International Journal of Economic Development Research and Investment
Volume 10, Number 3; December 2019; **ISSN: 2141-6729**
Published By:
International Centre for Integrated Development Research, Nigeria
In collaboration with:
Copperstone University, Zambia.

Skill Improvement Needs for Minisetts Yam Farmers for Sustainable Food Security in Federal Capital Territory – Abuja, Nigeria

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ABSTRACT

A survey was carried out to identify skills improvement needs for minisetts yam farmers for sustainable food security in the Federal Capital Territory – Abuja. Four hypotheses were formulated and tested to guide the study. The population comprises all the FCT College of Education and Agricultural Extension Agents in Agricultural Zone 'B; 'ADP' of the Ministry of Federal Capital Territory – Abuja. Purposive sampling technique was employed to select 100 respondents comprising 14 Lecturers from FCT College of Education and 86 Agricultural Extension Agents in Agricultural Zone 'B; 'ADP' of the Ministry of Federal Capital Territory – Abuja. Data were collected using a structured questionnaire with the titled: Skill Improvement Needs of Minisetts Yam Farmers Questionnaire (STNMYTQ). Mean and t-test statistics were used for data analysis. The finding revealed preparation skills, sprouting skills of yam minisett in nursery bed and field planting skills. The study concluded that these skills have significant effect on improved seed yam production. Hence, the improved skills identified should be used by skill acquisition centers to train farmers as out of school training programme for improved seed yam production to achieve food security, and farmers in Federal Capital Territory – Abuja should use the identified skills as improved strategies that boost the production of yam for food security in FCT – Abuja.

Keywords: *Minisett, Farmers, Yam and Food Security.*

INTRODUCTION

In Nigeria, yam is the most important staple energy food crop when compared with the other root and tuber crops such as cassava, sweet potato and cocoyam. It is an important crop of the tropics and some

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other countries in East Asia, South America and India (Iweke, in Idumah, Owombo and Ighodaro 2014). The crop contributes significantly to national economy and rural income by providing employment to many rural dwellers (Asumugba *et al* 2010) and cheap carbohydrate staple food for over 80 percent of the populace (Nwachukwu, 2018), thereby reducing poverty level (Emokaro and Law – Ogbomo, 2018). Yams are perennial herbaceous vine crops cultivated for the consumption of their starchy tubers in Asia, Africa, Central and South America, and the oceanic. The tubers themselves are also called "Yams". There are many different cultivars of yams found throughout the humid tropics. The most common economically important cultivars of yam species, widely grown in west Africa include: White yam (Dioscorea rotundata) water yam (Dioscorea alata), yellow yam (Dioscorea cayanensis), Aerial yam (Dioscorea bulbifera), Chinese Yam (Dioscerea esculenta) and Trifoliate yam (Diosconea dumetorum) (Ani, Iorkaa and Ogebe 2017).

Food security exist when all people, at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Sustainable food security is a development which meets the need of the present without compromising to ability of future generation to meet their own needs (Wikipedia, 2015). Sustainability is therefore the state of having well balanced, steady and effective use of human and material resources for total food economic independence and development of the nation (Nixon, 2015).

Efforts have been made towards improving the efficiency of the traditional technology of tuber seed yam production by developing methods that can increase the multiplication rate. One of the technologies which aim to improve on a traditional methods is known Yam minisett improved skill (YMIS) (Mignouna, Akinola, Abdoulaye and Maroya, 2017) developed by the international institute of Tropical Agriculture (IITA) to overcome the critical problem of the unavailability of good quality seed yam by improving the rate of multiplication, especially of white yam into yam sett. The need therefore existed for a method of rapidly multiplying yam planting materials; the minisett skills improvement was developed to fill the need. Yam minisett is a small piece of yam cut from a tuber (mother seed yam), which is prepared specifically for production of planting materials (Paofa, 2015). According to Oguntade Olainran and

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Ige (2014), the minisett technique is an alternative to the production of seed yam through milking of ware yam. It offers an opportunity for commercial production of seed yams. With this skills, the multiplication ratio of white yam moved to 1.10 from the traditional 1.3 (Miguouna, Akinola, Abdoulaye and Morayo, 2017).

The main purpose of the paper is to identify skill improvement needs for minisetts yam farmers for sustainable food security in Federal Capital Territory – Abuja, specially the paper seek to identify:

i. Material needed for preparation of yam minisetts
ii. The preparation skills improvement needs of yam minisetts
iii. Sprouting skills improvement needs of minisett in nursery
iv. Field planting skills improvement needs of yam minisett.

However, four hypotheses were formulated to guide the study

i. There is no significant difference in the mean ratings of Agricultural Extension Agents and Lecturers on the material needed for preparation of yam minisetts
ii. There is no significant differences in the mean ratings of Agricultural Extension Agents and Lecturers on the preparation skill improvement needs of yam minisetts.
iii. There is no significance differences in the mean ratings of Agricultural Extension Agents and Lecturers on the sprouting skills improvement needs of yam minisetts in nursery bed.
iv. There is no significant differences in the mean ratings of Agricultural Extension Agents and Lecturers on the field planting skill improvement needs of yam minisetts.

METHOD

The area of study is Federal Capital Territory – Abuja. The study employed a survey research design. This design is suitable because the researchers collected and described the characteristics or facts about the population under study. The survey design also offers research subjects the opportunity to express their opinions based on their experiences and the researchers could collect data from small sample drawn from the population in order to draw inferences. The population comprises all the Lecturers in FCT College of Education and Agricultural Extension Agents in Agricultural Zone 'B' 'ADP' of Ministry of Federal Capital Territory.

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Purposive sampling technique was used to select 14 Lecturers from FCT College of Education, and 86 Agricultural Extension Agents in Agricultural Zone 'B' 'ADP' of Ministry of Federal Capital Territory, who participated in training yam farmers in FCT. The instrument for data collection was structured questionnaire entitled "Skill Improvement Needs of Minisett Yam Farmers Questionnaire (SINMYFQ). The instrument was divided into five sections based on the research objectives. The questionnaire had restricted response options of highly needed (HN) averagely needed (AN), slightly needed (SN) and not needed (NN). These have corresponding values of 4, 3, 2, and 1. The questionnaire was validated by two experts from the department of Agricultural Education, FCT College of Education, Zuba. Both content and face validation of the instrument was done.

Data collected were analysed using descriptive statistics. Mean was used to answer the research questions. The bench mark for this was 2.50 (4+3+2+1) = 10/4 = 2.50). The small 12 fruit size was regarded as needed while any item with a mean value of less than 2.50 was regarded as not needed. Inferential statistics (t-test) was used to test the hypotheses at 0.05 level of significance. The decision rule was any cluster of the related items with a value of 0.05 and above was regarded as significant while any cluster of related items that obtained a value below 0.05 was considered not significant.

RESULTS AND DISCUSSION

Table 1 shows that all 9 items had their Agricultural Extension Agents Mean Value ranging from 2.56 to 3.10 while the Mean values of Lecturers range from 2.54 to 3.27 and were above the bench mark of 2.50. This shows that the respondents agreed that the 9 materials were needed. Materials for preparation of yam minisetts which is an indication that the respondents were not too far from one another in their responses on the material needed for preparation of yam minisetts.

Table 2 shows that all 5 items had their Agricultural Extension Agents Mean value ranging from 2.58 to 2.89 while the mean values of Lecturers range from 2.85 to 3.09 and were above the bench mark of 2.50. This shows that the respondents agreed that the 5 materials were needed for preparation of yam minisetts which is an indication that the respondents were not too far from one another in their responses. Table

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3 shows that all 7 items had their Agricultural Extension Agents Mean values ranging from 2.57 to 2.91 while the mean values of lecturers range from 2.54 to 3.18 and were above the bench mark of 2.50. This shows that the respondents agreed that the 7 items were sprouting skill improvement of yam minisett in nursery bed which is an indication that the respondents were not too far from one another in their responses on the sprouting skill improvement of yam minisett in nursery bed.

Table 4 shows that all 17 items had their Agricultural Extension Agents Mean values ranging from 2.55 to 3.67 while the Mean values of Lecturers range from 2.72 to 3.20 and were above the bench mark of 2.50. This shows that the respondents agreed that 17 items were field planting skill improvement of yam minisett which is an indication that the respondents were not too far from one another in their responses on the field planting skill improvement of yam minisett.

Test of hypothesis one reveals that the t-calculated was –6.71 which was less than t-tabulated value of 1.98 at 0.05 level of significant with 98 degree of freedom. This result is not significant. Therefore, the null hypothesis which states that there is no significant difference in the mean ratings of Agricultural Extension Agents and Lecturers on the materials needed for preparation of yam minisetts is accepted. This implies that the two groups of respondents did not significantly differ in their responses on the materials needed for preparation of yam minisetts.

Test of hypothesis two reveals that the t-calculated was – 5.37 which was less than t-tabulated value of 1.98 at 0.05 level of significant with 98 degree of freedom. This result is no significant. Therefore, the null hypothesis which states that there is no significant difference in the mean ratings of Agricultural Extension Agents and Lecturers on the preparation skills improvement needs of yam minisetts is upheld. This implies that the two group of respondents did not significantly differ in their responses on the preparation skills improvement need of minisett yam farmers.

Test of hypothesis three reveal that the t-calculated was -5.75 which was less than t-tabulated value of 1.98 at 0.05 level of significant with 98 degree of freedom. This result is not significant. Therefore, the null hypothesis which states that there is no significant differences in the mean ratings of Agricultural Extension agents and Lecturers on the sprouting skills improvement needs of yam mionisetts in nursery bed is

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accepted. This implies that the two groups of respondent did not significantly differ in their responses on the sprouting skills improvement needs of yam minisetts in nursery bed.

Test of hypothesis 4 reveals that the t-calculated was -5.69 which is less than t-tabulated value of 1.98 at 0.05 level of significance with 98 degree of freedom. This result is not significant. Therefore, the null hypothesis which states that there is no significant difference in the mean ratings of Agricultural Extension Agents and Lecturers on the field planting yam minisetts skills improvement needs is accepted. This implies that the two groups of respondents did not significantly differ in their responses on the field planting yam minisetts skills improvement needs.

This study found that 9 materials are needed for preparation of yam minisetts production. The study found no significant differences in the mean ratings of Agricultural Extension Agents and Lecturers on the materials needed for preparation of yam minisetts. The findings affirm the study conducted by Aighewi Morayo and Aseidu (2014) on seed yam production from minisetts at International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria which revealed clean and healthy 'mother' tubers, sharp knife, container (buckets, basin, plastic bag) to hold chemical treatment, net bag or basket, chemical for treatment (insecticides, fungicides and mematacde) water, stirner, gloves and protective nose guard as the most important materials needed for preparation of yam minisetts.

Also, the study found that 5 preparation skills improvement are needed in yam minisetts production. The study also found no significant differences in the mean ratings of Agricultural Extension Agents and Lecturers on the preparation skills improvement needs of yam minsetts production. The study agrees with the findings of Paofa (2015) on yam minisettts information. The study revealed that a mother seed yam should be cut into several cylindrical pieces about thumb size long (5cm) and treat minisetts in a mixture of fungicides and insecticide 100g of fungicide and 70ml of chlorpyritos in 10 litres of water then allow to dry in shock for about 12 hours.

Similarly, the study found 7 sprouting skills improvement needs in yam minisett nursery bed. The study also found no significant differences in the mean ratings of Agricultural Extension Agents and Lecturers on the sprouting skills improvement needs of yam minisetts in

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nursery bed. The findings are similar to a study carried out by Paofa (2015) on yam minisetts information. This study identified sprouting skill improvement of yam minisetts in nursery bed. The study also found out that the mini-setts are covered with moist saw dust/soil or mulch and watered regularly to keep the bed moist during dry periods and to provide cover during rainy days.

On the field planting, the study found 17 skills improvement needs. The study also found no significant differences in the mean ratings of Agricultural extension Agents and Lectuers on the field planting yam minisett skills improvement needs. The finding agree with a study by Oguntade, Olaniran and Ige (2014) on Economics of seed yam production using minisett skills improvement needs in Oyo state, Nigeria. The study reveals that the depth of 2 spade length (60cm) in loose or sandy loam soil should be used. Planting holes should be half an arm length (50cm) apart (plant spacing) place a stick at the centre of the hole for a guide and fill the holes with compost mulch and black soil until one spade length (15cm) below the mouth of the hole.

Table 1: Views of Respondents on materials needed for preparation of yam ministts (N = 100)

S/N	Item Statement	x_1	x_2	SD_1	SD_2	Remark
1.	Clean and healthy mother tubers that will Produce high yield	3.18	2.56	0.98	1.00	Needed
2.	Sharp knife for cutting the mother yam	3.27	3.01	1.00	1.05	Needed
3.	Container (bucket, basin, plastic bag) to Hold chemical treatment	3.00	2.85	0.89	1.14	Needed
4.	Net bag or basket	2.63	3.10	0.92	1.03	Needed
5.	Chemical for treatment (Insecticides, Fungicide, nematicide, nematicide)	2.54	2.84	1.03	1.02	"
6.	Water for mixing chemical mixture	2.74	2.81	1.03	1.15	"
7.	Gloves to protect the hands when treating with fungicides	2.90	2.78	1.13	1.16	"
8.	Protective nose guard to prevent inhalation of fungicides	3.00	3.00	1.26	1.03	"
9.	Stirrer used to mix chemical mixture	2.54	2.61	1.12	1.03	"
	Grand Mean		**2.86**		**2.84**	

x_1 = Mean of Lecturers, x_2 = Mean of Agricultural Extension Agents, SD_1 = Standard deviation of Lecturers and SD_2 = standard deviation for Agricultural Extension Agents.

Source: Field survey, 2019

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Table 2: Views of Respondents on Preparation Skill Improvement Needs of Yam Minisetts (N=100)

S/N	Item Statement	x_1	x_2	SD_1	SD_2	Remark
1.	Select healthy sprouted seed yams from your field or market	3.00	2.58	0.09	0.19	Needed
2.	Cut tubers into minisetts of 25 to 50gm depending on the seed size desired	2.85	2.78	0.23	0.16	"
3.	Ensure that each piece has a skin or Periderm to ensure quick sprouting	2.94	2.59	021	0.12	"
4.	Treat Minisetts in a mixture of fungicide and insecticides	3.09	2.89	1.22	0.14	"
5.	Allow to dry in shade for about 12 hours	3.00	2.77	1.09	0.14	"
	Grand Mean			**2.98**	**2.70**	

x_1 = Mean of Lecturers, x_2 = Mean of Agricultural Extension Agents, SD_1 = standard deviation of Lecturers and SD_2 = standard deviation for Agricultural Extension Agent.

Source: Field survey, 2019

Table 3: Views of Respondents on sprouting skills improvement needs of yam minisett in Nursery bed (N = 100)

S/N	Item Statement	x_1	x_2	SD_1	SD_2	Remark
1.	Prepare well drained nursery bed 100cm wide and 30cm height	2.63	2.57	1.02	1.01	Needed
2.	Spread fresh moist saw dust or sandy loam soil 2 – 3 cum thick	2.90	2.91	1.37	1.03	"
3.	Spread minisetts on the moist sawdust side by side close together	2.90	2.76	0.83	1.16	"
4.	Cover the minisetts with moist saw dust/soil or mulch	2.63	2.77	1.20	1.02	"
5.	Water regularly to keep the bed moist during dry periods and to provide cover during rainy days	2.72	2.82	1.00	0.97	"
6.	Observe to ensure that minisetts sprout within 3 – 4 weeks	3.18	2.65	0.98	1.10	"
7.	Transplant minisetts soon as sprouting occurs but when true leaves are not yet developed	2.54	2.65	1.03	0.98	"
	Grand Mean			**2.67**	**2.79**	

x_1 = Mean of Lecturers, x_2 = Mean of Agricultural Extension Agents, SD_1 = standard deviation of Lecturers and SD_2 = standard deviation for Agricultural Extension Agent.

Source: Field survey, 2019

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Table 4: Views of Respondents on Field Planting skill improvement needs of yam minisett

S/N	Item Statement	x_1	x_2	SD_1	SD_2	Remark
1.	Plough and prepare the field ready for planting	2.90	2.95	1.04	0.98	Needed
2.	Avoid bruishing and damage during transplanting	2.90	2.76	0.83	0.05	"
3.	Direct planting of minisetts should be done only when the rainy season is fully established	3,18	2.82	1.98	1.00	"
4.	Plant minisetts in well prepared mounds or Ridges with the skin section placed in firm contact with the soil at a spacing of 25 x 100cm and about 10cm deep to give 40,000 stands/ha	2.81	2.84	0.98	0.98	"
5.	Double row planting with 25cm intra – row on ridges spaced 1m apart to give80,000 stands/ha	3.00	3.67	1.89	1.04	"
6.	Handle minisetts carefully to avoid damage to young sprouts during transplanting	3.02	2.69	1.98	1.02	"
7.	Transplant when sprouts are still short and have not elongated into vines or produced broad leaves	3.09	3.19	1.94	1.10	"
8.	Plant minisetts as soon as possible after they leave the nursery to reduce trans-planting shock	3.10	2.55	0.94	0.13	"
9.	Dig holes of one arm's length deep (10m) and one spade length wide (30cm) for clay loam soils	2.72	3.06	1.90	1.04	"
10.	Use a depth of 2 spade lengths (60cm) in loose or sandy loam soil	2.90	2.71	1.04	0.01	"
11.	Planting holes should be half an arm length (50cm) apart (plant spacing)	3.18	2.67	0.98	0.01	"
12.	Place a stick at the center of the hole for a guide and fill the holes with compost mulch and black until one space length (15cm) below the mouth of the hold	3.09	2.97	0,94	0.11	"
13.	Remove the stick and placed sprouted minisett on top of the mulch/compost and soil and with the minisett sitting in the center of the hole where the stick was placed	3.20	3.39	1.98	1.09	"
14.	Cover the planted portion with top soil then water to supply moisture	2.72	2.68	0.10	0.12	"
15.	Use sandy loam soils where saw dust is not available	2.73	2.78	0.50	0.15	"
16.	Sterilize (cooked) the soil before using it to prevent disease infestation	3.00	3.66	1.00	1.15	"
17.	Use dry grass as mulch to keep soil moist	3.18	3.29	1.88	1.98	"
	Grand Mean	**2.99**	**2.96**			

x_1 = Mean of Lecturers, x_2 = Mean of Agricultural Extension Agents, SD_1 = standard deviation of Lecturers and SD_2 = standard deviation for Agricultural Extension Agent.

Source: Field survey, 2019

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Table 5: t-test Result of Agricultural Extension Agents and Lecturers on the materials needed for preparation of yam minisetts

Variable	N	Mean	std. Dev.	Df	t-cal	t-tab	Remark
Ext. Agents	86	2.80	0.67	98	-6.71	1.98	NS
Lecturers	14	2.79	0.46				
Total	**100**						

Source: Field survey, 2019

Table 6: t-test Result of Agricultural Extension Agents and Lecturers on the preparation skills improvement need of yam minisett.

Variable	N	Mean	std. Dev.	Df	t-cal	t-tab	Remark
Ext. Agents	86	2.67	0.83	98	-5.37	1.98	NS
Lecturers	14	2.79	0.47				
Total	**100**						

Source: Field survey, 2019

Table 7: t-test Result of Agricultural Extension Agents and Lecturers on the sprouting skills improvement needs of yam minisetts in nursery bed

Variable	N	Mean	std. Dev.	Df	t-cal	t-tab	Remark
Ext. Agents	86	2.96	0.79	98	-5.75	1.98	NS
Lecturers	14	2.66	0.46				
Total	**100**						

Source: Field survey, 2019

Table 8: t-test Result of Agricultural Extension Agents and Lecturers on the field planting skills improvement needs of yam minisetts.

Variable	N	Mean	std. Dev.	Df	t-cal	t-tab	Remark
Ext. Agents	86	2.990	0.81	98	-5.67	1.98	NS
Lecturers	14	2.96	0.46				
Total	**100**						

Source: Field survey, 2019

CONCLUSION

The main purpose of the survey was to identify the skill improvement needs for minisetts yam farmers for sustainable food security in Federal Capital Territory – Abuja. Four hypotheses were formulated and tested for significance. The study has identified the materials needed for

preparation of yam minisetts and skills improvement that could be used for yam minisett production. These skills improvement have significant effect on improved seed yam production.

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