INTERNATIONAL JOURNAL OF CONTEMPORARY AFRICA RESEARCH NETWORK
Publication of Contemporary Africa Research Network (CARN)
Volume 1 (1), 2024
Available online: https://journals.iapaar.com/index.php/ijcarn/issue
DOI: 10.5281/zenodo.10575368

MID-RAIN PLANTAIN FARMING SKILL NEEDS REQUIRED BY GRADUATES OF AGRICULTURE EDUCATION FOR SUSTAINABLE PRODUCTION IN AKWA IBOM STATE, NIGERIA

[1]Fidela Enoidem UDOH

[2]Inibehe JOB

[3]Aniebiet Ezekiel NKANTA
[1,2,3]Department of Agricultural Education
University of Uyo, Nigeria
Email: fidelaudoh@uniuyo.edu.ng

Abstract

The study determined mid-rain plantain farming skill needs by graduates of agriculture education for sustainable production in Akwa Ibom State, Nigeria. Three research questions and one hypothesis guided the study. Mean with standard deviation was used to answer the research questions, while t-test was used in testing the hypothesis at .05 level of significance. Descriptive survey design was used for the study. The study was carried out among agriculture education lecturers and registered plantain farmers in Akwa Ibom State, Nigeria. The population comprised of two hundred and forty (240) registered plantain farmers and one hundred and twenty (120) Agriculture Education lecturers in three (3) tertiary institutions as follows; 50 from University of Uyo, 40 from Akwa Ibom State University, Ikot Akpaden, and 30 from College of Education, Afaha Nsit. Simple random sampling technique was used to obtain fifty percent (50%) of the population. A sample of 180 respondents was used for the study. A researcher made instrument title: 'Min-rain plantain farming skills need for sustainable production Questionnaire (MPFSNSP)'was used for data collection. The instrument was face validated by experts. Reliability co-efficient of .86 was obtained using Cronbach alpha reliability test. The findings of the study revealed that agriculture education graduates need skills; pre-planting, planting and post-planting cultural practices in mid-rain plantain farming technology for sustainable plantain production in Akwa Ibom State. It was recommended among others that government of Akwa Ibom State in collaboration with ministry of agriculture should organize workshop and field demonstration on mid-rain plantain farming cultural practice for the graduates for agriculture education for sustainable plantain production in Nigeria.

Keywords: Mid-Rain, Plantain, cultural practices, sustainable, production.

Introduction

Plantain (Musa-Paradisiace) is an herbaceous perennial plant of genus Musa. It belongs to the order of the "Zingberals" and family of Muscaeade. It is a treelike perennial plant about 2-9 meters tall. Plantain is said to have originated from south East Asia. Plantain is grown both in the tropics and sub-tropics region of the world; India, Egypt, Tropical America, Africa, West Indices Marriot *et al.,* (2003). Plantain production in Nigeria, a country in West Africa is concentrated in the southern states of; Cross River, Edo, Akwa Ibom, Delta, Rivers, Osun, Oyo,

Ogun and Lagos. These regions are naturally endowed with adequate annual rainfall, being a major climatic condition that supports plantain production Ayanwale *et al*., (2016)

Traditionally the cultivation of plantain in Akwa Ibom State was limited to the onset of rainfall, the "growing season". Ibirogba *et al.,* (2018) observed that growing season, is the period of the year when rainfall distribution characteristics are suitable for crop germination, establishment, and full development and yield. Amosun (2018) observed that plantain grows, matures and harvest within the 9-12 calendar months, depending on the variety and agronomy practices used during the growing period. In Akwa Ibom State, the growing season usually comes between the calendar months of March-May. After night months comes the bomber harvest from the month of October through December. During this period plantain is found flooding the market until a gradual and complete absent of rainfall, a period of the year known as dry season. Dry season is characterized by no rainfall, hot sun, drought and huge dust in the air. The dry season environmental conditions usually works against the growth, development, fruiting and yield of plantain. In fact, at the peak of dry season, in the months January, February and early March plantain are usually found stunted, dried, and withered and no yield. Plantain will continue to suffer the unfavourable climatic torture until the return of rain fall, the growing season. The after effects of the dry season is usually plantain scarcity, and the few available is usually expensive. While the farmers would suffer huge lost by massive withering and destruction of plantain and farms. The dry season environmental hazard do brings about food scarcity, hunger, leading to untold hardship, poverty, and hunger and unsustainable in plantain production.

Kelvin (2020) observed that the quantity of plantain produced by the traditional technology even with total dependency on rainfall was sustainable within families, communities and local trading. But as the population gradually increases, which seem not to have been noticed, there was a corresponding need to step up production. Also the growing season, plantain production could no longer sustain the demand of plantain home consumption and industrial raw material. As observed by Edeghon *et al.,* (2011) that the technological advancement, of the utilization of plantain beyond local consumption, to industrial raw materials, in the confectionaries, bakeries, beverages and snacks industries places more demands on plantain production. The realization of the multiple uses of plantain beyond home consumption to industrial raw materials has necessitated this study. To bring about sustainable plantain production through mid-rain farming technology in Akwa Ibom State, Nigeria.

Mid-Rain Plantain Farming Technology and sustainable production among graduates of agriculture.

Mid-rain plantain farming technology is a farming system of cultivation of plantain beyond the growing season. It is an improved farming technology, where plantain is planted at the peak of the raining season, against the traditional technology of planting at the beginning of rain, the growing season. The International Institutes of Tropical Agriculture (2014) observed that plantain can be planted throughout the rainy season, that in the southern part of Nigeria were plantain thrived, that the rainy season spread from March to October .Ayanwale, et al (2016) further observed that Akwa Ibom State is located in the Southern region of Nigeria endowed with moisture-rich tropical climates that fully support plantain farming. This implies that in Akwa Ibom State, plantain can be cultivated for eight (8) months within the twelve (12)

calendar months of a year. Ekunwe and Ajayi (2010) opined that plantain farming is undoubtedly one of the most profitable agricultural business ventures that can be described as a true investment. Despite the geographical and environmental support of plantain farming in Akwa Ibom State, it is worrisome why most graduates of agriculture education are unemployed. Onwudiwe, Udoh and Essien (2016) observed that graduates unemployment is attributed to the fact that learner's education and skill are not relevant in the modern and available employment opportunities. Therefore scientific and improve technology in agricultural production and services becomes necessary. Mid-rain plantain farming technology is a modern day employment opportunities in the farming industry.

Mid-rain innovation technology is developed towards providing sustainable production and employment opportunities, generating income, providing food, producing raw materials for plantain agro-allied-industries and promotes sustainable plantain production. Above all mid-rain plantain farming complement and bridge the gap of plantain scarcity after the bomber harvest of the traditional growing season plantain farming technology. Mid-rain plantain farming, by its potential becomes needful that the skills are acquired by the graduates of agriculture education for sustainable productivity and employment.

The technological skills requirement in mid-rain plantain farming centers on cultural practices. Cultural practice according to Ayanwale et al (2016) involves all the activities carry out on farm; before, during and after planting. Technically the practices are grouped as pre-planting, planting and post-planting cultural practices. The pre-planting cultural practices are series of activities performed on field before sucker placement. The planting cultural practices are the activities during sucker placement. While the post-planting cultural practices are the series of routine protective, control and maintenance measures carried out on the farm and the crops throughout the cultivation period, the fruiting and harvesting (Ayanwale, 2016).The study sought to identify the pre-planting, planting, and post-planting cultural practices in mid-rain plantain farming technology required by graduates of agriculture education for sustainable production in Akwa Ibom State Nigeria.

Purpose of Study

The purpose of the study is to determine the cultural practices in mid-rain plantain farming technology required by graduates of agriculture education for sustainable plantain production in Akwa Ibom State, Nigeria. Specifically the study sought to determine:

1. The pre-planting cultural practices required by graduates of agriculture education in mid-rain plantain farming technology for sustainable production in Akwa Ibom State, Nigeria.
2. The planting cultural practices required by graduates of agriculture education in mid-rain plantain farming technology for sustainable production in Akwa Ibom State, Nigeria.
3. The post-planting cultural practices required by graduates of Agricultural education in mid-rain plantain farming technology for sustainable production in Akwa Ibom State, Nigeria.

Research Questions

1. What are the pre-planting cultural practices required by graduates of agricultural education in mid-rain plantain farming technology for sustainable production in Akwa Ibom State Nigeria?
2. What are the planting cultural practices required by graduates of agriculture education in mid-rain plantain farming technology for sustainable production in Akwa Ibom State Nigeria?
3. What are the post-planting cultural practices required by graduates of agriculture education in mid-rain plantain farming technology for sustainable production in Akwa Ibom State Nigeria?

Research Hypothesis

There is no significance difference in the mean response of agriculture education lecturers and registers plantain farmers in the post-cultural practices required by graduates of agriculture education for sustainable plantain production.

Methodology

The study employed survey design. Survey research design was suitable for the study because it involves the collection of detailed description of public opinion on existing phenomena with the intent to justify current conditions and practices to make better plans for improving the phenomena. The study was conducted in Akwa Ibom State, Nigeria. Nigeria is a country in Africa on the gulf of Guinea. It has many natural landmarks and wildlife reserves. Akwa Ibom State is located in the costal southern part of Nigeria, latitudes 4^0 32N and $5^0$33N $7^0$25'E and $8^0$25'E. The state is located in the south-south and geopolitical zone. It is bordered on the east by Cross River State, on the west by Rivers State and on the north Abia State, and on the south by the Atlantic Ocean.

In Akwa Ibom State, agricultural activities of crop production, livestock, forestry and fishery production are carried out. Akwa Ibom has several institutions of learning including primary, secondary, Colleges of Education, Polytechnic and university etc, the study was conducted in tertiary institution offering agriculture programmes; University of Uyo, Uyo, Colleges of Education, Afaha Nsit, and Akwa Ibom State University, Ikot Akpaden. The population for the study was three hundred and eight (380), comprising of one hundred and twenty (120) agriculture education lecturers and two hundred and forty (240) registered plantain farmers with the state government. Simple random sampling was used to sampled (180) respondents for the study.

A 37 item questionnaire in three clusters was used in data collection. The questionnaire was coded with nominal values designed for each response that was expected from the respondents. The items were on 4 point scale of; very highly required, highly required, required and not required. Data collection for the study was analyzed using mean and standard deviation to answer the research questions. Items with mean rate of 2.5 and above were considered required, while items with less mean value was not required. Hypothesis was tested using t-test statistics @ .05 level of significance. Hypothesis was rejected when the calculated t-value was greater than the t-value, otherwise the hypothesis was retained.

Finding and Results

Research question 1: What are the pre-planting cultural practices in mid-rain plantain farming technology required by graduates of agriculture education for sustainable production in Akwa Ibom State, Nigeria.

Table 1: Mean rating of agriculture education lecturers and registered plantain farmers on the pre-planting cultural practices in mid-rain plantain farming technology required by graduates of agriculture education for sustainable production in Akwa Ibom State, Nigeria.

S/N	Items Statement: A Pre-planting culture practices in mid-rain plantain farming technology	X	SD	Remarks
1.	Field clearing at the beginning of rain March/April	2.7389	1.09015	R
2.	Stumping and removal of unwanted materials	2.7556	1.16572	R
3.	Measuring/marking of planting distance of 3 matters between and within rows	2.7556	1.14639	R
4.	Opening up planting holes/pits of 60cm deep and 60cm wide	2.8889	1.01876	R
5.	Deposition of organic manure; compost, animal droppings, household waste at 15-20cm depth of the planting holes	3.0056	.96008	R
6.	Watering of the deposited organic matter thrice weekly to hasting complete decomposition and release of needed nutrients	2.9056	1.00110	R
7.	Allowing the interval of 3-4 week for complete decomposition of the manure before planting.	3.0444	1.01289	R
8.	Mixing the manure with earth inside the hole to form homogenous soil rich enough to receive plantain sucker	2.3889	.83491	NR

Source: Field Study 2021

The mean reposes on each of the items statement on Table 1 ranged between 2.49 and 3.01. The result revealed that the mean of seven times were above the cut-off point of 2.50 except one. This means that all the respondents except one agrees that the identified pre-cultural practices in mid-rain plantain farming technology are required by graduates for sustainable production in Akwa Ibom State. The standard deviation of the responses which ranged between .83 and 1.17 implied that the respondents were close to one another in their responses that graduates of agriculture education required the pre-planting cultural practices in mid-rain plantain farming technology for sustainable production in Akwa Ibom State.

Research Question 2:

What are the planting cultural practices in mid-rain plantain farming technology required by graduates of agriculture education for sustainable production.

Table 2: Mean rating of Agriculture lecturers and plantain farmers on the planting cultural practices in mid-rain plantain farming technology required by graduates for sustainable plantain production

S/N	Items Statement: B. Mid-rain plantain planting cultural practices	X	SD	Remarks
9.	Investigating, sourcing and identification of improved species of plantain	2.8833	1.00432	R
10.	Selection and purchase of healthy planting material (sucker)	2.933	1.04427	R

11.	Careful handling and transportation of sucker to the farm	2.7889	1.10352	R
12.	Cleaning/trimming of damaged and unwanted parts on the sucker	2.2278	.87056	R
13.	Proper mixing and turning of earth inside pith prepared for planting to break down lumps of earth	2.7722	1.10777	R
14.	Removal of inorganic materials from the pith (nylon, tins, bottle, stone etc)	2.3667	.78320	R
15.	Positioning of the suckers in the centre of the pith at the depth of 60cm	3.1667	.87485	R
16.	Covering the sucker to the depth of 25-45 with earth, allowing 15cm for subsequent manure application and watering	2.7500	1.10294	R
17.	Timely planting/placement of sucker either before or immediately after rainfall	2.8500	1.12600	R
18.	Planting at the peak of the rainy season between the month of June/July	2.8667	1.14042	R
19.	Firmly positioning of the sucker by compressing the earth around the sucker stand	2.800	1.04320	R

Source: Field Study 2021

The data presented in Table 2 shows that the statement items had a mean range of 2.23 to 3.17. The mean of nine (9) items were above the cut-off point 2.50. The result shows that 9 out of 11 respondents agree with the identified planting (sucker placement) cultural practices in mid-rain plantain farming technology are required by graduates for sustainable production. The standard deviation ranged between .78 and 1.14 implied that the respondents were close to one another in their responses that the identified cultural practices are required by graduate of in mid-rain plantain farming technology. The average standard deviation of also showed the closeness of the respondents in their responses.

Research questions 3

What are the post-cultural practices in mid-rain plantain farming technology required by graduates of Agriculture Education for sustainable production in Akwa Ibom State, Nigeria.

Table 3: Mean rating of Agriculture Lecturers and Registered plantain farmers on post-cultural practices in mid-rain plantain farming technology for sustainable production in Akwa Ibom State, Nigeria

S/N	Items Statement: Mid-rain farming post-planting cultural practices	X	SD	Remarks
20.	Planting of cover crops to check excessive water evaporation	2.7778	1.10132	R
21.	Heavy mulching around and within emergent sucker using organic matter	2.8167	1.03284	R
22.	Clearing of vegetation/weeds two-three months after planting	2.4056	.80291	R
23.	Evenly spreading of the cleared vegetation on the farm	3.0222	.94518	R
24.	Stop clearing of vegetation at the onset of dry season October/November	2.4056	.80291	R
25.	No trimming/cutting of plantain leaves both dry and fresh during dry season	2.4444	.85366	NR
26.	Regular watering of the emerged sucker preferable in the evening	2.3333	1.03027	NR

27.	Covering of exposed roots (High Mats) with earth to avoid damage	2.3556	1.01729	NR
28.	Regular addition/application of manure to enhance growth	2.4278	.99176	NR
29.	Constant heavy watering to avoid fallen off	2.5500	1.02087	R
30.	Supporting of plantain stands by staking	2.5611	1.01477	R
31.	Covering of plantain base heavily with earth	2.6444	.98397	R
32.	Allowing one plantain per stand at a time	2.7444	.94024	R
33.	Avoid cutting the leaves either dry or fresh at dry season	2.6000	.98367	R
34.	Covering the base of the plant heavily with organic manure	2.6056	.96588	R
35.	Timely harvesting of mature fruits to avoid damage	2.2722	.79686	NR
36.	Complete cutting down of harvested stand to avoid competing for nutrients	2.4833	1.03824	NR
37.	Chop and arrange the harvested plantain stand around others plantain for support and strength	2.600	1.00753	R

Source: Field Study 2021

The data in Table 3 shows a mean range of 2.27 to 3.02. The mean of nine (9) items had mean score above the cut-off point of 2.50. The result revealed that 9 respondents agreed that post-cultural practices are required in mid-rain plantain farming for sustainable production.

Testing of Hypothesis

Hypothesis 1

Ho_1: There is no significance difference in the mean response of agriculture education lecturers and registered plantain farmers on the post-planting cultural practices in mid-rain plantain farming required by graduates of agriculture education for sustainable plantain production in Akwa Ibom State, Nigeria.

Table 4: t-test statistics analysis on the post-cultural practices in mid-rain plantain farming technology required by graduates for sustainable production

S/N	Items	X1	X2	T	P	Decision
1.	Planting of cover crops to check excessive water evaporation	3.1667	2.583	3.45	.001	S
2.	Heavy mulching around and within emergent sucker using organic matter	3.10	2.675	2.646	.009	S
3.	Clearing of vegetation and weed 2-3 months after planting	2.15	2.53	-3.091	.002	S
4.	Evenly spread of the cleared vegetation of the farm.	3.1667	2.95	1.454	.148	NS
5.	Stop clearing of vegetation at the onset of the dry season	2.15	2.23	-3.091	.002	S
6.	No cutting/trimming of plantain leaves both dry and fresh during dry season	2.20	2.5667	-2.767	.006	S

7.	Regular watering of the planted suckers preferable in the evening	2.55	2.258	2.012	.070	NS
8.	Covering of expose roots (high mats) with edge to avoid damage	2.55	2.258	1.825	.046	S
9.	Regular application of manure to enhance growth	2.53	2.375	1.010	.314	NS
10.	Constant heavy watering to avoid withering.	2.68	2.48	1.241	.216	NS
11.	Supporting of plantain stand by staking	2.7167	2.48	1.459	.146	NS
12.	Covering of plantain base heavily with earth	2.70	2.6167	.535	.594	NS
13.	Allowing one plantain per stand at a time	2.73	2.75	-.112	.911	NS
14.	Avoiding cutting/removing of the leaves either dry or fresh at dry season	2.73	2.53	1.288	.199	NS
15.	Covering of the base of the plant heavily with organic manure	2.70	2.558	.927	.355	NS
16.	Timely harvesting of fruit	2.1167	2.35	-1.865	.064	NS
17.	Complete cutting down of the harvested stem to avoid competing for nutrient	2.63	2.408	1.374	.171	NS
18.	Chopped and arrange the harvested plantain stand around others yet to be harvested for support and strength to withstand the harsh season.	2.891	2.418	2.554	0.12	S

Source: Field Study 2021

The result on Table 4 shows that the P-value for seven times are lesser than the stipulated level of significance at 0.05 while eleven times have p-value greater than 0.05. On this basis, the null hypothesis was retained implying that there is no significant difference in the mean response of agriculture lecturers and registered plantain farmers on the post-cultural practices in mid-rain plantain farming required by graduates of agriculture education for sustainable production in Akwa Ibom State, Nigeria.

Discussion of Result

The result of the study in Table 1 on the pre-planting cultural practices in mid-rain plantain farming required by graduates of agriculture education for sustainable production in Akwa Ibom State showed that seven of the item statements on cultural practices were required by agriculture education graduates for sustainable plantain production in Akwa Ibom State, Nigeria. The study is in line with the observation of Kelvin (2020) that planting of plantain requires field preparation to provide all the nutrients necessary for germination, grow, development and better yield. The result of the study on the planting cultural practices on mid-rain planting farming required by graduates of agriculture for sustainable production revealed that nine items were required for sustainable production. The result is in line with the findings of Ayanwale, *et al* (2016) that planting of plantain following the proper spacing, timing, positioning and others agronomic practices enhances sustainable growth and productivity. The result of the study on post-planting cultural practices in mid-rain plantain farming technology required by graduates for sustainable production, revealed that the eleven items statements on post-cultural practices listed were required by graduates of agriculture for sustainable

production. The result is in accordance with the findings of Amosun (2018) that regular fertilization, manure application and other maintenance practices increases plantain yield.

The standard deviation and the rating of the respondents were closely in their opinions on the cultural practices in mid-rain farming technology required by graduates of agriculture education for sustainable production in Akwa Ibom State, Nigeria. There was no significance difference in the mean responses of the lecturers and plantain farmers as well. The results implied that lecturers and farmers are aware of the contribution of mid-rain plantain farming cultural practices toward sustainable plantain production in Akwa Ibom State, Nigeria.

Conclusion

The understanding that the demand for plantain in Akwa Ibom State, Nigeria has gone beyond the domestic use to industrial raw materials for agro-allied industries requires sustainable production. Mid-rain plantain farming technology, which enables the cultivation of plantain at the middle of the rainy season June/July in addition to the growing season plantain farming at the beginning of rainy season April/May, is an improved plantain farming technology to ensure all year round plantain production to meet the demand.

Therefore, graduates of agriculture education could adopt the required cultural practices in pre-planting, planting and post-planting cultural practices in mid-rain plantain farming technology. To be sustainable employed in all season plantain production to meet both the domestic and industrial demand in recent times.

Recommendations

Based on the findings of the study on sustainable plantain production among graduates of agriculture in Akwa Ibom State, Nigeria. The following recommendations were made:.

1. The State Ministry of Education, in conjunction with the Ministry of Agriculture should include mid-rain farming technology in School curriculum.
2. The Ministry of Agriculture through the extension officer should organize seminar and workshop to educate graduates on mid-rain plantain farming technology to update and expand innovation technology in plantain production.
3. The registered experienced mid-rain plantain farmers should under Non-Governmental Organization (NGO) organizes workshops and field demonstration on the required cultural practices in mid-rain planting farming technology for graduates of agriculture for sustainable production.

References

Amosun, S. (2018). The Best Practices in Plantain Cultivation. A Research Report soil Health, Pomology and report in application unit, fruit and science department. National Horticultural Research Institutes (NIHORI) Ibadan.

Ayanwale, A., Oluwole, F. and Oyo, M. (2016) Innovation opportunities in Plantain Production in Nigeria. A guide book International Institution of Tropical Agriculture (ITA) www.researchgate.net

Edeghon, C. O. and Okedo-Okojie D. U. (2011). Assessment of Information Needs of Women involved in Plantain production in orhiomwon Local Government Area of Edo State Nigeria African Scientist 12(1).

Ekunwe, P.A., and Ajayi,H.I.(2010) Economics of plantain production in Edo state,Nigeria. Research Journal of Agriculture and Biological Science 6(6): 902-905.

Ibirogba, F. and Nwankwo, B., (2018).Cultivating and Marketing Plantain. The guardian Nigeria News, Business Agro News.

IITA International Institute of Tropical Agriculture (2014). A reference manual on plantain cultivation in West Africa

Kelvin, O. (2020). Everything you need know about Plantain Farming. (2019) Retrieved February 17th, 2020 www.correcting.com

Marriot J. and Lancaster, P. A., (2003). Banana and Plantain P. 85-143. In: H. T. Chan (ed). Handbook of Tropical Food, Dekker, New York.

Onwudiwe, N., Udoh, F. E., and Essien, E. N. (2016). Employability and vocational skills required university graduates for employment in fish production in Delta state. *Journal of Nigeria Association of Vocational and Technical Educators of Nigeria*.(JAVTEN) 21(1):38-46