | 40 | 66.7 |
| Pruning | 39 | 65 | 21 | 35.0 |
| Fertilizer application | 20 | 33.3 | 40 | 66.7 |
| Nysrid | 20 | 33.3 | 45 | 66.7 |

UNDER PEER REVIEW

| | | | | |
|---|---|---|---|---|
| Mulching | 39 | 65 | 21 | 35.0 |
| Hot water treatment | - | - | 60 | 100 |
| Agrochem application | 10 | 16.7 | 50 | 83.3 |
| Sucker cleaning | 20 | 33.3 | 40 | 66.7 |
| Sucker multiplication (Split technology) | - | - | 60 | 100 |
| Planting space (3/2 metres) | 40 | 66.7 | 20 | 33.3 |
| Desuckering (2 – 3 Stands) | 50 | 83.3 | 10 | 16.7 |
| Mean Percentage | | 44.2 | | 55.8 |

**Source: field survey 2017.**

## Conclusion

The level of awareness and utilization of Improved plantain technologies among farm households was low as the information of the technologies were mainly got from fellow farmers, relatives and friends. However, much impact was not made by the extension agents in the dissemination of the technologies.

Therefore, the study recommends that the ADP should build up a requite knowledge and skills for farmers on the improved technologies. This could be achieved through proper demonstration and training of these farmers in the utilization of the improved plantain techonlogies, thus combating food insecurity.

## References

Akintade, T.F. Okunlola, J.O, Akinbani A.S. (2016). Factors Influencing Adoption of Plantain Improved Technologiies among small holder farmers in Edo State, Nigeria. International Journal of Bio, Agric and Health care 6(6).

UNDER PEER REVIEW

Baiyeri K.P, Tenkouno A; Mba, B.N and Mbagwu J.S.K (2004). Phonological and Yield Evaluation of Musa Genotypes under Alley and sole Cropping systems in Southern Nigeria. Tropical and Subtropical Agroecosytems 4(3) p 137 – 144.

CTA (2005). The Tropical Agriculturist Plantain Banana. Macmillan Oxford Ox 43pp

Dimelu M.U. (2015). Involvement of farm households in Banana and Plantain production in Aguata Agricultural Zone of Anambra State. Journal of Agricultural Extension. A publication of AESON ISSN 1119-944x. vol.19 (1) June. P 107 – 110.

Doss C.R. (2006): Understanding farm level technology adoption lessons learnt from CIMMYTs micro-survey in Eastern Africa. CIMMYT Economic working, Mexico, D.F. p 7 – 30.

Fakayode B.S, Rahji. M.A.Y. Ayinde O, Nnom G.O. (2011). An economic assessment of plantains production in Rivers State, Nigeria. International Journal of Agriculture, Economics and Rural Development 4(2).

Food and Agriculture Organization AGROSTAT Database (2004). Food and Agriculture (IITA – 2009). New Plantain and banana cultivars improve crops yields in Sub-Sahara Africa. http://old.iita.org

Fortaleza C. (2017). The Ultimate wealth guide to making millions of naira yearly, with plantain farming in Nigeria http://plantainfarming.blogspot.com

IITA (2014). International Institute of Tropical Agriculture. Annual report. www.iita.org

UNDER PEER REVIEW

Ojeleye O.A. (2009). Economic evaluation of usage of farmers' productivity enhancing practices in the Nigerian Northern Savannah. An unpublished M.Sc. Thesis submitted to the Department of Agricultural Economics and Rural Sociology, ABU, Zaria.

Olumba C.C., Rahji M.A.Y (2014). An analysis of the determinants of the adoption of Improved Plantain Technologies in Anambra State, Nigeria.

Ouma, J.O; De Groot H, Owuor G. (2006): Determination of Improved maize seed and fertilizer use in Kenya: Policy implication presented at the International Association of Agricultural Economics Conference, Gold Coast Australia August. p 12 – 18.

Oyewole, S.O.and Ojeleye O.A. (2015). Factors influencing the use of improved farm practices among small-scale farmers in Kano State of Nigeria. Net Journal of Agric. Science 3(1):1-4